

Exploring the Underlying Factors Affecting Capital Structure Decision: A Quantitative Analysis

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Abstract: Objective: *This study deploys an earnest effort to understand the factors that affect the managers involved in managing the portfolio of funding in companies. Capital structure decision is one of the important decisions that finance managers are involved with. This study tries to identify a host of factors controlling the attitude of finance managers in choosing different sources of financing as reflected in financials of respected companies.*

Design/methodology/approach: *An exploratory form of research is applied here based on the data available in different secondary sources like the financial statements published by sampled companies. Sample for the study is selected from companies listed in Dhaka Stock Exchange in pharmaceutical, textile and banking sectors. Different descriptive and inferential statistical tools are used to present the data and test relevant hypotheses by using SPSS.*

Findings: *The study has identified couple of factors affecting capital structure decision based on literature review. These factors are replicated in selected Bangladeshi firms to understand their implications. And the study fails to report any determinants having strong relationship which is statistically significant, however, the model passes goodness-of-fit test and residual analysis shows the presence of normality.*

Research limitations/implications: *The findings of the study couldn't be generalized due to some inherent limitations of the research. The study only covers selective companies from three*

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sectors leaving others from the preview of analysis which limits the scope of the study. However, the finding of the research could be helpful for individual firms to find their status in the recent trend of practicing capital structure decision and thereby they can adopt or revise their policy in this regard. Another major limitation of the study is that it applies a quantitative forms of analysis based on data published in general purpose financial statements. It would be better if quantitative findings could be validated through qualitative analysis to bring data triangulation which is left for further study. Extending the analysis to cover all the firms listed in DSE can give a better look on capital structure issues in Bangladesh.

Originality/value: This study is being conducted for the first time in Bangladesh in order to identify determinants from different theories which will help the future researchers to extend the analysis. Thus, the study adds significant value to the current body of knowledge.

Keywords: Capital structure; determinants; Dhaka Stock Exchange; Bangladesh.

JEL Classification: C 12; G 32; O16.

1. Introduction

For Debt equity choice, there is no universal theory to carry forward (Myers, 2001). However, there are a number of useful conditional theories, each of them supporting to recognize the debt-to-equity structure that organizations decide on. These theories can be parted into two side – either they pretend the entity of the optimal debt-equity ratio for every firm (so-called static trade-off models) or they allege that there is no well-defined practice capital structure which is known as pecking-order hypothesis. To avoid the preferences and other conflicting issues surrounding the capital structure theory, this study explores a very basic objective in capital structure decision based on published data.

Capital structure decision of a firm is being affected by a good number of factors. These factors may be completely external to the firms and they may be internal as well. External factors are mostly macro-economic variables like inflation, interest rate, monetary policy and internal factors are purely specific to particular firm like profitability, size, age, liquidity, tangibility etc. Corporate finance literature gives a testimony on studying the underlying factors affecting the capital structure decision of firms. This study is very usual in that sense; however, it captures different theories on capital structure and has identified mostly internal factors with reference to those theories and analyzes the relationship quantitatively.

The way Modigliani & Miller (1958) have started capital structure theory have narrowed down the scope of work, looking for only an optimum capital structure as a targeted debt-to-equity ratio that would minimize the overall cost of financing. However, by 1984, the focus turned into identifying underlying factors influencing the choice of sources of

financing. The primary goal of this study is to determine if there are any firm-specific factors that systematically influence the capital structure of the companies based on quantitative data published in general purpose financial statements by the sampled companies.

2. Theoretical Framework

The study of capital structure theory begins formally with the irrelevance proposition of Modigliani and Miller and their hypothesis that “in perfect markets, it does not matter what capital structure a company uses to finance its operations”. There are lot of theories addressing the mixture of debt and equity in forming capital base for companies. Some of the notable theories are trade off theory (TOT), pecking order theory (POT), signaling theory (ST), market timing theory (MTT), agency cost theory (ACT), free cash flow theory (FCFT) and contracting cost theory (CCT). Every theory has its own way of bringing optimization in capital structure decision. The proponents of these theories have also identified different factors affecting the inclusion of debts in capital structure along with the dimensions of relationship which is presented in the table below:

Table 1: Relationships between capital structure and its determinants across different capital structure theories [meanings of the symbols used in the table: Positive (+); Negative (-), Positive/Negative (+/-); No relation (x); Unknown (‡); Support not found (!)]

Determinants	Capital Structure Theories						
	TOT	POT	ST	MTT	ACT	FCFT	CCT
Size	+	+/-	!	‡	‡	‡	‡
Tangibility of Asset	+	-	x	‡	+/-	‡	‡
Profitability	+	-	+	‡	+	‡	‡
Growth and Growth Opportunities	-	+/-	+	-	‡	‡	‡
Non-debt Tax Shield	-	x	x	‡	‡	‡	‡
Cost of Financial Distress	-	x	x	‡	‡	‡	‡
Risk	-	-	‡	‡	‡	‡	‡
Ownership Structure	‡	‡	‡	‡	‡	‡	‡
Economic Growth	+	-	‡	‡	‡	‡	‡
Liquidity	+	-	‡	‡	‡	‡	‡
Inflation	+	‡	‡	‡	‡	‡	‡
Age of Enterprise	+	-	‡	‡	‡	‡	‡
Dividend	-	+	‡	‡	‡	‡	‡
Interest Expense	‡	-	‡	‡	‡	‡	‡
Product Uniqueness	-	‡	‡	‡	‡	‡	‡
Bankruptcy	-	‡	‡	‡	‡	‡	‡

Source: Authors' own compilation

Based on the analysis presented in above table and availability of data, this study considers the prevalence of trade off theory in Bangladesh and develops an understanding of capital structure on the basic premise of trade off theory. This theory suggests that optimal point of the debt is where situating at the edge of benefit of debt finance is same to its marginal cost. To calculate financial distress and tax shield with adjusting debt and equity ratio, firms can acquire an optimal capital structure. Myers (1984) used the trade of theory to explain “Capital Structure Puzzle” and suggested debt should be adjusted at a certain point to balance interest tax shield and financial distress. Similarly, Jensen & Meckling (1976) also used the trade off model to separate bankruptcy cost from agency cost. Agency cost can be reduced by debt and higher debt can be paid out more cash for large amount of capital (Jensen, 1986). Harris & Raviv (1990) suggested that debt capital provides significant reports in the capital structure in controlling the agency behavior and managers are not willing to liquidate the firm or serve these information for their own interest which may guide to bankruptcy. Trade off theory postulates that every firm has an optimal debt ratio at which the tax shield same as the financial distress cost.

Trade off theory may be static or dynamic. Rasiah & Kim (2011) mentioned that the static trade off theory introduces financial policy such as the palliation of free cash flow, agency costs, the tax advantage of debt, the agency cost of stakeholders, the cost of financial distress which is chosen by the firm to compare the cost and benefit of the costs to meet the optimal capital structure. Though static trade off theory determines optimal capital structure, it never contradicts with symmetric information and the assumptions of market efficiency. The dynamic trade off theory, on the other hand, is developed by Fischer et al. (1989) as a hypothesis from the static trade off theory. Fischer et al. (1989) assured that various firms allow actual leverage ratio to deviate from target ratio in different quantity. This theory works on asset variability, costs of recapitalization, benefits and costs of debt financing. Optimal capital structure may vary for actual leverage ratio and the financing activities of a firm will symmetry to conduct the leverage ratio back to advantage the cost of adjustments. Firms will deviant on optimal capital structure with no transection cost on perfect world market. Dangi & Zechner (2004) argued that the dynamic trade off theory primarily uses less debt on capital structure in opposition to static trade off strategy. This study develops the basic understanding of optimal capital structure decision based on the tradeoff between the tax benefit of inclusion of more debt in capital structure and resultant agency and bankruptcy cost.

3. Literature Review and Development of Hypotheses

Capital structure is defined as a business firm needs capital resources to finance its operations by particular alternative of leverage and owner's equity. Song (2005) argued

that capital structure decision means a mix of various types of securities such as preferred stock, common stock, convertible debt, long term debt issued through a firm to finance its assets. If a firm has a gap between the money which is needed a firm and equity, the firm can meet the gap by issuing debt or equity. Frank & Goyal (2009) investigated that if we consider only short-term debt or long term debt or total debt then the capital structure decisions may differ. As Harris & Raviv (1991) state: "Several studies shed light on the specific characteristics of firms and industries that determine leverage ratios. [...] These studies generally agree that leverage increases with fixed assets, non-debt tax shields, growth opportunities, and firm size and decreases with volatility, advertising expenditures, research and development expenditures, bankruptcy probability, profitability and uniqueness of the product." However, the results of both theoretical and empirical studies are not always unambiguous. An extended literature review identified several factors affecting the choice of sources of financing in capital structure which are identified in the table below:

Table 2: Factors influencing the choice of sources of financing in capital structure

Determinants	Relevant Literature
Size	Baker & Martin (2011), Rajan & Zingales (1995), Jensen & Meckling (1976), Titman & Wessels (1988), Wald (1999), Icke and Ivgen (2011), Antoniou et al. (2002), Jong et al. (2008), Bauer (2004), Booth et al. (2001), Kila & Mahmood (2008), Deesomsak et al. (2004), Gued et al. (2003), Eriotis et al. (2007), Smith (1977), Frank & Goyal (2009), Frydenberg (2004), Warner (1977), Ang et al. (1982), Bevan & Danbolt (2000), Chen (2004), Elli & Farouk (2011), Marsh (1982)
Tangibility of assets	De Jong et al. (2008), Camara (2012), Haron (2014), Ross et al. (2008), Jensen & Meckling (1976), Frydenberg (2004), Myers (2001), Booth et al. (2001), Myers & Majluf, (1984), Huang & song (2006), Jong, et al. (2008), Huang & Song (2006), Frank & Goyal (2009), Bennett & Donnelly (1993), Wald (1999), Zou & Xiao (2006), Viviani (2008), Serrasqueiro & Rogao (2009), Titman & Wessels (1988), Hewa Wellalage & Locke (2012), Shah & Khan (2007), Margaritis & Psillaki (2007), Chen (2004), Antoniou et al. (2002), Rajan & Zingales (1995)
Profitability	Huang & Song (2006), Sheikh & Wang (2010), Frank & Goyal (2009), Huang (2004), Bowen et al. (1982), Jensen (1986), Leland & Pyle (1977), Reinhard & Li (2010), Margaritis and Psillaki (2007), Booth et al. (2001), Jordan et al. (1998), Sayilgan et al. (2006), Guney & Paudyal (2002), Akita (2005), Fama & French (2002), Gaud et al. (2005), Viviani (2008), Kim et al. (2006), Sayeed M.A. (2011), Abor (2005), Tong & Green (2005), Chiang et al. (2010), Rajan & Zingales (1995), Supanvanij (2006)
Growth and Growth Opportunities	Baker & Wurgler (2002), Myers (1977), Chen (2004), Deesomsak et al. (2004), Zou and Xiao (2006), Frank and Goyal (2009), Jensen (1986), Bevan & Danbolt (2000), Titman & Wessels (1998), Buferna et al. (2005), Eriotis et al. (2007), Sayilgan (2009), Karadeniz et al. (2009), Gued et al. (2003), Akhtar & Oliver (2009), Ooi (1999), Huang & Song (2006), Rajan & Zingales (1995)
Non-debt tax shield	Frank & Goyal (2009), Lim (2012), Antoniou et al. (2008), Bradley et al. (1984), Wald (1999), Chaplinsky and Niehaus (1993), Ozkan (2001), Wiwattanakantang (1999), Bauer (2004), Deesomsak et al. (2004), Viviani (2008), AL-Shubiri (2010), Graham (2006), DeAngelo & Masulis (1980), Titman and Wessels (1988).

Determinants	Relevant Literature
Risk	Cassar & Holmes (2003), Baranoffetal (2007), Titman & Wessels (1988), Wiwattanakantang (1999), Omran & Pointon (2009), Ezeoha (2011), Viviani (2008), Gaud et al. (2005), Sheikhand Wang(2011), Chung (1993), Aborand Biekpe (2009), Frydenberg (2004), Myers (1977), Su (2010), De Angelo & Masulis (1980), Harris & Raviv (1990), Bauer (2004), Kim & Sorensen (1986), Jordan et al. (1998).
Ownership Structure	Booth et al. (2001), Jensen & Meckling (1976), Shleifer & Vishny (1994), Dewenter & Malatesta (2001), Li et al. (2009), Huang & song (2006), Su (2010), Brav (2009), Chen et al. (2013), Friend & Lang (1988), Ellili & Farouk (2011), Novaes & Zingales (1995), Friend & Hasbrouck (1988), Mohammed et al., 1998), Gordon & Li (2003), Allen et al. (2005), Jensen (1986), Huang & Song (2006).
Liquidity	De Jong et al. (2008), Ross (1977), Myer (1984), Titman & Wessels (1988), Deesomsak et al. (2004), Mazur (2007), Viviani (2008) Eldomiaty & Azim (2008), Bevan & Danbolt (2002), Kim et al. (1988), Opler et al. (1999), Afra & Hossain (2011), Friend & Lang (1988), Eriotis et al. (2007), Sheikh & Wang (2011), Rajan & Zingales (1995)
Inflation	Booth et al. (2001), Graham & Harvey (2001), Frank & Goyal (2009), Hatzinikolaou et al. (2002)
Age of Enterprise	Harris & Raviv (1991), Johnson's (1997), Ramjee and Gwatidzo (2012), Petrunia (2010), Ahmed et al. (2010), Ming-Chang Cheng et al. (2011)
Dividend	Frydenberg (2004), Ali (2011), Bhaduri (2002), Frank & Goyal (2009)
Interest Expense	Walaa Wahid ElKelish (2007), Marsh (1982), Dhankar (1996)

Source: Authors' own compilation

Based on the data availability, the study has taken the following determinants of capital structure: size, tangibility of assets, profitability, growth opportunities, non-debt tax shields, risks, liquidity, age of enterprises, dividends, etc.

Size

From the conceptual point of view, the cause of size on leverage is not unambiguous. Most of the large firms have various types of operations which give them more strength to survive eventually (Rajan & Zingales, 1995). Jensen & Meckling (1976) commented that this ability makes agency cost lower and these firms are mostly uncorrupted when they are listed in the stock exchanges. Firm size is represented by the logarithm (natural) of net sales (Rajan & Zingales, 1995). Baker & Martin (2011) found that financial distress costs usually affect firm size. Trade off theory says that large firms are cautious about further diversification and few eager about bankruptcy. When large firms issue long term debt, mostly they spend low exploit cost. Large firms can issue debt compare to cheaper than small firms.

A firm's varieties of earnings are reflected by its size (Titman and Wessels, 1988). Although large companies carry on their operations with a lower bankruptcy cost, it should have more debt than small firms. Due to lower risk of inability, large firms accept

maximum credit ratings. Their reputations of debt markets are good but debt related agency costs are low.

Wald (1999) got significant positive result between firm leverage and firm size in the context of Japan, USA, France and UK. Antoniou et al. (2002) also supports the result about UK and France. Empirical studies such as Jong et al. (2008), Marsh (1982), Rajan & Zingales (1995), Bauer (2004), Booth et al. (2001), Deesomsak et al. (2004), Gued et al. (2003), Eriotis et al. (2007) have indicated that a significant positive relationship exists between firm size and leverage. Frydenberg (2004) also concluded a positive assistant for size variables. Warner (1977) and Ang et al. (1982) found that firm size is decreased by direct bankruptcy cost and the supply of debt has positively been influenced by firms' size.

Pecking order theory, on the contrary, indicates that there is a negative relationship between leverage and firm size. Titman & Wessels (1988) also found an opposite relationship within a firm's debt (short-term) and its size which indicates the existence of transaction costs for comparable firms. It means maturity of debt and firm size are also connected with each other. There is a trend to issue more equity and long-term debt for large firms at a lower cost than smaller firms do. The chance of issuing undervalued equity is reduced by low asymmetric information. External investors may prefer to retain equity rather than debt which has an inverse relation between firm size and the availability of information (Rajan & Zingales, 1995). Bevan & Danbolt (2000), Chen (2004), Icke & Ivgen (2011), Elli & Farouk (2011), and Kila & Mahmood (2008) found that there is an inverse association between firm size and leverage. Based on the above literature, the natural logarithm of sales is used in this study to proxy for the size of a firm. The below hypothesis is taken to test whether the capital structure is being affected by the respective size of the company.

H1: Firm's size is a determinant of Capital Structure.

Tangibility of Assets

Tangibility of assets is disclosed as the percentage of plant, property (net) and equipment (fixed assets) over total assets (De Jong et al., 2008; Rajan & Zingales, 1995; Haron, 2014; Camara, 2012). A company can collect debt capital very easily at a lower cost having more tangible assets compared to other companies don't having enough tangible asset. The tangibility of assets increases trading power of a company. Ross et al. (2008) indicated that huge number of physical asset may borrow more commitment about their physical assets as parallel & preventive borrower risk of enduring like agency cost of debt. Agency cost exists within the shareholders &

creditors (Jensen & Meckling, 1976). For instance, after borrowing the money from creditors, firm can invest it in any project which is not safe for shareholders. It appears that firm can increase debt who has low agency cost. So, trade-off theory pretends a positive relevance within debt and assets tangibility.

On the other hand, few researchers worked on intangible assets and leverage. Frydenberg (2004) investigated in the context of Norway and found that those firms who have fixed assets to intangible assets should have more long-term debt compare to short-term debt. Myers (2001) told that there is an inverse relation between intangible assets and leverage. Similarly, there is an inverse relation within leverage and asset tangibility in ten developing countries (Booth et al., 2001).

According to asymmetric information (signaling theory), outside investors such as shareholders have less information compare to managers. It may be convenient to sell out secured debt whereas there is certain issuing securities cost (Myers & Majluf, 1984). So, firms can avoid agency cost for issuing secured debt through physical assets. It ensures the positive association within tangibility & firm's leverage. It implies that asset tangibility has a significant role in banks' credit policy especially authentic for long term loans.

Several studies happened in different context such as china (Huang & Song, 2006; Chen 2004), Germany (Antoniou et al., 2002), UK (Bennett & Donnelly, 1993) and they confirmed that tangibility of asset is positively related with leverage. Similarly, other researchers also concluded in same opinion (Margaritis & Psillaki, 2007; Jong et al., 2008; Wald, 1999; Zou & Xiao 2006; Viviani, 2008; Serrasqueiro & Rogao, 2009; Titman & Wessels, 1988; Hewa Wellalage & Locke, 2012). Rajan & Zingales (1995) studied in developed countries and got positive relation. However, results from developing world are mixed. In this study, tangibility is defined as fixed assets divided by total assets. The study takes the following hypothesis to be tested.

H2: Tangibility of asset is a determinant of capital structure.

Profitability

According to trade off theory, a firm may get more tax benefit if the firm has more cash to afford more debt (Huang 2004). Bowen et al. (1982) showed a positive relationship between profitability and leverage. According to the free cash flow theory, debt decreases agency cost with free cash flow (Jensen 1986). According to asymmetric information, profitable firms increase their debt ratio to send a signal for outside investors. However, the free cash flow theory means positive association within profitability and leverage (Reinhard & Li, 2010; Leland & Pyle, 1977; Chiang et al., 2010;

Margaritis & Psillaki, 2007; Jordan et al., 1998). Frank & Goyal (2009) indicated that to reduce cost of financial distress, firms try to accelerate their leverage to receive favor from tax benefit. Margaritis & Psillaki (2007) argued that there is a significant relation within these two variables.

Profitable firms can internally increase their funds to use retained earnings when they have to maintain a constant debt-equity portion (Booth et al., 2001). But less profitable firms have not that much choice to avoid debt financing and increase the fund internally. Profitable firms have more internal resources to reduce debt ratios in order to leverage ratios. Creditors willingly give loans which firms have high current cash flows (Rajan & Zingales, 1995). Total assets scale the profitability with operating income. However, these two research groups indicated that there is an existence of inverse relation within leverage and profitability. Many more researchers got negative relation between leverage and profitability (Supanvanij, 2006; Sheikh & Wang, 2010; Sayilgan et al., 2006). Guney & Paudyal (2002) tried to find out something in the context of Europe (France, Germany and UK) and found a positive relation in Germany but got a negative relation in UK and France. According to pecking order theory, Akita (2005) investigated in the context of Australian multinational and domestic firms and got a negative result from both multinational and domestic firms. Profitable firms have less debt and short-term cash flow of firms are impaired on consecration and paying debt (Huang & Song, 2006; Gaud et al., 2005; Sheikh & Wang, 2011; Fama & French, 2002; Viviani, 2008; Kim et al., 2006).

To determine capital structure, profitability is inappropriate (Sayeed M. A., 2011). Abor (2005) told that a positive association in short term debt and inverse relationship in long term debt between leverage and profitability. According to Pecking order theory, there is an inverse relation between profitability and leverage (Tong & Green, 2005; Huang & Song, 2006; Frank & Goyal, 2009). In this study, profitability is defined as net profit before tax divided by total assets. Following the majority of the findings the hypothesis regarding profitability has been formulated as:

H3: Profitability is a determinant of capital structure.

Growth Opportunities

According to asymmetric information, firms should avoid to issue new equity if the firms have dynamic potentiality because market does not appreciate their stocks. As per the market timing theory, issuing equity is acceptable when price to book ratios are high (Baker and Wurgler, 2002). It implies a company's growth potentiality (Myers, 1977). Rajan & Zingales (1995). Firms should use more equity financing if it has a good level of growth, whereas above leveraged firms can deny positive NPV benefit.

According to pecking order theory, if a firm has a constant level of profitability and the firm wants a quicker growth then it is mandatory to use more debt. It supports a positive association within growth and leverage. On the other hand, trade off theory predicts that growth company has a huge risk of losing its market value if it fell into economical problem (Myers, 1977). So, it indicates that growth has an inverse relation with leverage (Myers, 1977; Rajan & Zingales, 1995). Companies borrow more to achieve their growth opportunity and decrease the shareholders benefit which is related with agency problem. Although Chen (2004) confirmed that trade off model does not applicable for the Chinese firms because of poor technology (Zou & Xiao, 2006; Eriotis et al., 2007; Deesomsak et al., 2004). Reducing agency conflict, firms should borrow less money even if they have a huge chance of growth opportunity. Agency cost may support an inverse relation within growth and leverage because of more or less investment and asset implantation problem (Frank & Goyal, 2009)). Shareholder can use the debt as a systematic way for minimizing over investment and preventing negative NPV investment though this systematic character of debt is not pursuing for growth firms (Frank & Goyal, 2009; Jensen, 1986). Similarly, G7 countries that there is a negative relation between these two variables (Rajan & Zingales, 1995).

More growth opportunity firms will utilize the most leverage (Chen, 2004). Signaling theory assumes that a positive correlation with growth and leverage. UK firms have a positive relationship between two variables (Bevan & Danbolt, 2000). Titman & Wessels (1998) and Chen (2004) also got positive relation within growth and leverage.

A good number of studies confirmed that (Eriotis et al., 2007; Sayilgan, 2009; Karadeniz et al., 2009; Gued et al., 2003; Akhtar & Oliver, 2009; Buferna et al., 2005) the association within growth opportunities and debt ratios is not positive. In some other studies, the researchers (Ooi, 1999; Huang & Song, 2006) found that there is no significant relationship between growth opportunities and debt ratios. Chen (2004) and Buferna et al. (2005) used the percentage change of total assets as a representative for firm growth. This study also uses percentage change in total assets as a proxy to growth opportunities for firms. This study takes the following hypothesis to test the relationship between growth opportunities of firms and capital structure.

H4: Growth Opportunity is a determinant of capital structure.

Non-debt Tax Shield

According to trade off theory, firms should prefer more debt because it gives precious interest tax shield and raises income after taxes whereas the interest cost is excluded. A firm gets advantage from higher tax bracket if it has excessive borrowing. Trade off

theory predicts firm leverage is negatively related with non-debt tax shield (Frank & Goyal, 2009). Non debt tax shield delegates that investment tax credits, net operating loss carry forward, depreciation expense should be negatively associated with leverage. Firms will have less debt if they have a large number of non-debt tax shields. A firm motivation to increase the slope of the debt tax (Antoniou et al., 2008). DeAngelo and Masulis (1980) confirmed that on debt financing, non-debt tax shield works as a substitute of tax shield. However, firms are awaited to use low debt in their capital structure. Lim (2012) and Antoniou et al. (2008) supported that empirical findings are mixed. Bradley et al. (1984) found that there is a strong relation within leverage and relative amount of non-debt tax shield. To measure non-debt tax shield, Wald (1999) suggested the depreciation ratio divide total assets. Similarly, the sum of depreciation ratio and investment tax credits divide total assets to measure (Chaplinsky & Niehaus, 1993).

Ozkan (2001) and Wiwattanakantang (1999) got a negative relation with debt and non-debt tax shields. Titman and Wessels (1988) reported that no favor is available on debt ratios to raise non-debt tax shield. Bauer (2004) indicated less significant inverse association within leverage and non-debt tax shield. Deesomsak et al. (2004) and Wald (1999) found a significant negative relationship between non-debt tax shield and leverage. Another study reveals that short term debt ratios and non-debt tax shields are significantly negatively related (Viviani, 2008). On the other hand, AL-Shubiri (2010) and Graham (2006) showed a positive association within non-debt tax shield and leverage. This study defines non-debt tax shields as depreciation expenses divided by total assets and has taken the following hypothesis to test the relationship.

H5: Non- debt tax shields is a determinant of capital structure.

Risk

In capital structure, risk has an important role (Baranoffetal, 2007). Risk means the chance of loss occurring and the damage of earnings. Risk is defined as the volatility of cash flows or gaining expectation of a firm. Theory of finance assumes that firms should not be highly leveraged who have a huge possibility of default (Titman and Wessels, 1988; Wiwattanakantang, 1999). So, it indicates that risk is negatively related with leverage. A firm who has a huge risk of earnings is closer to go bankrupt and has less loan capability for lend. Jordan et al. (1998) found that higher market growth has a positive relation with market value of debts and risk. Because firm's debt is increased by bankruptcy risk. Omran and Pointon (2009) investigated risky firms have lots of long-term debt. Ezeoha (2011) concluded that debt has no significant relation with risk. Several researchers found the absence of association within risk and debt ratios (Su,

2010; Viviani, 2008; Cassar and Holmes, 2003). Gaud et al. (2005) resulted that there exist a positive association within leverage and business whereas profitability and growth are inversely related with leverage. Several scholars have shown that risk is inversely related with capital structure (Abor and Biekpe, 2009; Chung, 1993; Sheikh and Wang, 2011).

Trade off theory assumes firm should ignore debt financing when it has highly essential cash flows. It reflects an inverse relation with firm leverage and risk. Frydenberg (2004) suggested that firms having low debt ratios have high business risk to ignore falling in economic distress for the higher volatility in their income. Myers (1977) pointed that risky firms prefer more borrowing than safe firms. Packing order theory assumes inverse relation while agency cost supports positive relationship. Harris and Raviv (1990) concluded that systematic risk is increased by the higher volatility to reduce the prospect of issuing new equity. Bauer (2004) and Titman and Wessels (1988) found no significant relation with risk and leverage. On the contrary, Kim and Sorensen (1986) found a positive relation. This study defines risk as change in current profitability and has taken the following hypothesis to test:

H6: Risk (Business & Firm) is a determinant of capital structure.

Liquidity

Liquidity is considered by the total current assets over the short-term liabilities. De Jong et al. (2008) confirmed that liquidity is the sum of cash and other liquid assets which is firstly served in firms against debt. According to trade off theory, if companies have higher liquidity, they should borrow more money to meet their economic constraint on time. However, trade off theory supports a positive relation between liquidity and leverage (Ross 1977). According to packing order theory, firms should not use external funds for financing new investment opportunities when they have huge liquidity (Myers, 1984). Rajan and Zingales (1995) and Titman and Wessels (1988) showed an inverse association between liquidity and leverage. So, packing order theory indicates an inverse relation and many researchers supported it (Mazur, 2007; Viviani, 2008; Eldomiaty & Azim, 2008; Deesomsak et al., 2004). Bevan & Danbolt (2002), Kim et al. (1988), Opler et al. (1999) concluded that high liquid firms propose to use internal financing rather than external financing. This study has taken the following hypothesis to test the relationship between liquidity and leverage.

H7: Liquidity is a determinant of capital structure.

Age of Enterprise

On capital structure, age of enterprise is an important determinant to calculate the debt repayment and risk-taking behavior. Actually, the age of enterprise is calculated by its

establishment and operation year. Older firms with big reputation are more experienced to collect debt and using it in the best possible way. According to trade of theory, age is a key determinative of a firm's reliability and predicts positive relation. Pecking order theory indicates that companies maintain their payment over the time. Aged organizations have a large amount of accumulated retained earnings, and less reliance on external financing to complete their financial conformity comparatively young firms. Harris and Raviv (1991) found that creditors lend them money by observing their past record of repayment of debt reputation and lower borrowing cost is depended by the reputation. Usually old firms with reputation try to invest in safer project to avoid losing their prestigious goodwill. But young firms with less fame may choose the risky project. Empirical evidence shows that a mixed prediction about leverage and age of enterprise. Johnson's (1997) investigated that a positive result between age of debt and leverage. On the contrary, Ramjee and Gwatidzo (2012), Petrunia (2010), Ahmed et al. (2010) found an inverse association within leverage and age of debt. Cheng et al. (2011) resulted that there might be a positive or negative accociation between leverage and age of enterprise. This study has taken the following hypothesis to test any relationship between age of enterprise and leverage.

H8: Age of enterprise is a determinant of capital structure

Dividend

According to packing order theory, a firm with prosperous growth opportunities may not have a high dividend payout ratio. Dividend payments carry a positive gesture about the firm's financial health and the capability of using more debt. It notices a positive association within debt and dividend. Frydenberg (2004) found that paying large amount of dividends indicate a positive gesture on the market about the firm's efficiency on the future investments without using more debt. Constant dividend payments raise the necessity of issuing more debt to decrease the amount of internal fund. So, Ali (2011) supports a positive relation between dividend payout ratio and debt. Frydenberg (2004) investigated that when a firm promises dividend payments, negative impact may occur in the long-term debt and total debt. As opposed to, Frydenberg (2004) also found that there is a positive association within dividend and short-term debt. Bhaduri (2002) found that agency models regard debt and dividend payment as an alternative in preventive agency problems. Frank and Goyal (2009) concluded that dividend paying firms taking care of low debt ratios rather than non-dividend payers. The following hypothesis has taken to find out any relationship between dividend and leverage.

H9: Dividend is a determinant of capital structure.

Product Uniqueness

Customer tries to realize that less levered firms produce special unique products (Titman 1984). Product uniqueness measured that R&D and selling expenses divided by total sales (Titman and Wessel, 1998). Those firms are more innovative compare to others who invest huge amount of money in R&D sector. Kale and Shahrur (2007) mentioned that firms try to utilize lower debt to show relation with specific investment when the question comes about firms' economic choices and behavior of customers and suppliers. Some firms try to rely and depend on their suppliers to further extend so that their customer leverage ratio is lower compare to others (Banerjee, Dasgupta and Kim, 2008). On the other hand, in Dutch listed firms, there is no significant association within product uniqueness and leverage (De Jong and van Dijk, 2001). In this study, product uniqueness is defined as cost of sales divided by net revenues from sales. Understanding the connection between capital structure and product uniqueness, the following hypothesis has been taken to test:

H10: Product uniqueness is a determinant of capital structure.

Agency Cost

Agency costs emanate from agency relationships that arise because of separation of ownership and management. Though the presence of the debt decreases the equity level, it occupies maximum level of insider ownership (Jensen and Meckling, 1976). Similarly, managers get restricted to any decision, for the existance of debt in capital structure (Jensen, 1986). Sometimes managers feel overawed to enable to pay future dividends so that they involved with debt rather than paying dividends. Easterbrook (1984) in the study of agency cost expectation of dividends argues that manager are forced by debt financing to increase the firms value external capital market monitoring compare to personal value. In this study, agency cost is measured by sales divided by total assets and the following hypothesis has been taken to test the underlying relationship:

H11: Agency cost is a determinant of capital structure.

4. Research Methodology

This study has applied a quantitative form of analysis based on the information published through general purpose financial statements. Considering the age of listing and presence of debt in capital structure, the study has taken 27 companies out of 113

companies listed in Dhaka Stock Exchange (DSE) across three industries as mentioned in the table below:

Table 3: Sample of the companies studied

Industry	Population	Sample	%
Banks	30	10	33
Textiles	52	9	17
Pharmaceuticals	31	8	26
Total	113	27	24

Most of the data required for the study have been captured from financial statements of the sampled companies for five years from 2012 to 2016. The factors used in this study have been mentioned in the table below with their operational definitions.

Table 4: Variables used in the study

Factors	Notations	Operational Definitions
Dependent Variable:		
Capital Structure	LEV	Long term debt divided by total assets
Independent Variables:		
Tangibility of Assets	AT	Fixed assets divided by total assets
Growth Opportunities	GTA	Percentage change in total assets
Risk	RISK	Change in current profitability
Product Uniqueness	UNIQ	Cost of sales divided by net revenues from sales
Liquidity	LTY	Ration of current assets to short term liabilities
Age of Enterprise	AGE	Number of year since listing
Agency Cost	AC	Sales divided by total assets
Dividends	DIV	Dividend payout divided by net income before taxes
Firm Size	SIZE	Natural logarithm of sales
Profitability	PRT	Net profit before tax divided by total assets
Non-debt Tax Shields	NDTS	Depreciation expenses divided by total assets

As per the factors identified above, relevant data have been captured for all the sampled firms across five years. Deriving the existing association within dependent & tagged independent variables have performed in the discussion a typical order of Ordinary Least Square (OLS) regressions is undertaken. Capital Structure is dependent variable and is attached with figure of independent variables to the discussion what really

determines the capital structure of a firm. The consequence of equation is formulated for the study:

$$LEV_{i,t} = \alpha + \beta_1 SIZE_{i,t} + \beta_2 AT_{i,t} + \beta_3 PRT_{i,t} + \beta_4 GTA_{i,t} + \beta_5 NDS_{i,t} + \beta_6 RISK_{i,t} + \beta_7 OST_{i,t} + \beta_8 LTY_{i,t} + \beta_9 AGE_{i,t} + \beta_{10} DIV_{i,t} + \beta_{11} UNIQ_{i,t} + \beta_{12} AC_{i,t} + \varepsilon_{i,t}$$

Where,

$LEV_{i,t}$ represents capital structure of i^{th} company in period t

$SIZE_{i,t}$ represents firm size of i^{th} company in period t

$AT_{i,t}$ represents tangibility of assets of i^{th} company in period t

$PRT_{i,t}$ represents profitability of i^{th} company in period t

$GTA_{i,t}$ represents growth opportunities of i^{th} company in period t

$NDS_{i,t}$ represents non-debt tax shields of i^{th} company in period t

$RISK_{i,t}$ represents risk of i^{th} company in period t

$OST_{i,t}$ represents ownership structure of i^{th} company in period t

$LTY_{i,t}$ represents liquidity of i^{th} company in period t

$AGE_{i,t}$ represents age of enterprise of i^{th} company in period t

$DIV_{i,t}$ represents dividends of i^{th} company in period t

$UNIQ_{i,t}$ represents product uniqueness of i^{th} company in period t

$AC_{i,t}$ represents agency cost of i^{th} company in period t

$\varepsilon_{i,t}$ represents error term for i^{th} company in period t

5. Analysis and Findings

The section presents the analysis and related findings with reference to prime objective of this study. Table 5 below begins with the correlation analysis within variables used in the study to understand their inherent relationship. The coefficient between risk and profitability comes out to be .000 showing no relationship between them. In all other cases, the variables are either positively or negatively correlated. It indicates that the variables have significance in understanding their impact on dependent variable, i.e., capital structure.

Table 5: Pearson Correlation Coefficient

	Capital Structure	Asset Tangibility	Profitability	Growth Opportunities	Liquidity	Firm Size	Product Uniqueness	Risk	Non-Debt Tax Shields	Age of Enterprise	Dividends	Agency Cost
Capital Structure	1.000											
Asset Tangibility	.225	1.000										
Profitability	-.070	.158	1.000									
Growth Opp.	-.111	-.050	-.057	1.000								
Liquidity	.254	.156	.103	.180	1.000							
Firm Size	.258	.795	.218	-.120	.353	1.000						
Pro. Uniqueness	-.243	-.305	-.132	.086	-.203	-.516	1.000					
Risk	-.017	.028	.000	.019	-.068	.025	-.010	1.000				
ND Tax Shields	.091	.293	.104	-.088	.111	.312	-.005	.098	1.000			
Age of Enterprise	.053	-.112	-.069	.070	-.104	-.092	.040	.061	.084	1.000		
Dividends	-.215	-.532	-.122	.087	-.207	-.641	.172	-.082	-.228	.131	1.000	
Agency Cost	.048	.292	.124	-.181	.067	.603	-.293	.115	.244	.164	-.409	1.000

The next table (Table 6) is showing that multiple linear regression model gist and in total fit statistics. The study has found that adjusted R^2 of this model is .121 with the R^2 of .195. It means that the linear regression only interprets 19.5% of the variance in the data in this study which is very small. The Durbin-Watson d equals 1.960, which is between the two critical values of $1.5 < d < 2.5$. Furthermore, we can predict that there is no first order linear auto-correlation in our multiple linear regression data.

Table 6: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.442	.195	.121	.08650	1.960

The next output table shows the result of the F-test. The F-test of linear regression has the null hypothesis that the model illustrates zero (0) variance in the dependent variable (in other words $R^2 = 0$). The F-test is highly significant, thus we can predict that the model interprets a significant quantity of the variance in capital structure.

Table 7: ANOVA Table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.218	11	.020	2.646	.000
	Residual	.898	120	.007		
	Total	1.116	131			

The above table explains that the regression model assumes the dependent variable significantly in good health. The table specifies the statistical implication of the regression model that was run. Here, $p < 0.0005$, which is less than 0.05, and specifies that, generally, the regression model statistically expressively forecasts the consequence variable (i.e., it is a decent fit for the data). On the other hand, the coefficient table (Table 8) below delivers us with the essential evidence to expect capital structure from respective independent variables, along with determine whether they contribute statistically meaningfully to the model (by observing at the "Sig." column).

Table 8: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.071	.058		1.219	.225		
Asset Tangibility	.043	.056	.125	.774	.441	.258	3.881
Profitability	-.042	.026	-.138	-1.641	.103	.945	1.058
Growth Opportunities	-.046	.025	-.162	-1.871	.064	.891	1.122
Liquidity	.016	.007	.233	2.376	.019	.700	1.429
Firm Size	.000	.004	-.011	-.047	.962	.117	8.543
Product Uniqueness	-.014	.007	-.193	-1.879	.063	.635	1.576
Risk	-.002	.014	-.009	-.112	.911	.960	1.042
ND Tax Shields	.027	.106	.023	.258	.797	.835	1.197
Age of Enterprise	.001	.001	.145	1.662	.099	.877	1.140
Dividends	-2.077	.000	-.158	-1.419	.159	.543	1.842
Agency Cost	-.023	.018	-.159	-1.283	.202	.437	2.291

Moreover, we be able to practice the values in the "B" column under the "**Unstandardized Coefficients**" column to present the regression equation as:

$$\text{Capital Structure} = .071 + .000(\text{SIZE}) + .043(\text{AT}) - .042(\text{PRT}) - .046(\text{GTA}) + .027(\text{NDTS}) - .002(\text{RISK}) + .016(\text{LTY}) + .001(\text{AGE}) - 2.077(\text{DIV}) - .014(\text{UNIQ}) - .023(\text{AC})$$

As per the beta values, four (asset tangibility, liquidity, non-debt tax shields and age of enterprise) out of eleven variables shows positive; six (profitability, growth opportunities, product uniqueness, risk, dividends, and agency cost) shows negative relationship and one (firm size) shows no relationship with capital structure. Further to the analysis, none of the variables become statistically significant at $p < .05$. The statistics in the table above too agrees us to check for multicollinearity in our multiple linear regression model. Tolerance for all the variables is more than 0.1 and VIF is less than 10 which confirms the non-existence of multicollinearity in our investigation.

An important way of having a detailed look at what is *left over* after clarifying the difference in the dependent variable using independent variable(s). For this purpose, we can check for normality of residuals with a normal P-P plot. The plot displays that the points usually track the normal (diagonal) line with no strong deviations. However, here we have produced residuals statistics from our analysis showing the mean (zero) and standard deviation (one) of predicted value and residual which confirms the presence of normality.

Table 9: Residuals Statistics

	Minimum	Maximum	Mean	Standard Deviation	N
Predicted Value	-.0308	.2131	.0783	.04077	132
Residual	-.14206	.28738	.00000	.08279	132
Standard Predicted Value	-2.675	3.305	.000	1.000	132
Standard Residual	-1.642	3.322	.000	.957	132

Based on the analysis, we can summarize the findings in the table below:

Table 10: Test of hypothesis

Hypothesis	Relationship	Significance	Theory Supported
H1: Firm's size is one of the major determinants of Capital Structure.	No relationship	Not significant	Not supported
H2: Tangibility of asset is a determinant of capital structure.	Positive	Not significant	TOT
H3: Profitability is a determinant of capital structure.	Negative	Not significant	POT
H4: Growth Opportunities is a determinant of capital structure.	Negative	Not significant	TOT

Hypothesis	Relationship	Significance	Theory Supported
H5: Non- debt tax shields is a determinant of capital structure.	Positive	Not significant	Not supported
H6: Risk (Business & Firm) is a determinant of capital structure.	Negative	Not significant	TOT
H7: Liquidity is a determinant of capital structure.	Positive	Not significant	TOT
H8: Age of enterprise is a determinant of capital structure	Positive	Not significant	TOT
H9: Dividend is a determinant of capital structure.	Negative	Not significant	TOT
H10: Product uniqueness is a determinant of capital structure.	Negative	Not significant	TOT
H11: Agency cost is a determinant of capital structure.	Negative	Not significant	Not tested before

As already pointed out, ten independent variables show either positive or negative connection with capital structure leaving only one with so such relationship. However, none of the relationship becomes statistically significant. At the same time, the study confirms the application of Trade off Theory in most of the cases. Agency cost has not been tested before aligning with theories and this study shows a negative association. Firm size and non-debt tax shields don't support the pervious findings. And, profitability confirms the Pecking Order Theory.

6. Conclusion and Recommendation

Capital structure decision is a significant choice in financial management area. Reaching to optimal capital structure was a primitive focus in finalizing the debt-equity ratio. However, the focus of studying capital structure decisions moves to the identification of the determinants of capital structure. This study is not any exception. An extensive literature review selects a host of determinants (eleven) and the study applies quantitative form of study to understand the association between the determinants and capital structure. The study results a poor model with a very less explanatory power, though it passes goodness-of-fit test and doesn't show the presence of any multicollinearity in it. The study also tries to validate the findings based on the theoretical framework of the study.

The major limitations of the findings are that only a sample of companies has been considered in this study. Only five years data have been captured to prepare the dataset which limits the applicability of the findings. At the same time, the findings raise question on the justification of such week relationship between capital structure and selected independent variables. In countries like Bangladesh, the outside the firm factors may

have more explanatory power than variables which are firm specific. Cultural, political and behavioral factors need to be researched under qualitative research paradigm capturing some in depth interview from finance managers who deals with capital structure decision. It may develop a new profile of determinants affecting capital structure decision.

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