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Determinants of Capital Structure: A Study on Some DSE Listed Corporate Firms in Bangladesh

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Abstract

Capital structure is the mix of debt and equity that the company uses in its operation (Modigliani and Miller, 1958). Debt comes in the form of bond issues or long-term notes payable, while equity *is classified as common stock, preferred stock or retained earnings. Factors such as like tangibility of Assets, non-debt tax shield, profitability, size, and growth opportunity of the firm are the major determinants of capital structure (Sasho and Akelsander, 2016). The purpose of this paper is to study the relationship between the independent variables (tangibility of Assets, non-debt tax shield, profitability, size, and growth opportunity) and dependent variable (leverage). In the present study, different multiple variables are used to take convenient capital structure decision of 17 DSE listed corporate firms operating in Bangladesh, dividing into four sectors i.e. Pharmaceuticals and chemicals, Tannery, Cement* and Ceramic *sectors. This Study follows quantitative research method. This research was conducted during the period of 2010-2016. It has been found tangibility of assets, non-debt tax shield and growth opportunities have positive relation with leverage. In contrast, size shares significant negative relation with leverage. Profitability has negative relation with leverage but the result is not statistically significant. Thus, it can be said that tangibility of assets, non-debt tax shield, growth opportunity and size of the firm are the major determinants of the capital structure of the DSE listed corporate firms.*

Key words: Capital structure, Leverage, tangibility, tax, Growth Rate, DSE.

Introduction

The capital structure decision of a corporation is a controversial issue at present. There must be a balanced proportion of debt and equity in the

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capital structure. After Modigliani and Miller had set the basis of the capital structure theory in their seminal paper from 1958, extensive research in this field emerged, aimed at supplementing their findings. How do firms choose their capital structures? In his answer to this question, Prof. Stewart C. Myers, then President of American Finance Association in 1984 said that "we don't know". Despite decades of intensive research, and hundreds of papers after Modigliani and Millers' seminal work, surprisingly there is lack of consensus even today among the finance experts on this basic issue of corporate finance. In practice it is observed that finance managers use different combinations of debt and equity. Academicians and practitioners alike have found it difficult to find out how a firm decides its capital structure in the perfect capital markets of the west as well as in the imperfect capital markets, as in Bangladesh. This has led to an upsurge in research on company finance, particularly aimed at understanding how companies finance their activities and why they finance their activities in these specific ways.

This paper undertakes study of firm level data of 17 major companies listed in DSE, taken from different sectors and attempts to identify main determinants of capital structure for the period 2010 to 2016 in the light of the above mentioned theories. The research question to be investigated is: What determines the capital structure in Bangladeshi companies? Efforts will be made to find out the factors that determine the financing pattern of capital structure of Bangladeshi companies, particularly in the private sector. Objectives of the research question are to: identify factors considered by companies before making financing decisions, to see how these factors affect the firm's capital structure.

Theoretical Framework

Concept of Capital Structure

The capital structure decision of a corporation is a controversial issue at present. There must be a balanced proportion of debt and equity in the capital structure. Over the past several decades, theories on a company's capital structure decision have evolved in many directions. Capital structure is a mix of long-term debt (including bonds and loans), equity (common and preferred stock) and hybrid securities (such as convertible debt and preferred shares). In other words, it refers to the percentage of capital at work in a business by type. Capital structures would depend on the interaction of demand side variables given by the trade-off and the pecking order theory and the supply side variables of investors' taste and limited financial intermediation. Therefore, it can be said that the financing decision of a firm would be governed by both demand and supply side factors. The optimal debt-equity mix is explained by a number of capital structure theories. Corporations' funds their operations

by raising capital from a variety of distinct sources. The mix between the various sources is generally referred to as the firm's capital structure.

Determinants of Capital Structure

Tangibility of Assets, non-debt tax shield, profitability, size, and growth opportunity of the firm are the major determinants of capital structure (Sasho and Akelsander, 2016).Therefore, this study have used relevant variables which consider Leverage (D/E ratio) as the dependent variable, and Tangibility of Assets, non-debt tax shield, profitability, size, and growth opportunity as the independent variables.

Anshu Handoo & Kapil Sharma (2014) found that factors such as profitability, growth, asset tangibility, size, cost of debt, tax rate, and debt serving capacity have significant impact on the leverage structure chosen by firms. The most commonly used alternative is the *total leverage* as a ratio of total liabilities to total assets. Firms with higher tangible assets are expected to have higher leverage. Marsh (1982) and Walsh and Ryan (1997) find significant positive relationship between tangibility and leverage Tax has an immense relationship with the capital structure of a firm. A firm has high non-debt tax shield is expected to possess low amount of debt content in its capital structure. Titman and Wessels (1988) found that profitability is one of the major determinants of the US firms and projected a negative relationship between leverage and profitability. A number of studies have suggested that leverage ratios may be related to the firm size. According to the study of Marsh (1982) large firms are able to take the advantages of economies of scale in issuing long term debt because of its bargaining power. Several studies suggest that firms with higher growth can expect to have lower amount of leverage in their capital structure. Evaluation of optimal leverage varies among literatures.

Literature Review

The debate on determining the ideal capital structure and value of firms can be traced back to Modigliani and Miller (1958) who in their research concluded that the value of the firm is self-determining of capital structure and that the value of an unlevered firm is equal to that of a levered firm. The research was based on the assumption of absence of taxes. This assumption was considered unrealistic and in heir subsequent research Modigliani and Miller (1963) took tax into consideration and concluded that because of tax shield on debt as a factor, the value of a levered firm was more than the value of an unlevered firm and that this value was equal to the value of the tax shield. Modigliani and Miller (1977) later modified their earlier research on1963 and incorporated the effect of personal taxes. Personal Taxes were classified into two

categories, tax on income from holdings shares and tax on income from debt securities. In this research (1977), Modigliani and Miller identified certain special cases where gain from leverage became zero, giving the original (1958) result. Thus their results signify the existence of an optimal capital structure at the macro level but not at the micro level.

Anshu Handoo & Kapil Sharma (2014) found that factors such as profitability, growth, asset tangibility, size, cost of debt, tax rate, and debt serving capacity have significant impact on the leverage structure chosen by firms in the Indian context.

The findings on the capital structure in the transitional economies are probably best enveloped by Delcoure (2007). She asserts that none of the known theories provides a satisfactory explanation of the debt-equity choice in these countries. Mostly as a result of corporate governance related factors, the companies from these countries follow some kind of a "modified pecking order" in the selection of financing choices. The theoretical considerations and prior empirical evidence with regard to each of the independent variables are discussed as under:

Tangibility of Assets

Firms with higher tangible assets are expected to have higher leverage. Firms can borrow money from the market or third parties against collateral security and collateral value may be a major determinant of the level of debt finance available to companies (Scott, 1977; Williamson, 1988; Harris & Raviv, 1990; Wald, 1999). Chittenden et al (1996) and Bevan and Danbolt (2002) find a relationship between tangibility and gearing depending on the measure of debt applied. According to their studies, tangibility is positively related with long term dent element but negatively with short-term debt. In the present study tangibility can be calculated with the help of the following formula:

Tangibility*= Fixed Assets/ Total Assets.*

Non-Debt Tax Shield

Tax has an immense relationship with the capital structure of a firm. Daley and Huber (1982) conducted a study of cross-industry differences in financial leverage and found that non-debt tax shield has a significant relation with capital structure at the industry level. But the empirical study shows some mixed result for this relationship. Bradley *et al* (1984), Campbell and Jerzemowska (2001) shows positive relation between non-debt tax shield and leverage. Chaplin sky and Niehaus (1993), Wald (1999), Gajdka (2002) find that non-debt tax shield has a negative relation with leverage of the capital structure. In the present study non-debt tax shield can be calculated with the help of the following formula:

Non Debt Tax Shield *= Total Depreciation Charges/Total Assets*

Profitability

Since most of the studies have shown that the more profitable companies need less additional funding (pecking order theory) (Bauer, 2004; Avarmaa et al., 2011; Kędzior, 2012). Titman & Wessels (1988) define the variable by the operating profit on the sales or operating income on the assets. Sayilgan et al (2006), Rajan & Zingales (1995) and Myers (1984) define the variable for the return on assets (ROA, calculated by the ratio of EBIT over total assets). At this paper is used the profitability variable

Profit ability *i,t = EBITi,t / Total Assetsi,t, of the company i in year t*

Size

The size of the companies is an indicator commonly used to explain the levels of debt and the ability of companies to obtain new financing on the market. Large companies have more stability, less volatility in cash flow and can exploit economies of scale (Gaud et al, 2005 and Graham et al, 1998).The larger companies can get lower financing costs because they presented a lower risk of failure and the size is a good *proxy* for the probability of default (Rajan & Zingales, 1995). In the research have been used different indicators to represent the companies' size, the logarithm of net sales (Cortez & Susanto, 2012; Sayilgan et al, 2006; Gaud et al, 2005)

Size *= Log (Sales)*

Growth Opportunities

The expected relation between growth and leverage is ambiguous. Several studies suggest that firms with higher growth can expect to have lower amount of leverage in their capital structure. According to Baskin (1989), trade-off theory would suggest a negative sign for this variable because higher growth is associated with greater bankruptcy risk. This implies that a positive sign is more consistent with pecking order theory. As per the study of Jensen and Meckling (1976), Smith & Warner (1979) and Green (1984) when the firm issues convertible debt the agency costs will be reduced. This suggests that there may be positive relation between convertible debt ratios and growth opportunities. According to Myres (1977), high-growth firms may hold more real options for future investment than low- growth firms. In this study the percentage changes in the total assets are taken to determine the growth opportunity. In some cases, the Tobin's Q is used as a proxy for the growth opportunities (Okuda and Nhung, 2012) or the growth rate of the sales in the last few years (Črnigoj and Mramor, 2009; Kędzior, 2012).

Growth Opportunity*= Percentage Change in Total Assets.*

Leverage (Debt/Equity Ratio)

This is a dependent variable with a key role in the model. The most commonly used alternative is the *total leverage* as a ratio of total liabilities to total assets. It is based on the broadest definition of debt and reflects the general division of the sources of financing between equity and borrowed funds. Another option is the *total debt* to total assets ratio. The study use total debt ratio as the dependent variables. No such studies in Bangladesh have examined the determinants of total debt ratio of the firms before. Thus, this study has improved the previous studies by attempting to determine the factors of total debt ratio of Pharmaceuticals and Chemicals, Tannery, Cement, and Ceramics Industries in Bangladesh.

Hypothesis

On the basis of the reviewed literature the following hypotheses have been formulated:

1. Asset tangibility has no significant effect on leverage.
2. Asset tangibility has significant effect on leverage.
3. Non-debt tax shield has no significant effect on leverage.
4. Non-debt tax shield has significant effect on leverage.
5. Profitability has no significant effect on leverage.
6. Profitability has significant effect on leverage.
7. Size has no significant effect on leverage.
8. Size has significant effect on leverage.
9. Growth opportunity has no significant effect on leverage.
10. Growth opportunity has significant effect on leverage.

Objectives of the study

The main objective of the paper is to study the relationship among different individual factors like tangibility of assets, non-debt tax shield, profitability, size, and growth opportunity with leverage on some DSE listed corporate firms.

Sub objectives of the study are the followings.

a. To examine the effect of tangibility on leverage of capital structure of some DSE listed corporate firms.
b. To examine the effect of non-debt tax shield on leverage of capital structure of some DSE listed corporate firms.
c. To examine the effect of profitability on leverage of capital structure of some DSE listed corporate firms.
d. To examine the effect of size on leverage of capital structure of some DSE listed corporate firms.
e. To examine the effect of growth opportunity on leverage of capital structure some DSE listed corporate firms.

f. To suggest some determinants which are of considerable attention for capital structure decision of different company operating in Bangladesh and listed in DSE.

Methodology of the Study

Data and Sources of Data

This study is predominantly empirical in nature and based on secondary data. Data are collected from secondary data sources like website of Dhaka stock exchange (www.dsebd.org), Bangladesh Security and exchange commission (www.bsecbd.com), Prospectus and annual report of different companies in Bangladesh, and various journals.

This research study is based on the data taken from the Central Bank of Bangladesh publication "Balance sheet analysis of companies listed on the Dhaka stock exchange Volume-I and Volume-II 2010-2016". The research initially includes 17 listed companies on DSE. Time period of the data is from 2010 to 2016. The sample of 17 DSE listed companies classified under four sectors – Pharmaceuticals and Chemicals, Tannery, Cement, and Ceramic Sector. Any companies showing outlier data are excluded from the sample. Samples are selected through random sampling technique.

Table 1: Identification of independent Variables

Code	Items	Source
V1	Tangibility of Assets	Anshuand Kapil 2014,Bevan and Danbolt (2002),Scott, 1977, Williamson, 1988; Harris &Raviv, 1990; Wald, 1999)
V2	Non-debt tax shield	Sheridan And Roberto 1998, Chaplin sky and Niehaus (1993), Wald (1999), Gajdka (2002)
V3	Profitability	Sayilgan et al (2006), Rajan&Zingales (1995) and Myers (1984)
V4	Size	Cortez &Susanto, 2012; Sayilgan et al, 2006; Gaud et al, 2005
V5	Growth opportunity	Baskin (1989), Green (1984)

Source: *Literature Survey*

Table 2: Identification of dependent Variable

Code	Items	Source
L	Leverage	Anshuand Kapil 2014, MZ &Goyal, 2007, Cotei and Farhat 2009

Data Analysis Tools

In the present study SPSS is used to conduct the correlation and regression analysis.

Pearson Correlation coefficient is used to find out the relationship between leverage and individual variables. The variables used in the study are quantitative variables.

Regression analysis is used as a method to find out which of the independent variables (tangibility, non-debt tax shield, profitability, size, and growth opportunity) affecting the dependent variable leverage of capital structure were significant with respect to predicting the most influential capital structure determinants. Regression analysis is conducted to reveal the linear relationship between leverage and other independent variables of the company. The variables (ratios) are retained in the regression model on the basis of high t value ($|t|>2$) and low p-value ($p<0.05$).

Analysis and Findings

Table 3 (Correlation between Leverage and Other Individual Variables) shows the correlation among the different variable in the study. The dependent variable leverage shares a significant positive correlation with tangibility (r=0.715, sig=0.020) growth opportunity (r= 0.656, sig= 0.039) and non-debt tax shield (r=0.628, sig=0.17) but has a significant negative relation with the size of the firm (r= -0.831, sig=.003). The other variable profitability share negative relation with the variable leverage but the relation is not statistically significant.

Test of Hypothesis

1. Asset tangibility has no significant effect on leverage.
2. Asset tangibility has significant effect on leverage.

In this case both the variables leverage and tangibility are continuous variables. At the significant level of 0.05, we found that |t|-value > 2 (t-value 2.893) and p-value=.020 **Table 4 (Regression Analysis of Leverage and Tangibility)**which is less than 0.05. Hence, we can reject the null hypothesis and accept that Asset tangibility has significant effect on leverage in the selected sample DSE listed corporate firms.

1. Non-debt tax shield has no significant effect on leverage.
2. Non-debt tax shield has significant effect on leverage.

In this study both the variables leverage and non-debt tax shield are continuous variables. At the significance level of 0.05, we found that |t|-value > 2 (t-value 2.280) and p-value=.017**Table-5(Regression Analysis of Non-Debt Tax Shield and Leverage)**. Hence, we can reject the null hypothesis and accept that Non-debt tax shield has significant effect on leverage in the selected sample DSE listed corporate firms.

1. Profitability has no significant effect on leverage.
2. Profitability has significant effect on leverage.

In this case both the variables leverage and profitability are continuous variables. At the significance level of 0.05, we found that |t|-value < 2 (t-value -0.940) and p-value=0.375 **Table-6 (Regression Analysis of Profitability and Leverage)**. Hence, we can accept the null hypothesis in this case on the basis of significance level because p-value exceeds the significance level of 0.05. Therefore, it can be said that Profitability has no significant effect on leverage in the selected sample DSE listed corporate firms.

1. Size has no significant effect on leverage.
2. Size has significant effect on leverage.

In this case both the variables leverage and size are continuous variables. At the significant level of 0.05, we found that |t|-value > 2 (t-value -4.224) and p-value=.003 **Table-7(Regression Analysis of Size and Leverage).** Hence, we can reject the null hypothesis and accept that there is significant negative relation between size of the firm and leverage in the selected sample DSE listed corporate firms.

1. Growth opportunity has no significant effect on leverage.
2. Growth opportunity has significant effect on leverage.

In this case both the variables leverage and growth opportunities are continuous variables. At the significant level of 0.05, we found that |t|-value > 2 (t-value 2.462) and p-value=.039 **Table-8(Regression Analysis of Growth Opportunity and Leverage)** which is less than 0.05. Hence, we can reject the null hypothesis and accept that Growth opportunity has significant effect on leverage in selected sample DSE listed corporate firms.

Conclusion

The primary objective of the paper is to study the relationship between the independent variables (tangibility of Assets, non-debt tax shield, profitability, size, and growth opportunity) and dependent variable (leverage) and to understand the factors that determine the capital structure of selected sampled DSE listed corporate firms. In the present study, different multiple variables are used to take convenient capital structure decision of 17 DSE listed corporate firms operating in Bangladesh, dividing into four sectors i.e. Pharmaceuticals and chemicals, Tannery industries, Cement sector, Ceramics sector by applying regression analysis. For this purpose, independent variables were considered to measure the effect on the leverage (dependent variable) position of the company. With the help of regression analysis it is found that tangibility of assets, non-debt tax shield and growth opportunity have positive relation with leverage. In contrast, size shares significant negative relation with leverage. Profitability has negative

relation with leverage but the result is not statistically significant. Thus, it can be said that tangibility of assets, non-debt tax shield, growth opportunity and size of the firm are the determinants of the capital structure of DSE listed corporate firms operating in Bangladesh. Therefore, it can be said that companies with lower level of tangible assets are more subject to information asymmetry problems among the stakeholders, and consequently, more willing to use debt to finance their activities. In contrast, it is found that profitability has no effect on capital structure decision for 17 DSE listed corporate firms operating in Bangladesh.

References

Akhtar, S. (2005). The determinants of capital structure for Australian multinational and domestic corporations Australian journal of management, 30(2), 321-341.

Bevan, A.A., Danbolt, J. (2002), "Capital Structure and its Determinants in the United Kingdom-A decomposition Analysis", Applied Financial Economics, 12(3): 159-170.

Campbell, K., and Jerzemowska, M. (2001), "Capital Structure Decisions Made by Companies in a Transitional Economy"

D. Zarecki (Ed.). Financial Management, Objectives-Organisation-Tools (51-76) Companies in Vietnam: An Estimation of the Influence of Government Ownership",

Delcoure, N. (2007) "The determinants of capital structure in transitional economies", International Review of Economics & Finance, Vol. 16, No. 3, pp.400–415, doi:10.1016/j.iref.2005.03.005.

H and Kucukkocaoglu, G (2006), "The Firm-Specific Determinants of Corporate Capital Structure: Evidence from Turkish Panel Data", Investment Management and Financial Innovations, 3, 125-139;

Handoo, A & Sharma, K, A study on determinants of capital structure in India, IIMB Management Review (2014), xx, 1-13

Harris, M., Raviv, A. (1991), "The Theory of Capital Structure", Journal of Finance, 46(1): 297-355.International Journal of Business and Information, Vol. 7, No. 2, pp. 137–163.

Jong, AD, Kabir, R and Nguyen, TT 2008, "Capital structure around the world: Theroles of firm- and country-specific determinants", Journal of Banking &Finance,vol. 32,pp.13-20.

Kędzior, M. (2012) "Capital structure in EU selected countries – micro and macro determinants", Argumenta Oeconomica, Vol. 28, pp. 69–117.

Mayer, C. (1990). Financial systems, corporate finance and economic development. In R. G. Hubbard (Ed.), Asymmetric information, corporate finance, and investment. Chicago, Ill: University of Chicago Press.

Modigliani F and Miller H, (1958), "the Cost of Capital, Corporation Finance and the Theory of Investment", American Economic Review Pp. 261-297.

Modigliani, F and Merton HM 1958, "Corporate Income Taxes and the Cost of Capital: A Correction", American Economic Review, vol. 53, pp. 433-443.

Myers S (1977), "Determinants of Corporate Borrowing", Journal of Financial Economics, 9, Pp 147-176.

Okuda, H., Nhung, L. T. P. (2012) "Capital Structure and Investment Behavior of Listed

Sayilgan, G; Karabacak,

Scott, J. (1977), "Bankruptcy, secured debt and optimal capital structure", Journal of Finance, 32(1):1-19.

Titman, S and Wessells, R (1988), "The determinants of capital structure choice", The Journal of Finance, 43, 1-19;

Wald, J. K. (1999), "How firm characteristics affect capital structure: an international comparison", Journal of Financial Research, 22(2): 161-187.

Bangladesh Security and exchange commission (www.bsecbd.com), Prospectus and annual report of different companies in Bangladesh, and various journals.

Scott, J. (1977), "Bankruptcy, secured debt and optimal capital structure", Journal of Finance, 32(1):1-19.

Titman, S and Wessells, R (1988), "The determinants of capital structure choise", The Journal of Finance, 43, 1-19;

Wald, J. K. (1999), "How firm characteristics affect capital structure: an international comparison", Journal of Financial Research, 22(2): 161-187.

Central Bank of Bangladesh publication "Balance sheet analysis of companies listed on the Dhaka stock exchange Volume-I and Volume-II 2010-2016"

Bangladesh Security and exchange commission (www.bsecbd.com), Prospectus and annual report of different companies in Bangladesh during the period of 2010-2016, and various journals.