Impact of Firm Specific Factors on Capital Structure Decision: An Empirical Study of Bangladeshi Companies

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Abstract

This study attempts to explore the impact of firm specific factors on capital structure decision for a sample of 39-firm listed on Dhaka Stock Exchange (DSE) during 2003-2007. To achieve the objectives, this study tests a null hypothesis that none of the firm's specific factors namely profitability, tangibility, non-debt tax shield, growth opportunitiy, liquidity, earnings volatility, size, dividend payment, managerial ownership, and industry classification has significant impact on leverage using estimate of fixed effect model under Ordinary Least Square (OLS) regression. Checking multicollinearity and estimating regression analysis through Pearson correlation and autoregressive model respectively this study found that profitability, tangibility, liquidity, and managerial ownership have significant and negative impact on leverage. Positive and significant impact of growth opportunity and non-debt tax shield on leverage has been found in this study. On the other hand size, earnings volatility, and dividend payment were not found to be significant explanatory variables of leverage. Results also reveal that total debt to total assets ratios are significantly different across Bangladeshi industries.

Keywords: Capital Structure, Leverage, Firm's Specific Factors, Dhaka Stock Exchange, Bangladesh.

1. INTRODUCTION

The theories of capital structure are the most attractive and complicated issue in the field of finance. Relating to capital structure two sides are frequently focused in finance that are the impact of capital structure on firm's value that is pertinent to optimal capital structure and the determinants of capital structure of firms. Decision making in capital structure is very much susceptible issue to all firms due to its internal and external effects on firms. One of the many objectives of financial managers is to maximize the wealth of the firm, more specifically shareholder's wealth maximization. To maximize firm's value as well as minimize the cost of fund, a manager should set up an optimal capital structure. The fundamental components in capital structure are debt and equity. A firm should attempt to determine the optimal capital structure that causes the maximization of firm's value. Positive relationship between leverage and value of the firm has been identified in some studies (Champion, 1999; Ghosh et al, 2000; Chowdhury S. & Chowdhury A., 2010). Capital structure policy is also important in a sense that level of risk and return of a firm is mostly affected by it. Using more debt in capital structure to finance firm's assets results in increase the variability of firm's cash flows stream more specifically it leads to generate higher risk consequently, to compensate the higher risk stockholders expect a higher rate of return to firm. But no strict theory has been developed yet to determine the exact optimal capital structure. So it concerns managers in identifying some factors influencing capital structure decision by which they can benefit to make an optimal mix of debt and equity to maximize firm's value. Moreover these factors vary across countries and firm's characteristics i.e. size of firm,

agency costs, bankruptcy costs, profitability, growth opportunity, variability of earnings, liquidity, assets structure, ownership structure, etc. Since Modigliani and Miller (1958), who are the pioneer in this field, executed an instructional research in identifying the determinants of capital structure. Thereafter, many researches have been conducted in the developed country such as Rajan and Zingales (1995) (the G-7 countries), Akhtar (2005) (Australia), and Akhtar and Oliver (2009) (Japan).

As a developing country Bangladesh has become an emerging market with a lot of potential of investment that gets an attention for investors and managers to rethink about the influencing factors of using debt and their extent of influence over firms. Although there have been small numbers of research in Bangladesh focusing on the primary determinants of capital structure such as Chowdhury MU. (2004), Lima M.(2009) , and Sayeed M.A. (2011), there is still disagreement regarding which factors have significant impact in determining a firm's capital structure. Nevertheless, an important factors affecting capital structure determination of a firm in developed country may not be equally important to a firm in developing country like Bangladesh. Furthermore, all possible factors affecting capital structure decision have not been considered in a research at a time and that is why some factors are still important to further use in measuring their impact on capital structure determination and there is a need to bridge between current study and capital structure theory.

This study extends the existing literature by analyzing the factors affecting capital structure decision on 39 listed companies in the Dhaka Stock Exchange by using the panel data models over the periods 2003-2007. This study is different from others because it considers some firm's specific factors that have not been used yet in Bangladesh. This study attempts to analyze the impact of firm specific factors on capital structure decision in a systemic manner and provides practical and applicable guideline for any one who wants to have insight of the topic. Therefore, this study provides further evidence of the capital structure theories pertaining to a developing country.
The remaining part of this paper is organized as follows. Section 2 shows some predictions associated with major leverage theories. Section 3 provides insights to recognize capital structure and its empirical determinants. The objectives of the study are addressed in section 4. Hypotheses of the study, that are to be tested, are presented in section 5. Chapter 6 summarizes the methods and methodology of the research. Data analysis and interpretation of results are presented in section 7. Conclusions and recommendations for further analysis are discussed in section 8 followed by references.

2. THEORETICAL DISCUSSION ON CAPITAL STRUCTURE
To represent and examine the possible determinants of leverage requires some theoretical platform. The importance of making a decision relating to the capital structure decision was firstly introduced by the article published by Modigliani and Miller (MM) in 1958 where they proved that, in a world of no taxes, the firm's value is unaffected by the debt to equity ratio. Following the pioneering works of MM in this field, many critical studies have been made about the assumptions made by MM. In fact, the MM theory does not crystallize the definition on how a company should finance its assets to enjoy the benefits of optimal capital structure and also it does not explain the empirical findings on capital structure very well. Then, after such criticisms, they reviewed their capital structure theory including corporate tax factor in and excluding dividends from the model and published the new article in 1963. Then, in 1977, Miller published another article and included corporate tax and individual income tax in their models. According to MM theory, an optimum capital structure is subject to tax advantages of debt and that is why firms should have a capital structure almost totally composed of debt. But in the real world, firms generally assume to use moderate amounts of debt due to its high bankruptcy costs. After MM theorem, three fundamental theorems have been developed on capital structure. These are Static Tradeoff Theory, Pecking Order Theory and Agency Cost Theory.

Jensen and Meckling (1976) are the pioneers in introducing the agency theory. Agency theory suggests that the managers (agent) are given authority by the shareholders (the principal) to

manage the firm in a way by which firm's welfare and shareholder's wealth are maximized. In particular, the managers do not always act in the interest of the shareholders in which the managers can adopt an opportunistic behavior and benefit them from achieving their own selfishness that may put the firm at risk. Eventually, achieving the goal of maximizing the value of the firm often becomes unattainable. Such a conflict of interest will create agency problems and costs. According to Jensen and Meckling (1976), an individual will work harder for a firm if he/she owns a large percentage ownership of the company than if he/she owns a small percentage. However, when managers hold a significant portion of a firm's equity, an increase in managerial ownership may lead to an increase in managerial opportunism and therefore may cause lower debt. Moreover, Jensen and Meckling (1976) argue that managers avoid leverage to reduce the risk of corporate bankruptcy and transfer of control to bondholders. The loss to managers from bankruptcy is potentially greater when managers hold larger ownership. Grossman and Hart (1982) suggest that the use of debt increases the chances of bankruptcy and job loss that further motivate managers to use the organizational resources efficiently and reduce their consumption on perks.

M. Jensen (1986) develops the **free cash-flows theory** to limit the managerial discretion. He defines the free cash-flows as the sum of the cash available to the managers after the financing of all the projects with a positive NPV. It concerns Jensen that the managers with ample free cash flow may be tempted to plow too much cash into mature business or ill-advised projects. If it is treated as problem, then it can be solved by either using more debt or paying more dividends. Even a firm can apply both policies concurrently. According to this theory debt reduces free cash flows, because the firm must make interest and principal payments. Furthermore, an increase in dividends should benefit the stockholders by reducing the ability of managers to pursue wasteful activities.

The **signaling theories** are initially developed by Ross (1977). According to Ross, managers often use capital structure as a signal of firm to investors. Ross assumes that managers (the insiders) know the true distribution of firm returns, but investors do not. If managers decide to add more debt into capital structure, investors interpret it as a signal of high future cash flows and a firm's commitment towards its contractual obligation. Thus, this shows higher level of confident to the public sentiment that lead them to think that the firm has delightful prospects in the near future. However, if managers decide to finance the firm by issuing new equity, it signals that firm has unfavorable prospects and attempt to raise new investors to share the losses. Accordingly, he concludes that investors take larger levels of debt as a signal of higher quality.

Trade-off theory (Scott, 1977) claims that a firm's optimal debt ratio is determined by a trade-off between advantages of using debt (tax deductibility of interest payments) and its disadvantages (cost of bankruptcy). Higher profitability of a firm decreases the expected costs of financial distress and let the firm increase their tax benefits by raising leverage. Furthermore, a firm with large investment in tangible assets will have smaller costs of financial distress than a firm relies on intangible assets. This theory suggests that firms would prefer debt financing over equity until the point at which the bankruptcy probability is equal to the tax advantage of using debt.

The **Pecking Order theory** (POT) was first initiated by Myers and Majluf (1984). According to this theory, a firm does not follow a target amount of leverage. Each firm chooses its leverage ratio based on financing needs. Firms first fund projects out of retained earnings. If retained earnings are not sufficient, the firms go for debt and if further financing is required, they issue equity. The retained earning is preferred over debt and equity because it almost has no cost, but if the external resources are used for financing like issuance of new shares it may take very high cost. Profitable firms generate cash internally and end up relying on less debt. Because the Pecking Order Theory is based on the difficulties of obtaining financing at a reasonable cost, a cynical investor thinks that a stock is overvalued if the managers try to issue more of it, thereby stock price is expected to fall.

3. CAPITAL STRUCTURE AND EMPIRICAL FACTORS AFFECTING CAPITAL STRUCTURE DECISION

3.1 Capital Structure
In this analysis, the capital structure is dependant variable and it is measured by total leverage that is the ratio of total debt to total assets. Total debt contains both long term debt and short term debt. It is argued by Harris and Raviv (1991), Rajan & Zingales (1995), Hung and Song (2006), Chen (2003), and Buferna, et al. (2005).

3.2 Firm Specific Factors Affecting Capital Structure Decision (Leverage)
3.2.1 Profitability
According to the pecking order theory, a profitable firm is more likely to finance from internal sources rather than external sources. More profitable firms are expected to hold less debt because they are able to generate adequate funds easily and cost effectively from internal sources for satisfying project's cost that shows an inverse relation between profitability and leverage. A negative relation between profitability and leverage is found in Rajan and Zingales (1995), Supanvanij (2006), Sayilgan et al. (2006) and Sheikh & Wang (2010). Sayeed M.A. (2011) found profitability is irrelevant in determining capital structure. On the other hand, the high ability of paying debt's obligations which is, in general, mostly considering factor to all lenders is often subject to firm's profitability that ultimately measures the firm's tolerable level of debt. It is argued that the more profitable companies can easily add more debt in their capital structure. Jensen (1986) shows that firms with more likelihood of agency problem use more debt to reduce availability of free cash flows at manager's hand so that managers can be restrained from bad investment decision. However, the trade-off theory, signaling theory, and agency cost theory support a positive relation between profitability and leverage. Following Rajan and Zingales (1995), and Supanvanij (2006), the ratio of operating income to total assets is used as a proxy for profitability.

3.2.2 Growth Opportunitiy
Myers (1977) argues that firms with growth potential will tend to have less debt in capital structure. Growth opportunities can produce moral hazard effects and push firms to take more risk. In order to mitigate this problem, assets in growth opportunities should be financed with equity instead of debt due to minimizing the loss/risk per stockholder. It supports inverse relation between firm growth and leverage which is also the findings of Gued et al. (2003), Sayilgan (2009), Buferna et al. (2005), and Akhtar and Oliver (2009). On the other hand, Titman & Wessels (1988), and Chen (2003) found a positive association between growth opportunities and leverage. According to pecking order theory firm prefers to finance new project with internal funds. Nonetheless, a growing firm may not have sufficient internal funds to finance its new projects frequently. As a result firms require external financing that prefers debt financing to equity financing. Following Chen (2003) and Buferna et al. (2005), the percentage change in book value of total assets is used as a proxy for firm growth.

3.2.3 Tangibility
The tangible assets of a firm can be considered as collateral to ensure guarantees against the default risk of borrowers to its creditors. The trade-off theory predicts a positive relationship between measures of leverage and the proportion of tangible assets. However, the direction of influence has not been clear yet. Empirical studies that confirm the above theoretical prediction include Friend and Lang (1988), Harris and Raviv (1991), Shah & Khan (2007), Rajan and Zingales (1995), Akhtar (2005), and Akhtar and Oliver (2009). Grossman and Hart (1982) suggest the idea that firms with less collateralizable assets should use more debt to monitor managerial activity, even at high cost of debt to limit the manager's tendency to consume excessive perks. This implies a negative relationship between tangibility of assets and leverage which is confirmed by the findings of Sheikh & Wang (2010), Sayilgan et al. (2006), and Abdullah (2005). This study measured tangibility as the ratio of net fixed assets to total assets following Friend and Lang (1988), Shah & Khan (2007), and Akhtar (2005).

3.2.4 Size

The relationship between firm size and leverage is also ambiguous. Some literatures offer the positive relationship between firm size and financial leverage with reasons that larger firms are more likely to be more diversified causes more stable or less volatile cash flows, less often failure, and more utilization of the economies of scale in issuing securities. Eventually, larger firms may issue debt at lower costs than smaller firms. In this case therefore, we can expect size to be positively related to leverage. Empirical studies, such as Rajan and Zingales (1995), and Booth et al. (2001), Gued et. al. (2003) generally found that leverage is positively correlated with company size. On the other hand, some of the studies conducted by Chung (1993), and Ozkan (2001) found no systematic relationship between firm size and total debt ratio. However, Fama and Jensen (1983) argue that there may be less asymmetric information about large firms, since these firms tend to provide more information to outside investors than smaller firms. Therefore, they increase their preference for equity relative to debt. Results of some studies such as Icke and Ivgen (2011), Elli and Farouk (2011), and Kila and Mahmood (2008) revealed negative association between size and leverage. In this study, our expectation on the effect of size on leverage is ambiguous. Following Rajan and Zingales (1995) the natural logarithm of net sales is used as a proxy for size.

3.2.5 Earnings Volatility

Earnings Volatility is a measure of business risk. According to Frank and Goyal (2003), the companies with more volatile cash flows face higher expected costs of financial distress and should use less debt in the objective of maintaining a moderate total risk profile. This suggests a negative relation between earnings volatility and leverage. A number of study such as Harris and Raviv (1991), and Akhtar and Oliver (2009) have indicated a negative relation between earnings volatility and leverage. However, risky firms are more likely to suffer from information asymmetries that make it difficult for firms to issue equity at higher price, and they are expected to have higher levels of leverage. This supports a positive relation between earnings volatility and leverage as shown in Booth et al. (2001), Deesomsak et al. (2004), and Ellili and Farouk (2011). In this study, our expectation on the effect of earnings volatility on leverage is ambiguous. Following Ellili and Farouk (2011) this study uses the ratio of standard deviation of EBIT over total assets to measure earnings volatility.

3.2.6 Non-debt Tax Shield

There is a another type of expenses that has a power of generating tax shield like interest expenses, which is depreciation expenses and that's why both can be considered as tax deductible expenses. Cloyd (1997) claims that the existence of non-debt tax shields provide an alternative (and perhaps less costly) means of reducing income taxes and may serve to mitigate the benefit of debt tax shields. Therefore, some of the literatures like Wiwattanakantang (1999) and Ozkan (2001) found an inverse relationship between non-debt tax shields and debt. But in the contrary to the results of above literatures, Graham (2006) and AL-Shubiri (2010) found a positive relation between non-debt tax shield and leverage. Hence, this study tries to find out whether non-debt tax shield affects leverage. Following Ozkan (2001) the ratio of depreciation over total assets has been used as a measure of non-debt tax shield.

3.2.7 Dividends

Professor Donaldson G. of Harvard (1961) suggested that firms set target dividend payout ratios based on expected future investment opportunities and expected future cash flows. Firms are reluctant to raise dividends unless they are confident that higher dividend can be maintained, and they are especially reluctant to cut the dividends. So dividend payment is likely to play a prominent role in the financing-mix decision mainly because of market imperfections. Bhaduris (2002) suggested that dividends are carefully considered as signal of financial health of a firm by the outsiders. If any increase in dividends signals an increase future earnings then the firm' s cost of equity will be lower, favoring equity to debt. This implies a negative relation between leverage and payout ratio that is also found by Kuczynski (2005), Frank and Goyal, (2003), and Rozeff (1982). On the other hand, the higher the amount of dividend payments the lower the amount of

internal funds to firms. And it needs more external financing. Moreover, if high dividend payout ratio conveys negative information to the investors in a sense that firm is lacking in profitable project resultant low growth opportunity, investors will be unwilling to pay more money for equity and firms prefer debt to equity. Chang and Rhee (1990) found a positive relationship between payout ratio and leverage. But Chen and Chen (2011) found that dividend policy is not significantly related with leverage.

In Bangladesh firms who paid at least 10 percent dividend in last year, that is one of the some obligations, can be categorized as A-category listed company in Dhaka Stock Exchange. In these sense paying a dividend above 10 percent may convey a significant message to investors and it is expected to have an influencing effect on firm's value as well as capital structure. Following Frank and Goyal (2003) dividend payment is used as dummy.

3.2.8 Liquidity
As predicted by the pecking order theory, firms with high liquidity will borrow less. The fact that a firm with more current assets is expected to generate more internal inflows, which can be used to finance its operating and investments activities. Thus a negative relationship between liquidity and leverage is expected. Friend and Lang (1988) Deesomsak, et al. (2004), Sbeiti (2010), and Icke and Ivgen (2011), found liquidity are negatively and significantly related to leverage. On the other hand, trade-off theory suggests a positive relationship between leverage and liquidity because higher liquidity ratio reflects the greater ability of a firm to meet short-term obligation on time. Ozkan (2001) suggests that liquidity has ambiguous effect on the capital structure decisions. In the line with study of Ozkan (2001) the proportion of current assets to current liabilities is chosen as a proxy for liquidity.

3.2.9 Managerial Ownership
According to agency theory, it is expected that there is a correlation between ownership (including managerial ownership) structure and leverage. Moreover, free cash flow theory suggests that managers with only a small ownership interest have an incentive for wasteful behavior or ill-investment. Ellili and Farouk (2011) found an inverse relationship between low level managerial ownership and leverage and a positive relationship between high level managerial ownership and leverage. Harris and Raviv (1991) affirm that the managers increase the debt ratio in order to reinforce their control mainly to control a large fraction of voting rights. Novaes and Zingales (1995) confirm that the threat of a takeover forces the managers to issue debts and to prove their alignment. Huang and Song (2006), confirm such positive correlation. On the other hand, Friend and Lang (1988) and Friend and Hasbrouck (1988) contended that an increase in managerial ownership pushes firms to reduce leverage in order to decrease default risk thereby advocating a negative relationship between managerial ownership and leverage. The results from Mohammed et al. (1998) for a sample of Malaysian firms indicate that both insider ownership and outsider ownership have a significant negative relationship with a firm's long-term debt ratio. According to Huang and Song (2006), in this empirical analysis, the managerial ownership is measured by the total shares held by top managers, directors and supervisors.

3.2.10 Industry Classification
Titman and Wessels (1988), among others, show that industry classification influences firms' capital structure. Harris and Raviv (1991) noted that it is generally accepted that companies in a given industry will have similar leverage ratios while leverage ratios vary across industries. Empirically, the regression results of Abor (2007) indicate clearly that the industry effect is important in explaining the capital structure and that there are variations in capital structure across the various industries. In the context of Bangladesh Sayeed M.A. (2011) found industry classification to be a significant determinants of leverage. Therefore, it is expected that capital structure should vary across different industry groups among listed firms in Bangladesh. Using dummy variables, we test if the leverage ratios are significantly different across the industries of cement, food, fuel & power, ceramic, information technology, pharmaceuticals, and jute in Bangladesh.

4. OBJECTIVES OF STUDY
This study will attempt to accomplish the following objectives:
- i. To identify the firm specific factors affecting capital structure decisions of listed firms in Dhaka Stock Exchange.
- ii. To analyze how the factors affecting capital structure decision are related to leverage.
- iii. To analyze whether each of the factors has significant impact on leverage (total debt to total assets ratio).

5. HYPOTHESES OF THE STUDY
Taking into account the literature on capital structure debate, the null hypotheses we proposed about the possible determinants of the capital structure decisions of listed firms are as follows:

H_{O1}: There is no significant impact of profitability on leverage.
H_{O2}: There is no significant impact of tangibility on leverage.
H_{O3}: There is no significant impact of non-debt tax shield on leverage.
H_{O4}: There is no significant impact of growth opportunity on leverage.
H_{O5}: There is no significant impact of liquidity on leverage.
H_{O6}: There is no significant impact of size on leverage.
H_{O7}: There is no significant impact of earnings volatility on leverage.
H_{O8}: There is no significant impact of dividend payment on leverage.
H_{O9}: There is no significant impact of managerial ownership on leverage.
H_{O10}: There is no significant impact of industry classification on leverage.

6. METHODS AND METHODOLOGY OF THE STUDY
6.1 Sample Size
For the purpose of this study, population has been defined in term of the number of companies listed in Dhaka Stock Exchange Ltd. (DSE). There are 502 firms listed on Dhaka Stock Exchange including 137 non-financial firms in 2012. The banks and the other financial institutions were kept out of this study because of their specific financial activities and their supervision under the central bank. That is why initially this study started its journey taking into account 56 non-financial firms that were listed in DSE during 2003-2007 to discover whether firm's specific factors have significant impact on leverage. 12 firms out of 56 were excluded due to their inexistence in DSE in year 2012 for their continual poor performance that might cause an outlier's effects in that study, and in addition to, 5 firms were omitted because their financial period didn't satisfy the study periods ranging 2003-2007. Finally, our sample size stands at 39 non financial firms. Table 1 shows frequency distribution of industry classification.

Industry	Frequency
Ceramic	3
Cosmetic	3
Pharmaceuticals	10
Jute	3
Fuel &Power	7
Food	10
Information Technology	3
Total	39

TABLE 1: Frequency Distribution of Industry Classification.

6.2 Data Collection Procedures

This study is based on secondary data. The data used in this analysis can be divided into two groups: the firm specific factors influencing capital structure decision (independent variables) and the capital structure's variable (dependent variables). It takes ten potential firm specific factors that may have significant impact on capital structure decision namely profitability, size, tangibility, growth opportunity, earnings volatility, non-debt tax shield, dividend, managerial ownership, liquidity, and industry classification. In this analysis, the capital structure is the dependant variable and it is measured by the leverage. These data have been collected from the book value based yearly financial data given in the financial statements (Balance Sheet & Profit and Loss A/C) of selected companies over 2003 to 2007 which has been gathered from Dhaka Stock Exchange Library.

6.3 Data Analysis Procedures

This study combines cross-sectional with time series to make it a panel data. As noted by Schulman et al (1996), panel data allow economists and other social scientists to analyze, in depth, complex economic and related issues which could not be treated with equal rigidity using time-series or cross-sectional data alone. Like cross-sectional data, panel data describes each of a number of individuals. Like time-series data, it describes changes through time. According to Baltagi (1995), by combining time series of cross-section observations, panel data give "more informative data, more variability, less collinearity among variables, and more efficiency."

Descriptive and quantitative analysis is used for this research. Descriptive analysis presents mean, standard deviation, maximum and minimum value for each variable used in the study. In quantitative analysis, Pearson's correlation and pooled regression analysis is used. In regression analysis fixed effects model is used to investigate the relationship and also to prove the hypotheses. The cross section company data and time series data are pooled together in a single column letting the intercept may differ across each cross-sectional unit (here the eight industries) and each industry's intercept does not vary over time. In addition to, it is assumed that the slope coefficients of the regressors do not vary across industry or over time. Analyses are computed using Statistical Package for Social Science (SPSS) version 16.0 for windows.

Therefore the equation for our regression model is:
$$Y_{it} = \alpha + \beta X_{it} + \varepsilon_{it}$$
Where i =1.....N is denoting the cross-sectional dimension and t =1...T is representing the time series dimension. The left-hand variable, Yit represents the dependent variable in the model, which is the firm's debt ratio. Xit contains the set of explanatory variables in the estimation model, α is the constant, β represents the slope coefficients, and ε is the random errors. In this context, the study includes 195 (=5×39) observations in total as 39 sections and 5 time periods.

The functional form of econometric model is as follows;
$$Lev_{it}=\alpha+\beta_1 Prof_{it}+\beta_2 Tang_{it}+\beta_3 Ndts_{it}+\beta_4 Gro_{it}+\beta_5 Liq_{it}+\beta_6 Size_{it}+\beta_7 Eavo_{it}+\beta_8+Divdum_{it}+$$
$$\beta_9 Mang_{it}+\beta_{10} Indum_{1it}+\beta_{11} Indum_{2it}+\beta_{12} Indum_{3it}+\beta_{13} Indum_{4it}+\beta_{14} Indum_{5it}+$$
$$\beta_{15} Indum_{6it}+\beta_{16} Indum_{7it}+ \beta_{17} Indum_{8it}+ \varepsilon_{it}$$

Where:

	Variables	Measures (proxy)
Lev =	Leverage	Total Debt/Total Assets
Prof =	Profitability	EBIT / Total Assets
Tang =	Tangibility	Net Fixed Assets / Total Assets
Ndts =	Non-debt Tax Shield	Depreciation / Total Assets
Gro =	Growth Opportunity	% Change in Total Assets
Liq =	Liquidity	Current Assets / Current Liabilities
Size =	Size	Natural Logarithm of Sales
Eavo =	Earnings Volatility	Standard Deviation of EBIT/ Total Assets
Divdum =	Dividend Paying Dummy	"1" if a firm pays more than or equal to 10% dividend and "0" otherwise.
Mang =	Managerial Ownership	The part of the capital held by the manager, directors and supervisors.
$Indum_1$ =	Industry Dummy	"1" if the observation belongs to Food, "0" otherwise.
$Indum_2$ =	Industry Dummy	"1" if the observation belongs to Fuel & Power, "0" otherwise.
$Indum_3$ =	Industry Dummy	"1" if the observation belongs to Jute, "0" otherwise.
$Indum_4$ =	Industry Dummy	"1" if the observation belongs to Cosmetic, "0" otherwise.
$Indum_5$ =	Industry Dummy	"1" if the observation belongs to Pharmaceuticals, "0" otherwise.
$Indum_6$ =	Industry Dummy	"1" if the observation belongs to Information Technology (IT), "0" otherwise.

7: ANALYSIS AND DISCUSSION OF RESULTS
This section contains the descriptive statistics, correlation coefficient and the results of regression analysis of 39 sample firms in seven types of industries listed on DSE during the five year period from 2003 to 2007. The interpretation of the empirical findings is also presented in this section. Finally, important conclusions about the results of the study have been drawn.

7.1 Descriptive Statistics
The analysis of this study starts with a descriptive statistics of dependent and independent variables revealing mean, maximum, minimum, and standard deviation presented in table 2. From the table 2, the results of dependant variables, which is the ratio of total debt to total assets, shows that on average selected Bangladeshi companies are financing 60% of total assets with total debts. The maximum debt financing used by any one company in any year is 360.41% which seems to be unusual but it may happen when the equity of one company is negative. The minimum level of debt ratio is 15%.

	Mean	Maximum	Minimum	Std. Deviation
Lev	59.9638	360.41	.15	46.61529
Prof	5.4416	35.87	-16.25	7.87189
Tang	47.0537	97.97	.02	25.35355
Ndts	3.3367	18.10	.00	3.09299
Gro	10.2551	153.41	-33.81	22.67409
Liq	2.5541	253.00	.02	15.11372
Size	18.9223	23.12	.00	2.79308
Eavo	3.6978	75.00	.11	5.40012
Divdum	.6591	1.00	.00	.47510
Mang	44.9589	92.72	.01	17.91285

Table 2: Summary of Descriptive Statistics.

Source: Calculations based on annual financial reports of 39 listed firms during 2003-2007

The average value of profitability is 5.4416% with the variation of individual data set from the mean value by 7.87189%. The maximum profitability for a firm in any year is 35.87% while the minimum value is -16.25%. The mean value of tangibility shows that, on average, firms use 47.0537% of net fixed assets in their assets structure. The maximum tangibility for a firm in any year is 97.97% and minimum value of tangibility is .02%. The mean value of non-debt tax shield is 3.3367% with a standard deviation of 3.09299 %. The minimum value of no-debt tax shield for a firm in any year is 0.00 which means that no depreciation has been computed and it may possible if firms do not go to production and trading. The average growth rate of selected firms is 10.2551% with a standard deviation of 22.67409%. The liquidity ratios indicate that on average firms use current assets by 2.5541 times of current liabilities. The mean value of size measured in log of sales is 18.9223% while the standard deviation is 2.79308. The maximum and minimum value of size is 23.12 and 0.00 respectively. The mean value of earnings volatility measured in the ratio of standard deviation of EBIT over total asset is 3.6978-time with a standard deviation of 5.40012. On average, 44.958% of firm's ownership is held by the directors, sponsors, and managers, which are the measure of managerial ownership, while the standard deviation is 17.91285%. The maximum value of managerial ownership is 92.72% and minimum value is 0.01%.

7.2 Collinearity
To examine the existence of multicolinearity among regressors pearson correlation coefficients is used. In general, independent variables having collinearity at 0.7 or greater would not include in regression analysis due to multicollinearity. As shown in table 3 the highest correlation coefficient is 0.4275 between profitability and dividend payment. Thus all of the independent variables are free from serious problems of multicollinearity and more competent for regression analysis.

	Lev	Prof	Tang	Ndts	Gro	Liq	Size	Eavo	Divdum	Mang
Lev	1.0000									
Prof	-0.4205	1.0000								
Tang	0.0609	0.1378	1.0000							
Ndts	0.1666	0.1895	0.2966	1.0000						
Gro	-0.1411	0.1924	0.0648	0.0337	1.0000					
Liq	-0.3271	0.1012	-0.2585	0.2804	0.1627	1.0000				
Size	-0.0877	0.4146	-0.2011	0.0174	0.0616	0.0321	1.0000			
Eavo	0.0604	0.1187	0.1455	0.0814	0.0247	-0.0586	-0.0315	1.0000		
Divdum	-0.2017	0.4275	-0.2203	0.1241	-0.0344	0.0963	0.2729	-0.1365	1.0000	
Mang	-0.1519	0.0315	-0.2966	-0.1256	0.0380	0.0408	0.1162	0.0738	-0.0979	1.00000

Table 3: Summary of Pearson Correlation Coefficients between Variables.

7.3 Regression Model
7.3.1 Results of Regression Analysis

Table 4 shows the results of pooled regression analysis, in which fixed effect model is applied. In our regression model for leverage has an R-squared (coefficient of determination) of 0.501.It tells us that the fraction of variation in the dependent variable that is explained by variation in the independent variables more precisely it shows how well the sample regression line fits the data (goodness of fit). Thus, 50.1% of the variation in leverage (Total Debt/Total Assets) is accounted for by variation in the independent variables. The value of adjusted R-squared is 0.459. F-statistic, 11.982, shows that overall model is satisfied at the 1% level. But the low value of Durbin-Watson, 0.770, signals that perhaps the model is affected by positive autocorrelation. The existence of autocorrelation does not bias the estimated coefficient, but it makes the estimates of the standard errors smaller than the true standard errors. This means that the t-ratios calculated for each coefficient will be overstated, which in turn may lead to the rejection of null hypothesis that should not have been rejected. So it is no longer successful to interpret the estimated regression coefficient presented in table 4.

Coefficients [a]

	Beta Coefficients	Standard Error	t-value	Sig.
(Constant)	89.123	31.653	2.816	.005
Prof	-3.030	.532	-5.695	.000
Tang	-.388	.155	-2.508	.013
Ndts	10.471	1.385	7.561	.000
Gro	.168	.138	1.214	.226
Liq	-9.866	2.043	-4.830	.000
Size	.632	1.312	.482	.630
Eavo	.791	.471	1.679	.095
Divdum	-12.163	7.164	-1.698	.091
Mang	-.704	.187	-3.767	.000
$Indum_1$	19.572	11.447	1.710	.089
$Indum_2$	36.915	12.054	3.063	.003
$Indum_3$	13.699	14.136	.969	.334
$Indum_4$	43.592	14.047	3.103	.002
$Indum_5$	23.016	11.464	2.008	.046
$Indum_6$	-52.718	21.757	-2.423	.016

Table 4: Regression Model results

Model Summary [b]

R- Squared	.501
Adjusted R -Squared	.459
Durbin-Watson	.770
F-statistic	11.982
Sig. (F-statistic)	.000

a. Predictors: (Constant), Prof, Tang, Ndts, Gro, Liq, Size, Eavo, Divdum, Mang, $Indum_1$, $Indum_2$, $Indum_3$, $Indum_4$, $Indum_5$, $Indum_6$

b. Dependent Variable: Lev

R-squared and Adjusted R-Squared measure "Goodness of Fit".

Since this study has an attempt to investigate the impact of firm specific factors on capital structure decision, it ran an autoregressive model, among the several suggested models, for estimating factual regression coefficient through eliminating the possible effects of autocorrelation. In autoregressive model one lagged value of dependent variable is employed as an independent variable. Table 5 shows the results of autoregressive model.

Coefficients [a]

	Beta Coefficients	Standard Error	t-value	Sig.
(Constant)	51.657	21.815	2.368[**]	.019
Prof	-1.796	.374	-4.800[*]	.000
Tang	-.284	.106	-2.674[*]	.008
Ndts	7.799	.966	8.075[*]	.000
Gro	.161	.095	1.704[***]	.090
Liq	-5.918	1.425	-4.154[*]	.000
Size	-.318	.900	-.353	.724
Eavo	.348	.324	1.076	.283
Divdum	-7.848	4.911	-1.598	.112
Mang	-.269	.131	-2.042[**]	.043
$Indum_1$	.715	7.942	.090	.928
$Indum_2$	15.412	8.383	1.838[***]	.068
$Indum_3$	2.846	9.702	.293	.770
$Indum_4$	19.375	9.759	1.985[**]	.049
$Indum_5$	10.004	7.896	1.267	.207
$Indum_6$	-41.331	14.907	-2.773[*]	.006
TD/TA(1-lagged)	.598	.042	14.296[*]	.000

Table 5: Results of Autoregressive Model

TD/TA= Total Debt/ Total Assets
*significant at 1% level
** significant at 5% level
*** significant at 10% level

Model Summary [b]

R- Squared	.768
Adjusted R -Squared	.747
Durbin-Watson	1.837
F-statistic	36.769
Sig. (F-statistic)	.000

a. Predictors: (Constant), Prof, Tang, Ndts, Gro, Liq, Size, Eavo, Divdum, Mang, $Indum_1$, $Indum_2$, $Indum_3$, $Indum_4$, $Indum_5$, $Indum_6$, TD/TA(1-lagged)
b. Dependent Variable: Lev

R-squared and Adjusted R-Squared measure "Goodness of Fit".

The results of this regression reveal the Durbin-Watson of 1.837 which is almost close to 2, but it is not appropriate to find out if there is any autocorrelation in the data because the model contains lagged regressand as a regressor. For this type of model Durbin has developed the so-called *h-statistic* to test for serial correlation. According to Durbin, *h-statistic* follows the standard normal distribution where the null hypothesis is ρ (rho) =0, that is, there is no first order autocorrelation.

From the properties of normal distribution it is given that the probability of $|h|>1.96$ is about 5 percent. Therefore, we can reject the null hypothesis that ρ (rho) =0, that is, there is evidence of

first order autocorrelation in the autoregressive model, if a calculated $|h|$ is greater than 1.96. Since the sample used in this study is reasonable large and the computed *h,* (1.4051), is less than 1.96, null hypothesis can't be rejected at 5% significance level. So our results confirm that there is no strong evidence of serial correlation in this model. According to autoregressive model,

the value of R-squared (0.768) suggests that 76.8% of the variation in leverage is captured by the variation in the regressors. The result of F-statistic is 36.769 which shows that the model is statistically significant at 1 % level and hence prove the validity of estimated model.

7.4 Discussion of Results
7.4.1 Profitability
As it is observed from the table 4, the coefficient value of profitability is -1.796 which is significant at 1% level. Thus, first null hypothesis, profitability has no significant impact on leverage, is rejected. Negative coefficient of profitability implies that 1% increase in the ratio of EBIT/Total Assets causes the ratio of TD/TA to decrease by 1.796%. The negative relation between profitability and leverage is consistent with pecking order theory, whereas trade off theory is not substantiated. That means that profitable firms listed in DSE use internal funds at first to finance its assets before seeking debts. Thus the more profitable firms would tend to use lower debts in their capital structure. This result is also in line with other studies as Rajan & Zingales (1995), Sayilgan et al. (2006) and Sheikh & Wang (2010). This finding is contrast to the previous findings by Sayeed M.A. (2011) in Bangladesh. He found that profitability has insignificant and positive association with leverage. However the reason may be that he used the ratio of net income to total assets as a proxy of profitability and this study used the ratio of EBIT to total assets.

7.4.2 Tangibility
The negative coefficient value of tangibility rejects the second hypothesis, tangibility is not impacting leverage ratio significantly, at 1% significance level. The coefficient value of tangibility is -0.284 which reveals that 1% increase in the ratio of net fixed assets to total assets of listed firms in DSE leads to 0.284% decrease in the ratio of total debt to total assets. This negative association between tangibility and leverage is consistent with implication of pecking order theory and contradict with trade off theory. According to Gaud et al. (2005), in favoring of this association, the companies with lower level of tangible assets are more subject to information asymmetry problems that lowers price of equity, and consequently, more willing to use debt to finance their assets. The results also support the findings of Sheikh & Wang (2010), Sayilgan et al. (2006), and Abdullah (2005). Sayeed M.A.(2011) and Lima (2009) found a positive coefficient of this control variable in Bangladesh using total fixed assets to total assets as a proxy of tangibility, but this study used net fixed assets to total assets as a measure of this control variable, where net fixed assets are gross fixed assets less accumulated depreciation and found negative coefficient value that may be the reason of inconsistent results with those of previous studies.

7.4.3 Non-debt Tax Shield
Results of regression model show that exogenous non-debt tax shield has significant positive association with leverage and third hypothesis is rejected at1% level. A positive coefficient value of non-debt tax shield, (7.799), explains 1% increase in the ratio of depreciation to total assets results in 7.799% increase in the leverage ratio. Bangladeshi firms heavily depend on depreciation as well as debt to enjoy a big advantage of tax shield. This result is in line with AL-Shubiri (2010) who also found a significant positive relation between leverage and non-debt tax shield but it contrasts with the findings of Sayeed M.A (2011) most probably due to different cross-sectional and time series observations.

7.4.4 Growth Opportunity
Beta coefficient value of control variable growth is 0.161 and rejects the fourth hypothesis at 10% significance level. This positive coefficient implies that 1% change in growth rate which is measured by the percentage change in total assets leads to 0.161% change in leverage ratio. Although this relationship is in contradiction with what the trade-off theory predicts. However, it supports pecking order theory and signaling theory with an explanation that growing firm require more financing but may not have sufficient retained earnings and then firms go to finance their new projects with debt financing before equity financing. The results of this study are in compliance with the results of Titman & Wessels (1988), Chen (2003), Abdullah (2005), Sheikh & Wang (2010), Lima (2009), and AL-Shubiri (2010).

7.4.5 Liquidity
One of the most important explanatory variables in this study is liquidity that has not been used as control variable in Bangladesh yet and it is significant at 1% level in this study. Beta coefficient associated with liquidity rejected the fifth null hypothesis. The coefficient of liquidity is -5.918. It suggests that liquidity has strong negative impact on leverage for listed firms in DSE. This association of liquidity with leverage confirms to the prediction of pecking order theory. Firms that maintain high liquidity ratio tend to employ less debt in their capital structure because it is expected that they are able to generate high cash inflows and resultant the excess cash flows can be used to finance the operations and investment activities. The findings also confirm some earlier studies such as Friend and Lang (1988), Sheikh and Wang (2010), Icke & Ivgan (2011), and Abdullah (2005).

7.4.6 Size
The regression model finds insignificant negative relation between size measured in log of sales and leverage and thus sixth null hypothesis is accepted. One possible explanation regarding the negative sign of size may be that bigger size firms have more easy access in equity market form where they can raise substantial long term funds at true price due to less asymmetric information compared to firms of smaller size that confirms the view of Fama and Jenson (1983). The negative association between size and leverage is also in the line with Icke and Ivgan (2011), Elli and Farouk (2011), and Kila and Mahmood (2008). This result does not parallel the findings of previous study done by Sayeed M.A. (2011) for selected Bangladeshi listed companies as likely as not due to use of ln(total assets) in his study as a proxy of size of firm instead of ln(net sales).

7.4.7 Dividend Payment
Dividend, Control variable, has not been used yet in Bangladesh in measuring its effects on leverage that is why it gives us new insights into this field. The negative relationship between dividend payment and leverage is observed in this study but the eighth hypothesis has not been rejected at 10% level. The beta coefficient of dividend payment is -7.848. It implies that dividend payment has negative impacts on leverage. Though negative sign is consistence with signaling theory sustaining one possible explanation that a firm with a dividend payment above 10% can send a message to public about favorable future earnings capacity, causing investors to discount the firm's earnings at a lower rate and, all else being equal, to place higher value on the firm's stock. Therefore, high payout firms can enter equity market with low costs that lowers the firm's necessity to seek more debt. This result also indicates that investors of DSE prefer high payout ratio to low payout ratio and this investors' behavior may impede the growth of firm as it makes firms reluctant to create retained earnings. This result is compliance with the findings of Chen & Chen (2011).

7.4.8 Earnings Volatility
The insignificant positive relationship between earnings volatility and leverage is found in this study with a coefficient value of 0.348. Thus results of regression do not reject the seventh null hypothesis. One possible explanation is that the higher the earnings volatility the higher the risk of firms, resulting in firms are no longer beneficiary to issue equity due to high cost of equity and intend to use debt in their capital structure. This result is in line with Booth et al. (2001), Deesomsak et al. (2004), Ellili and Farouk (2011) and Sayeed M.A. (2011).

7.4.9 Managerial Ownership
There are very few empirical evidence in examining the impact of managerial ownership on capital structure decision especially in Bangladesh. In this study it is found that managerial ownership is negatively related to leverage at 5% significance level. The coefficient of this control variable is -.269 that rejects the ninth hypothesis. This sign implies that any increase in managerial ownership results in a decrease in leverage ratio. One possible explanation regarding this result is that when managers are given more shares of the company they become high risk averse and more reluctant to invest in risky project thus firm's profit may be more stable . According to Smith (1990), there exists a positive relationship between management ownership and the performance of the firm. In addition to, an increase in managerial ownership significant

portion of agency costs can be eliminated because they work in the interest of the share holders and finally it leads to increase profit, retained earnings and firm performance. For high profit the availability of retained earnings of a firm lowers the use of debt in capital structure. These findings are partly in compliance with Ellili and Farouk (2011).

7.4.10 Industry Classification
To identify the impact of industry classification on firm's leverage, total numbers of firms used in this study were categorized into seven industries namely Food, Fuel and Power, Jute, Cosmetic, Pharmaceuticals, Information Technology (IT), and Ceramic in accordance with the category read by DSE. In our study it is revealed that Fuel & Power, Cosmetic, and IT industry are statistically significantly different from Ceramic industry at least at 10% significance level and thus tenth hypothesis is rejected. On the other hand Pharmaceuticals, Jute, and Food are not significantly different from Ceramic industry.

Lagged dependant variable Total Debt/Total Assets (one lagged) has significant positive impact on leverage.

8. CONCLUSION
This study attempted to investigate how firm specific factors are impacting the capital structure decision of a sample of 39 Bangladeshi firms listed in DSE utilizing OLS regression method. Data were collected from the financial statements of each firm during the five-year period from 2003 to 2007. Under OLS regression, fixed effect model was run but the results were affected by autocorrelation. As a remedial measure of autocorrelation, autoregressive model was used to examine the impact of ten explanatory variables such as profitability, tangibility, non-debt tax shield, size, earnings volatility, liquidity, managerial ownership, dividend payment, growth, and industry classification on total debt to total assets ratio. The findings of the study show that profitability, tangibility, liquidity, and managerial ownership have significant negative relations with leverage. This study also found that growth and non-debt tax shield are positively and significantly related with leverage. Where as size, earnings volatility, and dividend payment were not found to be significant explanatory variables of leverage. Results also reveal that leverage ratios are significantly different across Bangladeshi industries. Overall all the results are almost consistent with previous study and capital structure.

Nonetheless, the limitations of this study can open the door of opportunity for further research work in this area. This study only uses total debt to total assets as a dependent variable, the other definition of leverage can be used in future study to identify which definition of leverage is powerfully explained by given control variables. In conclusion, overall results can be improved by including new explanatory variables and observations.

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