Thesis Report

On

Determinants of Capital structure: A study on non-manufacturing firms in Bangladesh

By

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A thesis report submitted to the BRAC Business School in partial fulfillment of the
requirements for the degree of
Bachelors of Business Administration

BRAC Business School
BRAC University
September 2020

Declaration

It is hereby declared that

1. The thesis submitted is my/our own original work while completing degree at BRAC University.

2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.

3. The thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.

4. I/We have acknowledged all main sources of help.

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Approval

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Subject: Submission of thesis on "Determinants of Capital structure: A study on non-manufacturing firms in Bangladesh".

Dear Sir,

With due respect, I would like to submit my thesis on the topic: *"Determinants of Capital structure: A study on non-manufacturing firms in Bangladesh"*. In BUS400 course it is required to do a thesis or internship report to complete undergraduate studies in BRAC Business School. Here, I am doing thesis for the competition of BBA program.

This study reflects how some certain determinants can affect the capital structure decisions for selected Bangladeshi non-manufacturing firms of different sectors. I have incorporated both empirical studies and previous literature studies to establish my stand.

I have tried my level best to complete this thesis as per the university requirements under your guidance. Your direction as a supervisor have been indispensable to make this report both detailed and concise within a very short span of time as possible. I shall be honored if you accept this report and provide necessary suggestion.

Sincerely yours,

_____

Nafisa Ali

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Date: September 27, 2020

Acknowledgement

An extraordinary joy is that I am capable of expressing my absolute gratitude to the Almighty for allowing me to complete the thesis in due time even in the pandemic situation. It was a daunting task. Without some significant people's help, accomplishing this thesis would have been very difficult for me as BRAC University is giving the opportunity of doing a Thesis instead of Intern for the first time. After that, I would like to thank a few people who helped me the whole way.

My first and foremost sincere gratefulness is towards Dr. Suman Paul Chowdhury, my thesis advisor, whose support and help has been remarkable and instrumental. Exceptionally even after all the hectic schedules of the online semester, he guided me continuously and gave me valuable feedback from time to time. His structural guidance and assistance, therefore, played an immense preface towards the successful end of this thesis. I am truly indebted to him for all of his contributions.

Secondly, I sincerely acknowledge the contribution of a few senior mentors and my fellow thesis writers. They gave their valuable suggestion on different aspects of my study whenever I approached them. Next, my parents, who always have created a calm environment for me so that I can completely concentrate on my writing.

Last but not the least, I would like to express my gratitude and respect towards BRAC University. I am extremely indebted to all the scholar faculties of BRAC Business School who shared their vast knowledge and enlightened me, which made me capable to face the corporate world in the last four years. Along with that, I am equally thankful to every other individual who helped me to be a better person each day during this journey. I would consider myself very much fortunate to be able to carry these lessons that I have gathered from all the respected

faculties and individuals throughout my life and always try to imprint myself as a worthy graduate of BRAC Business School.

Executive Summary

The determinants of a firm's capital structure decisions may vary across countries. Determinants that affect significantly in a developing country, such as, Bangladesh, may affect differently for a developed country. Industry type, industry structure, government policies may impact here. This report titled: *"Determinants of Capital structure: A study on non-manufacturing firms in Bangladesh"* aims to investigate those determinants of capital structure that create value in leverage decision making procedure for Bangladeshi firms. I have randomly selected 100 listed non-manufacturing firms from the Dhaka Stock Exchange (DSE) over a five year period from 2015 to 2019 and obtained necessary secondary data. I have conducted a descriptive analysis, correlation matrix and regression analysis to obtain a clear view on the relationship of capital structure and its determinants. I have used both book based leverage and market based leverage in my study. Finally, the outcome of this study concludes that, firm size and growth can both have positive and negative relationship for *mktlev* model and *booklev* model respectively, performance may have positive and negative relationship for *booklev* and *mktlev* model respectively with capital structure for Bangladeshi firms. The other two determinants name tangibility and listing age have only positive relationship with capital structure. Due to time limitation, I couldn't focus more in sample selection. Despite of this, I hope my findings will surely help others who wish to research on this topic in developing countries.

Keywords: Capital structure; firm size; performance; tangibility; growth opportunity; listing age; debt; firm- year.

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List of Acronyms

cs   Capital Structure

roa   Return on Assets

mktlev   Market Leverage

tangibil   Tangibility

MTT   Market Timing Theory

DSE   Dhaka Stock Exchange

OLS   Ordinary Least Square

RMSE   Root Mean Square Error

Glossary

Thesis

An extended research paper that is part of the final exam process for a graduate degree. The document may also be classified as a project or collection of extended essays.

Capital

Refers to the factor that affect firms leverage decision.

Structure Determinant

Part A: Student Whereabouts

1.1 Basic Information

This is Nafisa Ali, Id-16304087. I started my education journey at BRAC University back in 2016's Spring with BRAC School of Law. I was there for the first two consecutive semesters. I wanted to be a Magistrate. Later I found a career in law does not suit my personality. I am more of an introvert person. From my early college life, I was very much passionate about Finance; hence, I decided to enroll in the BBA program here. Finally, I started my journey with BRAC Business School from Fall'2016 to pursue my undergraduate degree.

1.2 Concentrations

According to university policy, we have to select major minors based on the individual choice to complete the BBA program. One can do a minor or major from a different department also. Likewise, at one point of the study I found Economics and Finance are a great combinations, and so I decided to do a minor in Economics. However, in BRAC University since Economics is a different department so it was required to complete a number of pre-requisite courses. I did one and suddenly realized this minor will not add value in my career if I don't do major. Doing such major is a time- consuming and authority barely allows. So then lastly I have decided to do double major. One is Finance and another one is Human Resource Management. As I mention earlier, I am much passionate about Finance so this has supposed to be my first major. The reason why I choose Human Resource is this is quite related to administration. My father always wanted me to study something related to this area. And while accomplishing my second major I found HR is quite interesting.

1.3 Other Intern Scope & Limitations

During this pandemic organization's Human Resource is in freeze condition as firms are making profit hardly. Recruitment of new fresher's falls greatly and laying off increased hugely. Apart from this even if some companies mainly start-ups are hiring but they wish to work from the office regularly. Many families don't allow to go out and work as in Bangladesh, the situation is not that good. And this was one of my biggest limitations that instead of getting some good intern offers I could not join. Hence I choose to do a thesis instead to complete my BUS400 course which is the last course that we all have to in order to complete the undergraduate study.

This the first time when BRAC Business School is offering Thesis/ Case Studies alongside Internship. So it's genuine that we all are new in that phase. Also, the time of this semester shortened so there is a huge rush for both students and faculties.

Part B: Determinants of Capital Structure: A study on non-manufacturing firms in Bangladesh

Chapter 1: Introduction & Research Objective

1.1 Introduction & Research Objective

Capital structure is the outstanding of both debt and equity. It permits a firm to recognize what sort of arrangement a company does to finance its overall operational activities and growth. A mixture of both debt and equity runs the firm collectively. However, this study will analyze the importance of various determinants of building the capital structure of firms under Dhaka Stock Exchange. Capital structure will be measured by book leverage and market leverage. A proper capital structure always invigorates the profitability of company.

Making financial decisions for any firm is very decisive and financial personnel often face dilemmas while deciding the proportionality of debt and equity. Basically, there should be a proper balance among debt and equity while taking the decision in order to assist the interest of the equity shareholders. A company may manage a portion of long term funds by taking loan in the form of bond, debenture and so on, instead of collecting it from shareholders. Although it will incur a fixed annual charge, however this payment is considered as overheads to an entity. In this way interest of ordinary shareholders is served more accurately. Some more significance of designing a proper capital structure is- rise of share price in stock market, maximizing firms value & cost , opportunity to invest market, development of a nation.

Forming a capital structure always involves a settlement chain between those who have interest in a cluster of firm, and there every single party aims to make the most of its benefit. For instance, to talk about managers, this may point towards more responsibilities and control over business. While the shareholders chase for better price of the company. Often firms

management body, utilize the power of using free cash flow for their own benefits but with shareholder's expense. This happens when clashes of interest arise between all managers and shareholders. On this point, Stulz (1990); Harris and Raviv (1990); Zwiebel (1996) very knowledgeably claimed that to reduce conflicts or clashes debt can be a useful equipment, since by the refunds of the debt manager gets the idea of how much more conservative and cautious he has to be with excessive investments. In another framework, it is argued that for increasing firm's performance using debt is not a considerable option for long term (Majumdar and Chhibber, 1999). In addition, Jensen (1986) established that to lessen the management monitoring cost leverage is a good way. Henceforth, firm for the sake of their interest would limit the important cash disbursement through reducing the cash flow.

Also, under investment, issue may arise between investors as they would give up projects in net present value that might be beneficial for the creditor, but at the same time the investors would prejudice, and the dispute of demanding more interest rates as the assumption of risks only specialized on assets which are purchased by creditors (Myers, 2001). The assumption of the proportion of debt is a stagnant starting point of most of capital structure model. However, in case of actual economy, based on firm's value a firms always adjust the debt level. Goldstein et al. (2001) found that even though contractual agreements protect the creditors, still firms can contract fresh credits and they don't have to switch off the current debt amount.

The market timing theory (MTT) assumes that monetary decisions are changing time to time without any ideal capital structure (Baker and Wurgler, 2002). The capital structure should be known as per the outcome of historical funding decision process.

MTT suggests that depending on the market conditions companies shall decide whether to issue new shares and in this way it can create impact for the future, as adjusting debt is not a single goal (Hovakimian, 2006). Firms involving external resources if their assessments were

unfavorable are more liable, then firms who have gathered capitals at the time when they have estimated high value then actual (Baker and Wurgler, 2002). At the same time, Kayhan and Titman (2007) studied that if the forecasted share price is high, firms tend to attract more capital, and conversely if it's predicted that share price will fall, then firms go with the liability option. This way, it can be said that these choices of capital market and the variations may face consequences in the long run on their monetary structure. Additionally, disparities of shares price and liability charge triggered manager to make these decisions (Baker and Wurgler, 2002). Among many fundamentals, prime one for the financial strategy is the selection and usage of capital (Velnampy & Aloy Niresh, 2012). A good corporate governance & capital market, financial arbitrator and security for anticorruption offered by a country can ensure that debt has been used successfully. It's genuine that company might have numerous accomplishments, for instance, revenue and wealth generation, to promote growth and to make sure these task place perfectly, financing is known as the chief among all (Velnampy, 2006).

After Modigliani and Miller (1959), different scholars initiated to investigate the factors that capital structure of a firm for their respective countries. Leland (1994), Mahmood and Suhaila (2008) well studied the aspects of capital structure and established that firm size, quantity of fixed assets, profitability and interest charges affect the firm's financial verdict. According to Fisher, Heinkel, and Zechner (1989), market friction should not only determine the fund collection decision rather it should also contain manager and shareholder conflict. He further mentioned that these market frictions are liquidation costs, cost of refinancing and lastly tax. Although in terms of financing decisions, the issue of an agency being conflict has been extensively discussed till the time.

1.2 Research Objective

The prime purpose of this research is to identify the determinants (*Firm Size, Firm Performance, Growth Opportunity, Tangibility and Listing Age*) of capital structure for selected Bangladeshi firms. Reviewing the determinants of capital structures in Bangladeshi organizations is very important as we will be able to explain how non-manufacturing firms should behave when making financial decisions and also it will allow us to compare the obtained results with other developing economies. Thus, the outcome is expected to add more value with existing researches in this field.

Chapter 2: Review of Literature & Hypothesis Development

Miguel and Pindado (2001) found that to know more about the determinants of capital structure, a study on firms as well as countries, arrangements, and features can be helpful. Each aspect may shake the corporate capital structure policy. De Jong et al. (2008) discovered that capital structure can vary from country to country, depending on the accurate facts of a particular industry or firm. Every individual factors of each country impact indirectly on the capital structure since they also have some stimulus for specific factors at the firm level. According to the present literature, factors determination of capital structure mostly has been done based on developed countries' stock market.

In spite of this, developing countries' monetary market literature is quite extensive lately. Rivera (2007) carried out a fine study on the small and medium enterprise in Colombia; Bhaduri (2002), on the Indian corporate market; Chen and Strange (2005), on Chinese corporations; Correa et al. (2007), in Brazilian factories; Crnigoj and Mramor (2009) on firms from Slovenia; Kim et al. (2006), on South Korean firms; Fernandez (2005), Omet (2006) focussed on stock markets in Jordania; Salawu and Agboola (2008), on Nigerian enterprises; Shah and Khan (2007), on Pakistani companies; Vasiliou and Daskalakis (2009), on Greek firms; Pandey (2001) on Malaysian market; Delfino (2006), on Latin America, Wiwattanakantang (1999), concentrated on Thai enterprises. A common way of measuring capital structure is the leverage that consists of total liabilities to total assets, debt capitalization, and debt to total assets or net assets. Pandey (2001) established altered effects on the category of debt while using these three leverage methods: long-term liability to total assets, short-term liability to total assets, and total liability to total assets.

2.1 Firm Size

Big companies suffer liquidation less mainly as they spent on many projects at a time. When these firms issue equity or debt, they incur comparatively low cost even if they are using a high proportion of debt. On the contrary, small or medium trades can have high levels of short-term debt and low levels of long-term debt with a huge cost because of the conflict between stockholders and lenders which is not certain also (Michaelas et al. 1999, Titman and Wessels 1988). Lasfer (1995) finds an affirmative connection between company size and leverage level, which is very much noteworthy.

However, larger firms release more information to their stakeholders than the smaller firms and so they have lower information asymmetry. That's why larger firms find it easy to appeal for long-term liability than smaller firms. Besides, large firms can have good bargains on credits as they can reach economies of scale easily. Hence, it is argued by Sogorb-Mira (2005) firms are tend to rely on their equity while large firms rely on debt more. Later, the positive connection between size and long-term liability has been confirmed empirically (Huang &Song 2006; Abor, 2005; Sheikh and Wang, 2011).

Empirical studies between firm size and leverage, that we've till now are many questions as they have produced mixed and conflicting findings. A study by Mubeen, Nazam, Batool, and Riaz (2016) accomplished utilizing regression analysis from secondary source data from the year 2008 to 2012 and established that size has positive as well as majorly effect variable on leverage. Some authors have recommended that firm size and leverage ratios are related. Warner and Ang, Chua, and McConnell suggested prior evidence that as a firm's value decreases direct liquidation costs which seems to be a huge organizer of a firm's value. The reason behind this is relatively large firms are always more expanded and fewer chances of being bankrupt.

Although, Kester (1986) says the company size and capital structure are not significant. Moreover, the relationship between firm size and capital structure is always a complex matter for method selection such as OLS, GMM, GLS with others which is found by Barclay et al. (1995), Van der Wijst, and Thurik, (1993) in their study. The choice of capital structure impacts a lot if we use this to measure a firm's size. According to Rajan & Zingales (1995), if a firm in terms of its assets is big then it stands quite a better chance of raising more debt since the lenders can easily claim on the assets of the company if any problem occurs in debt payment.

Based on the discussion above, I predict:

H1: Firm Size is positively related to Capital Structure

2.2 Firm Performance

Firm performance can be defined as an achievement that is obtained by management, economics, and marketing through efficiency and competitiveness to the company (Taouab & Issor, 2019). Both the market where a company operates and the effectiveness determines the main performance. Some prior empirical studies could not show any noteworthy association between capital structure and firm performance. For example, Phillips and Sipahioglu (2004) tested the insignificance theorem of liability by Modigliani and Miller while using data from 43 UK cited organizations. However, they found there was a significant relationship between the debt level in the capital structure and performance level. Furthermore, Krishnan and Moyer (1997) studied 81 Asian corporations and found that country of origin impacts financial performance and capital structure. Besides, they observed that their one study in Hong Kong companies possesses a meaningfully advanced level of ROE and invested capital than their observation for other states. Again, Korean companies have expressively greater leverage than other nations. However, in the end, they got a firm's performance does not influence by leverage only as other factors matter.

Besides, some researchers empirically scrutinized the relationship in developing economies. Majumdar and Chhibber (1999), Chiang et al. (2002) examined the relationship between capital structure and performance on firms belongs to India and Hong Kong's property and construction site correspondingly. Their research showed a negative relationship among debt level and firm performance. Again, Zeitun and Tian (2007), Ebaid (2009) inspected the negative relationship with a firm performance for Jordan firms and Egyptian firms respectively. Abor (2007) studied the relationship between capital structure and performance for small and medium enterprises and showed that capital structure, particularly long-term and total debt level, has no relation with performance in Ghana and South Africa. To review, empirical studies among leverage and firm's performance in established countries delivered diverse and conflicting evidence. Hence for Bangladeshi firms, my developed hypothesis for leverage and performance are as follows:

H2: Firm Performance is positively related to Capital Structure.

2.3 Tangibility

All the durable, touchable, and noncurrent asset of a company is known as tangibility. Tangible assets work a lot as collateral when the firm needs a huge amount of loans from the bank. This means that firms that have enough tangible assets can rely more on debt in their capital structure as they can easily use these tangible assets as collateral for the security of long term debt. Again, this has created differentiation among firms that can access debt for longer terms compared to companies with squat physical assets.

However, according to Myers (1977) when bankruptcy arising from less susceptibility of tangible assets to information asymmetry, that time their value is greater than that of intangible assets as they are associated with low asymmetric information. Hence, they can support the

debt level much more than intangible assets and companies tend to have higher liquidation when the value of tangible assets is higher as well (Haris and Reviv, 1991).

The pecking order theory states that organization tends to issue more equity than debt when they have more tangible assets because tangibility always works to eases asymmetric information that makes a good place on the value of shareholder's equity. Commonly, it has been predicted by the tradeoff theory that there is an optimistic relationship between tangibility and leverage. In recent research by Nasimi (2016) proved the same stance. At the same time, empirical studies among tangibility and leverage produce mixed and contradictory findings that we have till now.

According to tradeoff theory, it says, that that company that has higher tangible asset occupy more chance of issuing more debts the since it can be used as collateral for the debts issued at the time of financial distress (Stulz and Johnson, 1985). Hence, I assume:

H3: Firm's Tangibility is negatively related to Capital Structure.

2.4 Growth Opportunity

Companies that experience fast growth in their sales most of the time need more wealth. As a result, increasing levels of progress in firms create a demand for more cash further in order to gain more profit. Debt and growth are expected to have a positive relationship with a company. Based on crucial costs related to financial problems, the company can either pay debts or it may choose to supply equity to funding necessary investment opportunities (Shyam-Sunder and Myers, 1999). Therefore, growth will create impact the funding as enough funds would be required to mitigate agency problems.

Again, the pecking order theory forecasts an affirmative relationship between growth opportunity and financial leverage. As per pecking order, debt falls drastically when retained

earnings are sophisticated than investment opportunities. Debt is working as a medium between the investment opportunities and retained earnings of a company.

A firm's growth opportunity always indicates capital assets that are significant to a firm but cannot be pledged and never produce present-day taxable revenue. This is the reason for getting a negative relationship between debt and growth opportunities. Growth standards include capital expenditures to total assets where total assets progress is estimated by the percentage alteration in total assets. As companies are more focused on generating profit as well as in research and development to create forthcoming investments, so this research no wonder would serve as an pointer of the growth mark.

Trade-off Theory says the company needs to accommodate more debt to retain debt to equity ratio if retained aids have a high growth tendency. The theory also suggests that when you have more investment opportunity, it brings low leverage with it because of powerful incentives to escape from under-investment related issues and asset swap that can take place due to conflicts among agencies (Drobetz and Fix, 2003). Accordingly, a negative relationship is expected among growth and financial leverage.

Nasimi (2016) discovered in his empirical study that the significance of growth has an effect on capital structure in the USA. In the end, it concludes that growth has no major effect on leverage and it is quite like a mirror of capital structure. As we all know that firms run by equity have an inclination to spend brutally too some extent for snatching capital from its bondholders. Now all the cost related to the agency is quite advanced for firms if it belongs to the emergent industry, as they have many flexible options for future investments. Thus long term debt quantity is supposed to be related negatively with anticipated forthcoming growth.

However, Myers proved that agency problems can be dissolved if the firm provides more short term debt alternative to the long term. This recommends that short term debt ratio can be related

positively with growth rates if developing firms replace short term financing with long term. Jensen and Meckling, Smith and Warner, and Green debated that by issuing transformable debt agency overheads can be lessened. Hence, it can be said now convertible debt ratios are possibly positively related to growth opportunities. Lastly for this, with respect to Bangladesh, my hypothesis is:

H4: Firm's Growth Opportunity is negatively related to Capital Structure.

2.5 Listing Age

Listing age is known as the number of years in of incorporation of a company in the market. The theoretical relationship among a firm's age and capital structure is not clear and well researched. An empirical study by Dewaelheyns and Van Hulle (2010), Sakai et al. (2010), Ezeoha, and Botha (2012) established a significant relationship among firm age and capital structure. Besides, Trade-off Theory and Agency Theory fully support this finding. When a company operates for a long time in a market, they tend to have more knowledge of borrowing form that particular market. They often have a longer term of relationship with borrowers and creditors always keep track records of these companies.

Conversely, Petersen & Rajan (1994) and Michaelas et al. (1999) found that usage of debt financing decreases with a firm's age and this statement is paralleled with Pecking Order Theory. The reason is firms that are not operating for a longer time or new, tend to manage their expense by themselves rather using debt financing. In Bangladesh, the number of this type of new firm is much more as it is a developing nation. This my hypothesis here is:

H5: Firm's Listing Age is positively related to Capital Structure.

Chapter 3: Methodology

3.1 Sample

Based on probability, population simplification is done from collected data by using a sample of that population. It is very much significant to select samples of sufficient size for generalizing the research finding to the population. Large sample size will improve the quality of the research as more data will be there. However, for time shortage we are not going after a large data set. According to Saunders, Lewis, and Thornhill (1996) too indicated that the greater the sample proportion, the lesser the probable inaccuracy in generalizing population. The Dhaka Stock Exchange (DSE) has 591 companies representing 22 industries as of September 2020. Due to time limitation and the diversified nature of businesses we are excluding samples from Banks, Financial Institutions, Bonds (Corporate & Treasury), Debenture, Insurance, and Mutual Funds for this study. The study is now based on the remaining 15 industries: Cement, Ceramics, Engineering, Food & Allied, Fuel & Power, IT Sector, Jute, Paper & Printing, Pharmaceuticals and Chemicals, Service & Real Estate, Tannery, Telecommunication, Textile, Travel & Leisure and lastly Miscellaneous. Based on the size of the industry, a sample of 5 to 10 firm-year are considered from each industry to accomplish the research. Precisely, the annual reports of these sectors in the sample were collected from the period 2015-2019 and a stable group of randomly selected companies has been developed for the study.

Table 1: Disclosing Firms by Industry

Sector	Cement	Ceramics	Engineering	Food & Allied	Fuel & power	Jute	Textile	Pharmaceutical	Paper & printing	Travel & Leisure	Service & Real-estate	IT Sector	Tannery	Telecommunication	Miscellaneous	Total
Number of firms	6	5	11	9	9	3	14	13	3	4	3	6	4	2	8	100
Firm-years	27	26	53	42	44	10	69	69	12	17	15	27	19	10	39	480

3.2 Data Collection Procedure

Secondary data has been used for conducting the analysis. Secondary data refers to those data that have been collected previously by someone for other research projects or any other purpose. The main source of the data for these sectors is published financial reports. These were obtained mainly from individual company websites. Besides, other sources, for example, the website of 'Lanka Bangla Financial Portal,' are also used for this study. Additionally, intellectual articles are taken from academic journals and different renowned websites are used to take depth knowledge of the content.

3.3 Models (Regression Equation)

The quantifiable research method has been engaged here to find out the outcomes. This approach is considered quite suitable here as numerical and secondary data is used for the research According to Leavy (2004), studies based on statistics are widely used to define any justification for the observed data. This must contain the procedure of examining the secondary data that has been gathered previously. However, the main purpose of statistics is to summarize the answer to the questions that were procured in the research while reviewing literature for developing countries like Bangladesh. Statistical significance for hypotheses testing was set at

5% for the lower level and the upper level is 10%. Also, for statistical analysis, both inferential and descriptive statistics have been used.

Capital structure, the dependent variable, is measured by both book leverage (*booklev*) and market leverage (*mktlev*). Firm size (*lnassets*), firm performance (*roa*), tangibility (*tangib*), growth opportunity (*mkt2book*), and listing age (*lnage*) are the independent variables. Variables are defined in Table 2. Models also use sector and year dummies to absorb sector and year effects. The model we used for the study is:

$$booklev \int (lnassets, roa, tang, mkt2book, lnage, sector\ dummy, sector\ year) \text{—Eq(i)}$$

$$mktlev \int \int (lnassets, roa, tang, mkt2book, lnage, sector\ dummy, sector\ year) \text{—Eq(ii)}$$

Table 2: Variable Definitions

Acronym	Variable	Measure
booklev	*capital structure*	ratio of total liability to total assets
mktlev	*capital structure*	ratio of total liability to (total liabilities + market capitalization)
lnassets	*firm Size*	natural log of total assets
roa	*Firm performance*	ratio of earnings before interests and taxes to total assets
tangib	*tangibility*	ratio of fixed assets to total assets
mkt2book	*growth opportunity*	ratio of market value of equity/ book value of equity
lnage	*listing age*	natural log of listing age

3.4 Descriptive Statistics

Variables nature summarization and description are done in descriptive statistics. It refers to the ways a huge number of observations are nicely condensed to interpretable figures, for

instance, percentages, and averages. Although, it's alongside a limitation too that descriptive statistics can only make summaries for any empirical study.

Descriptive statistics for the independent variables are shown in Table 3. *mktlev2* ranges from minimum -.2278493 to maximum .9984216 indicating the best probable outcome is only 99% of the maximum possible notch. The mean calculated here is .3512681 and the standard deviation is .252857. Again, the mean of *roa* is curved a bit with .0921186 along with a standard deviation of .4610947. This means firm performance affects capital structure decisions comparatively low than other variables. On average *tangibil* affect the leverage decision 41%, which is the highest also among others where the minimum is .0003697. This contrasts the *firm age* with a mean of 2.841566 where 1% is minimum.

Table 3: Descriptive Statistics

Variable	Obs.	Mean	Std. dev.	Min	Max
mktlev	443	.3512681	.252857	-.2278493	.9984216
booklev	451	2.514133	38.36699	-1.131579	808.5106
roa	442	.0921186	.4610947	-3.444059	8.510638
tangibil	473	.4143467	.4971236	.0003697	9.361702
lnage	480	2.841566	.7186066	0	3.78419
lnassets	476	21.97963	1.781109	15.02987	26.2286
mkt2book	463	3.955245	7.184908	-5.651972	68.78715

3.5 Correlation Matrix

This matrix has been used to show coefficients between variables. Correlation analysis falls under the inferential test which is employed to extract conclusions about the consistency of the outcomes.

To precise, the main aim of correlation is to identify the relationship between capital structure and its determinants. In this study, Capital Structure is the Dependent variable and. Capital structure is measured with the ratio of Total Liability / Total Asset. Independent or Explanatory variables are: Firm Size, Firm Performance, Growth Opportunity, Tangibility, and Listing Age

The correlation among the above-mentioned variables is presented in Table 4. This relationship is summarized by Pearson Correlation Matrix. Pearson Correlation calculates the soundness and direction of two variables having a linear relationship. Where values no matter what, range from -1 to +1. Minus one indicates string negative and plus indicates a strong positive relationship among variables. From the outcome of the below table, it is clear that *tangibility* and *booklev2* are highly correlated. On the other hand, *lnage* and *mktlev2* are less likely correlated. Among all the variables an *lnasset* and *mkltlev2* is the one which neither highly correlated nor less.

Table 4: Correlation Matrix

	mkt-cap	*mkt-lev*	*book-lev*	*lnasset*	*roa*	*tangibil*	*lnage*	*mkt2 book*
mktcap	1.0000							
mktlev	-0.1335	1.0000						
booklev	-0.0016	0.1186	1.0000					
lnasset	0.2358	0.3031	-0.1064	1.0000				
roa	0.0595	-0.0368	0.8175	0.0253	1.0000			
tangibil	0.0144	0.0667	0.8287	-0.0889	0.8056	1.0000		
lnage	0.0534	0.0032	0.0705	-0.1617	0.0423	0.0174	1.0000	
mkt2book	0.4872	-0.3498	-0.0192	-0.1208	0.0727	-0.0950	0.1754	1.0000

Chapter 4: Principle Results

4.1 R-squared and the Goodness-of-Fit

A good-fitting regression model provides very close predicted values to the observed values. If no informative predictor variables are present then we generally use the mean for every predicted value in the Mean model.

To evaluate model fitness three statistics are mostly used. They are Ordinary Least Squares (OLS) regression to assess the fitness of model: R-squared, the overall F-test, and the Root Mean Square Error (RMSE). However, here, I am using R-squared for linear regression models. This shows how closely the data are formfitting in the regression line. The relationship between independent and the dependent variable on a convenient 0 – 100% scale is measured by R-squared. Meaning of 0% is no variable from the response data is approximate to its mean whereas 100% shows that all the variables are very nearby to the mean.

We can also put it this way:

R-squared = Described variation / Total deviation

Graphical illustration of different R-squared values for regression model are as follows.
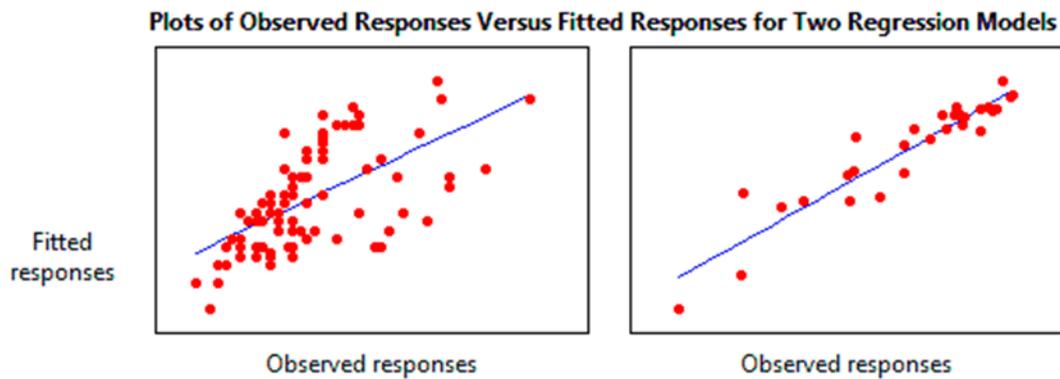

Plots of Observed Responses Versus Fitted Responses for Two Regression Models

Figure 1: R-squared graphical representation

Based on the regression analysis outcome from Table 5, for *Eq* (1) which is *Booklev*, R squared value is 0.775, and *Eq* (2) which is *Mktlev* 0.276. This means *Eq* (1) fits quite well with 77%. This means all the variables of the data is nearby of the mean. Whereas the R-square value for *Eq* (2) is relatively low.

The main shortcoming is it cannot determine value correctly if the coefficient estimations are biased. R-squared value can be high if the model is not capable to fit in the data. On the contrary, a low R-squared value for a very good model.

4.2 Interpretation of Regression Analysis

Regression analysis is one of the influential statistical approach that inspect the connection between two or more variables of concern. This helps empirical studies to establish the hypothesis by examining the influence of the independent variable on a dependent variable.

Table 5 explains how the capital structure decisions of Bangladeshi non-manufacturing firms are influenced by their firm specific characteristics for a sample period of 2015-2019.

VARIABLES	Eq 1 (Model 1) (booklev)	Eq 2 (Model 2) (mktlev)
Firm Size	-1.894*** (0.672)	0.0544*** (0.00757)
Firm Performance	33.98*** (3.708)	-0.174*** (0.0417)
Growth	-0.0137 (0.0322)	0.00116*** (0.000362)
Tangibility	38.89*** (3.435)	0.172*** (0.0387)
Listing Age	2.890* (1.592)	0.00803 (0.0179)
Constant	19.75 (16.45)	-0.897*** (0.185)
Year Dummy	Yes	Yes
Sector Dummy	Yes	Yes
Observations	412	412
R-squared	0.775	0.276

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Firm Size is an important variable for capital structure decisions. For this study, I measured firm size by the natural log of total assets. Research by Kurshev & Strebulaev (2015) shows firm size has been empirically found to be related both strongly positively with capital structure. Small firms tend to choose a large number of leverage when it's required to refinance in order to pay off the periodic rebalancing. Longer waiting periods among refinancing results in less leverage level at the end of every reorganizing stage. If the firm is big enough to finance its own cost then supposedly the firm will make more profit as there will be little or no liability. A number of studies have been done by different authors such as Varaiya, Kerin, and Weeks (1987), Liow (2010), Hermuningsih (2014), Kodongo, Mokoaleli-Mokoteli, and Maina (2015), (Mule, Mukras,& Nzioka, 2015), and Sucuahi and Cambarihan (2016), studying the effect of growth, size, and capital structure on enterprise value. The results of these studies have both similarities and differences with one another due to the use of different measurements.

Consistent with their views, my results show a negative relationship (coefficient -1.894, at 1% significance level) when I measure capital structure with *booklev* (ratio of total liability to total asset). However, the result is positive (coefficient 0.0544, at 1% significance level).when I measure this with *mkttlev* (ratio of total liability to total liability plus market capitalization). Evgeny (2017) found quite similar result in his research. According to his study, firm size is positively related with book leverage and market leverage. The outcome is more doubtfully relatable to trade off theory that says larger firms are more likely to face less risk in business. Thus their leverage proration is high. Then again it refutes pecking order and agency theory which says large firms retained earnings is much high that they don't need leverage to manage their expenses.

Firm Performance holds crucial importance on capital structure decisions. According to, Modigliani and Miller's (1958) research, a quite good number of studies showed association among the structure of capital and monetary performance. Further, Modigliani and Miller suggested in his study on the Turkish manufacturing sector, that a firm's value is not dependent on capital structure decisions in a proficient market and there should be no tax factor. Thereby it can be said that idea configuration of ideal capital cannot be stretched based on Modigliani and Miller's approaches. In my study again I found a mixed relationship. I used the ratio of earnings before interests and taxes to total assets for measuring firm performance. The relationship is found positive (coefficient 33.98 at 10% significance level) with *booklev* and negative (coefficient -0.174 at a 1% significance level) with *mktlev*. Thus, it also cannot clearly relatable with the most of the previous presumption.

Growth opportunity has been contemplated as a noteworthy element for a company. Awan, Bhati, Ali, Quershi (2010) shows a negative relationship among growth opportunity and leverage of firms on research from companies 9 different sectors from the Karachi Stock Exchange. However, there are a number of research alongside that show a positive relationship.

Importantly, in that research an important finding was industry type creates a very good impact among growth opportunities and leverage. He further added that firms having low and medium growth chances have importance for this positive relationship. Again, in my study, this variable shows negative (coefficient -0.0137, at 1% significance level) and positive (coefficient 0.00116, at 1% significance level) relation for *booklev* and *mktlev* respectively. Here, I used the ratio of the market value of equity to book value of equity to measure the growth opportunity in my selected industries. Again, Evgeny (2017)'s outcomes for growth is similar with this study to some extent. He equally found a negative relation with market leverage. The difference is hid other two leverage ratios outcome is also negative and as a result he claimed that his finding is correlated with trade off theory and agency theory.

Tangibility refers to those assets that can be measured physically in a company's operation. Theoretically, asset tangibility increases the capacity of borrowing to a firm since it permits lenders to reclaim the firm's assets as soon as possible (Campello & Giambona, 2012). Furthermore, they added that tangible assets are often illiquid. However, I found a positive relationship (coefficient 38.89 & 0.172 at 10% & 1% significance level respectively) among tangibility and capital structure in both *booklev* and *mktlev* model. This means tangibility affects profitability as well. In my study, I measured tangibility through a ratio of fixed assets to total assets. Hence it can be assumed that firms with more tangible assets have the flexibility to borrow more debt with lower cost

Listing Age is the last control variable for this study which is measured statistically through the natural log of listing age. Listing age is equally important in this leverage decision as to when the firm is old enough and the firm's age is much than it creates a positive impact to the creditors if the firm plans for debt financing. In my study, there is a positive relationship (coefficient 2.890 and 0.00803 at a 1% significance level respectively) among listing age and capital structure decisions in both models.

Table 6: Summary of Hypothesis Testing

No	Hypothesis	Results	
		eq1	eq2
H1	Firm Size is positively related with Capital Structure.	Negative	Positive
H2	Firm Performance is positively related with Capital Structure.	Positive	Negative
H3	Firm's Growth Opportunity is negatively related with Capital Structure.	Negative	Positive
H4	Firm's Tangibility is negatively related with Capital Structure.	Positive	Positive
H5	Firm's Listing Age is positively related with Capital Structure.	Positive	Positive

Chapter 5: Conclusion

The core purpose of this study is to categorize the determinants (Firm Size, Firm Performance, Growth Opportunity, Tangibility, and Listing Age) of capital structure for selected Bangladeshi firms that affect the firms' leverage decision. The study covered data from 100 listed firms over the period of 2015-2019 from the Dhaka Stock Exchange. This sample covers different sizes of firms from every industry in Bangladesh.

During the study, I have developed five different hypotheses. For analysis, I have used descriptive statistics, Pearson correlation, and regression analysis. I have used two different models for regression, which are based on book and market leverage: *booklev* and *mktlev* respectively.

The findings are quite interesting for firm size, performance, and growth opportunity. As for these three variables I got two opposite relationships from two models. For the remaining two which are tangibility and listing age, findings are consistent in both models.

One probable reason for these different findings can be the sample size. There is a total of 222 firms listed on the Dhaka Stock Exchange. Hence, selection bias can be a crucial reason for the difference. As I got less time to complete the study, I had to select firms randomly. It is a major shortcoming of my study. Instead, if I would select firms gently by reading company details than chances are high of getting different results.

However, based on my findings it can be said undoubtedly that tangibility and listing age of a firm are significantly related to capital structure decisions. According to all other prior research and mine, it can be concluded that firm size also plays a significant positive role and often negative as well. Though according to my findings on Bangladeshi firms it can be both positive and negative for firm performance and growth opportunity there are some discrepancies in

findings based on industries and developed or developing countries. All this has been discussed in detail in Chapter 2 of this study.

To conclude, I would like to state that this thesis report was a great opportunity to dive deep into different capital structure determinants from prior studies that affect Bangladeshi firms. Different types of determinants affect different countries. To some extent, it depends on the company structure that varies from country to country. I consider myself lucky that with the help of my supervisor I got the opportunity to study on such a thoughtful topic and came up with findings. Ending this report on the note that, hopefully, my findings would add little value if this topic rises further for more deep study in Bangladesh or any developing country like us.

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