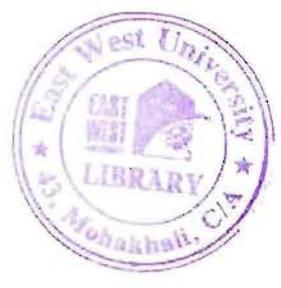


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An Overview of Capital Structure of Engineering Industry of Bangladesh



Project Report

On

An Overview of Capital Structure of Engineering Industry of Bangladesh

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2008-1-10-076

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EAST WEST UNIVERSITY



LETTER OF TRANSMITTAL

18th December, 2011

Dr. Tanbir Ahmed Chowdhury Professor Department of Business Administration East West University

Subject: Letter regarding submission of project work on “An Overview of Capital Structure of Engineering Industry of Bangladesh”.

Dear Sir, It's a great pleasure for me to have the opportunity to submit my project work on “An Overview of Capital Structure of Engineering Industry of Bangladesh” which had been a great experience for me to work in such an important area. I tried utmost to make & let it look like a professional one. Any shortcomings are expected to have a kind view for our encouragement.

Thank you for your sincere & honest try to let me make easy & get familiar with different terms & ratios of the capital structure as well as its importance to measure financial performance to help me make the paper a successful one.

My efforts will be valued if this report can serve for what it's been meant for & my assistance will be there for any queries.

Sincerely yours,

Salman Shahriar 2008-1-10-076 Business Administration Department East West University

Executive Summary

Analysis of capital structure gives an overall scenario of the company's strength and capacity to acquire capital for running as well as growing its business. Equity and Debt are two chief financing sources of a company. Equity can be in the form of common stock and preferred stock; and debt, primarily in the form of bonds and notes and then it can be in the form of loans and advances from financial institutions. As both these two genres have unique sets of risk and return, choice of the financing source is always a critical parameter for the financial managers of any company. This report particularly focuses on the capital structure preferences of the companies in the engineering industry of Bangladesh and also to test the influence of various independent factors in the capital structure and the conformity of these factors with the predictions drawn by capital structure theories. With this objective, the cost of debt and equity of the selected companies have been analyzed, various leverages as well as ratios were calculated and finally, the influence of different influencing independent factors on capital structure has been tested.

The analyses and calculations of this report entirely depend on secondary data collected from the annual reports of the selected companies and Dhaka Stock Exchange (DSE). The capital structures were determined by calculating the debt and equity portions of total value of the firm and then the costs of these two financing sources were computed separately the summation of which resulted in the total costs of capital. The use of Degree of Operating Leverage (DOL), Degree of Financial Leverage (DFL) and Degree of Total Leverage (DTL) resulted in the calculation of the riskiness and also in the profit potential of the entire firm. Finally, the influence of the independent factors like operating leverage, growth rate, tangibility, debt service capacity on capital structure was tested and a conclusion drawn on the influence of the factors and checked those with the popular theories.

Acknowledgement

First of all I acknowledge my gratitude to the Almighty Allah.

My deepest gratitude to my project supervisor Dr. Tanbir Ahmed Chowdhury, Professor, Faculty of Department of Business Administration, East West University for giving me this type of project and helping to complete the report. I do believe this study have enriched my knowledge and will be very much helpful for my near future.



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Chapter - 1

Introduction

Bangladesh is a developing country with potential for rapid economic development. Like all other developing nations it has an ample scope for industrial development, which would eventually bring about positive outcome for the country's economy. Towards ensuring a healthy growth the country needs development of adequate infrastructure facilities and development of infrastructural facilities is not possible without development of industries.

Analyzing the capital structure of an engineering company of Bangladesh will give the overall situation of the sector. A company's proportion of long-term debt and equity is considered when analyzing capital structure. When people refer to capital structure they are most likely referring to a firm's debt-to-equity ratio, which provides insight into how risky a company is. Usually a company is more heavily financed by debt poses greater risk, as this firm is relatively highly levered. The capital structure is how a firm finances its overall operations and growth by using different sources of funds. Debt comes in the form of bond issues or long-term notes payable, while equity is classified as common stock, preferred stock or retained earnings.

1.1 Origin of the Report

This report has been prepared to make a study on "An overview of Capital Structure of Engineering Industry of Bangladesh." as a part of the fulfillment of the Project required for the completion of Bachelor of Business Administration program of East West University.

The report was prepared under the supervision of Dr. Tanbir Ahmed Chowdhury Professor, East West University.

I am very much thankful to him for assigning me such types of project work.

1.2 Objective of the Study

The overall objective of this report is to analyze the capital structure of five publicly traded engineering industries of Bangladesh. The specific objectives of the study are listed below:

- To understand the concept of capital structure.
- To analyze the prevailing capital structure in the engineering industry of Bangladesh.
- To test the influence of different influencing independent factors like operating leverage, financial leverage, asset growth rate and tangibility ratio.
- To test the effect of change in capital structure of cost of capital and market price of share.

1.3 Scope of the Report

In Bangladesh, presently there are 25 engineering companies enlisted with Dhaka Stock Exchange. This report considers last 5(five) years financial statements of 6 (six) selected engineering companies to analyze and evaluate the capital structure of engineering industry.

1.4 Methodology

There are Twenty five (25) engineering company enlisted with Dhaka Stock Exchange. I randomly choose ¼th or 25% or six (6) companies from all engineering companies to conduct the study. To identify the capital structure of specified companies, this report required information auditors' report from different annual reports, yearend stock price. Latest five year's information was collected for randomly chosen six (6) companies. Selected companies are:

- ❖ Singer Bangladesh Limited
- ❖ Aftab Automobile Limited
- ❖ Atlas Bangladesh Limited
- ❖ Bangladesh Thai Aluminium Limited
- ❖ Monno Jute Stafflers Limited
- ❖ Eastern Cables Limited

For execution of the report I used MS office and MS Excel software and SPSS. Topic of the report did not permit me to input data from primary sources. As the report must be factual, the data source of this report is basically secondary sources. I gathered relevant data from the different periodicals published by the sector. I also collected relevant information from different books as well. I collected some data from the internet to broaden scope of analysis. All information used in this study was from secondary data sources. So, no primary data is included in this report.

1.5 Limitation

- Size of the companies in engineering industries is different. As a result, they were not completely comparable.
- Theories of books were for efficient market. These theories were not completely applicable for an inefficient market like Bangladesh.
- All data are secondary data.



Chapter 2

Theoretical and Literature Review

2.1 *Introduction*

Capital structure refers to the way a corporation finances its assets through some combination of equity, debt, or hybrid securities. The history of modern theory of capital structure started with the path-breaking paper of Modigliani and Miller published in 1958. In this paper, they used some restrictive set of assumptions and contended in their first proposition that the impact of financing on the value of the firm is irrelevant. The Miller and Modigliani (M&M) propositions assert that there would be arbitrage opportunities in the perfect capital market if the value of the firm depends on its capital structure. They also argue that if investors and firms can borrow at the same rate, investors can neutralize any capital structure decisions the firm's management may take. Though their proposition theoretically sounds good but it is only valid under perfect market conditions (no tax is one of them) which were not actually possible in real world. After that a lot of study was carried out to explain different issues related to capital structure. Some of the popular theories are discussed in the following section.

2.2 *Theories, Approaches and Principles of Capital Structure*

The Modigliani-Miller (M&M) Theory

The Modigliani-Miller theory, (also known as The Total-Value Principle) proposed by Franco Modigliani and Merton Miller, forms the basis for modern thinking on capital structure, though it is generally viewed as a purely theoretical result since it assumes away many important factors in the capital structure decision. The theory states that, in a perfect market, how a firm is financed is irrelevant to its value. This result provides the base with which to examine real world reasons why capital structure is relevant,

that is, a company's value is affected by the capital structure it employs. These other reasons include bankruptcy costs, agency costs, taxes, information asymmetry, to name some. This analysis can then be extended to look at whether there is in fact an optimal capital structure: the one which maximizes the value of the firm (Baker & Wurgler, 2002)

In their original position, Modigliani-Miller theory advocates that the relationship between financial leverage and the cost of capital is explained by Net Operating Income approach. They make a formidable attack on the traditional position by offering behavioral justification for having the overall capitalization rate, k_0 , remain constant throughout the entire range of financial leverage probabilities. This is because the total investment value of a corporation depends on its underlying profitability and risk, firm value unchanging with aspect of changes in the firm's capital structure. Thus, in the absence of taxes and market imperfections, the value of the firm's total value does not change no matter how the capital structure is divided into debt, equity and other securities. The support for this position rests on the idea that the investors are able to substitute personal for corporate financial leverage. Thus, investors have the capacity to replicate any capital structure, through personal-borrowing, the firm might undertake (Horne & Wachowicz, 2005).

Trade-off theory allows the bankruptcy cost to exist. It states that there is an advantage to financing with debt (namely, the tax benefit of debts) and that there is a cost of financing with debt (the bankruptcy costs of debt). The marginal benefit of further increases in debt declines as debt increases, while the marginal cost increases, so that a firm that is optimizing its overall value will focus on this trade-off when choosing how much debt and equity to use for financing. Empirically, this theory may explain differences in D/E ratios between industries, but it doesn't explain differences within the same industry (Lyandres, 2010).

Now, if capital structure is irrelevant in a perfect market, then imperfections which exist in the real world must be the cause of its relevance. The theories below try to address some of these imperfections, by relaxing assumptions made in the M&M model.

Net Operating Income (NOI) Approach

Net Operating Income (NOI) approach to capital structure is a theory of in which the weighted average cost of capital (WACC) and the total value of the firm remain constant as the financial leverage is changed. With this approach, net operating income is capitalized (discounted) at the firm's overall capitalization rate to obtain the total market value of the firm. The market value of the debt is then deducted from the total market value to obtain the market value of the common stock. The critical assumption with this approach is that the overall capitalization rate, k_o , as well as the cost of debt funds, k_i , stays the same regardless of the financial leverage employed. As a firm increases its use of financial leverage, it becomes increasingly riskier. Besides as long as k_i remains constant, k_e , the required rate of return on equity, is a constant linear function of the debt-to-equity ratio (measured in market value terms). Because the cost of capital of the firm, k_o , cannot be altered through financial leverage, the Net Operating Income (NOI) approach implies that there is no one optimal capital structure (Horne & Wachowicz, 2005).

Traditional Approach

Traditional Approach to capital structure assumes that there exists an optimal capital structure and where management can increase the total value of the firm through the judicious use of financial leverage. This approach suggests that the firm can initially lower its cost of capital and raise its total value through increasing leverage. Although investors raise the required rate of return on equity, the increase in k_e does not entirely offset the benefit of using "cheaper" debt funds and as a result the weighted average cost of capital, k_o , declines with moderate use of financial leverage. After a point, the increase in k_e more than offsets the use of cheaper debt funds in the capital structure and k_o begins to rise. The rise in k_o is supported further as k_i begins to rise. And the optimal capital structure is the point at which k_o bottoms out (Horne & Wachowicz, 2005).

Pecking Order Theory

Pecking Order theory tries to capture the costs of asymmetric information. It states that companies prioritize their sources of financing (from internal financing to equity) according to the law of least effort, or of least resistance, preferring to raise equity as a financing means "of last resort". Hence: internal debt is used first; when that is depleted, then debt is issued; and when it is no longer sensible to issue any more debt, equity is issued. This theory maintains that businesses adhere to a hierarchy of financing sources and prefer internal financing when available, and debt is preferred over equity if external financing is required (equity would mean issuing shares which meant 'bringing external ownership' into the company). Thus, the form of debt a firm chooses can act as a signal of its need for external finance. The pecking order theory is popularized by Myers (1984) when he argues that equity is a less preferred means to raise capital because when managers (who are assumed to know better about true condition of the firm than investors) issue new equity, investors believe that managers think that the firm is overvalued and managers are taking advantage of this overvaluation. As a result, investors will place a lower value to the new equity issuance (Brealey & Myers, 2010).

Summing up the Theories

Modigliani Miller's provocative irrelevance proposition has resulted in considerable amount of work on the theory of capital structure. Myers (1984) proposed the "Static Trade Off Theory" of capital structure. According to this theory, a firm's optimal debt ratio is viewed as determined by a trade off the costs and benefits of borrowing, holding the firm's assets and investment plans constant. The various costs considered in the literature are bankruptcy costs (e.g. Scott, 1977), agency costs (Jensen and Meckling, 1977) and loss of non-debt tax shield (De Angelo and Masulis, 1980). These costs become especially relevant in situations of financial distress and have often been subsumed under "Cost of financial distress". As against these costs the major benefit of debt financing is the tax shield of interest expenses. The two important empirical implications developed out of the static trade off theory are: i) The Companies which

are having larger proportion of tangible assets and more growth opportunities are likely to have more debt-ratio. The costs of distress are likely to be higher for firms whose value depends on growth opportunities and intangible assets. Sometimes firms are likely to forego investment opportunity due to financial distress. Moreover, if a default occurs, the loss due to liquidation value of their assets is likely to be more. ii) Companies like pharmaceutical and information technology have high business risk and less debt. Because, they would be less certain of generating enough income to utilise their debt tax shields. One important empirical observation inconsistent with the Static Trade Off Theory is that most profitable firms tend to borrow the least. Myers (1984) explains the negative relationship between profitability and the debt equity ratio using what he calls the 'Pecking Order Theory'. This is based on the assumption that the firms have a preference for internal finance. If internal finance is not sufficient, then they first issue debt, followed by hybrid securities such as Partly Convertible Bonds, Fully Convertible Bond and Equity as a last resort. Managers may prefer internal financing because it relieves them from the disciplining effects of the Security Market. Moreover, as shown by Myers and Majluf (1984) an issue of equity also requires Managers to deal with a possible conflict of interest - between existing and new shareholders. Finally if one accepts the pecking order theory then more profitable firms would end up with lower debt ratios, because they would be able to finance their investments through the preferred internal sources and do not have to resort to debt financing. The pecking order theory also implies that companies with high rates should have a higher debt ratio since the need for external funds would be higher (G., 2008)

Gorden (1962) found that as gearing increased with size, return on investment was negatively related to debt ratio. He also confirmed the negative association between operating risk and debt ratio.

Baxter (1967) reported that leverage would depend on the variance of net operating earnings. Since business with relatively stable income streams are less subject to the possibility of ruin, they may find it desirable to rely relatively heavily on debt financing. On the other hand, firms with risky income streams are less able to assume fixed charge sources of finance. Hence he concluded negative association between variance of net operating earnings and leverage.



Gupta (1969) conducted a study on the financial structure of American Manufacturing Enterprises. The focus of the study was analyzing the industry effect and the growth effect on the financial structural relationship of American Manufacturing Enterprises. It was a cross sectional study for the year 1961-62. The study confirmed that total debt ratios were positively related to growth and negatively related to size. He also found significant industry effect on debt ratio. He further observed that "family pattern of ownership" is an important determinant of leverage in the paper and allied product industry.

Toy et al (1974) reported that higher the operating risk companies showed, higher is the debt ratio. They found that debt ratios were positively related to growth typically measured as sales growth and return on investment was negatively related to debt ratio. They also concluded that the corporation size and the industry class do not appear to be determinants of debt ratio.

Carelton and Siberman (1997) concluded that higher the variability in rate of return on invested capital, lower will be the degree of financial leverage adopted. Hence it is the variance, not the rate of return that is the ultimate determinant of leverage. They also found return on investment to be negatively related to debt ratio.

Ferri and Jones (1979) examined the determinants of financial structure. The objective of their study was to investigate the relationship between a firm's financial structure and its industrial class, size, variability of income and operating leverage. They found that the industry class was linked to the firm's leverage, but not in a direct manner as was suggested in other researches. Secondly, a firm's use of debt is related to its size, but the income could not be shown to be associated with the firm's leverage. Finally, operating leverage does influence the percentage of debt in a firm's financial structure and the relationship between these two types of leverage is similar to the negative linear form which financial theory suggests.

Bhat (1980) studied the impact of size, growth, business risk, dividend policy, profitability, debt service capacity and the degree of operating leverages on the leverage ratio of the firm. He used multiple regression models to find out the contribution of each characteristic. Business risk (defined as earning instability), profitability, dividend

payout and debt service capacity were found to be significant determinants of the leverage ratio. He used a sample of 63 companies from engineering industry.

Venkatesan (1983) investigated the determinants of financial leverage by analyzing the relationship between seven different variables and the financial structure of the firms. The variables included industry categorization, size, operating leverage, debt coverage, cash flow coverage, business risk, and growth ratio. Industry influence has been examined on the grouping of firms in various leverages classes and he found a statistical relationship between industry class and leverage, but the relationship could not be significant and conclusive. The impact of the remaining independent variables on the dependent variable was examined in two sample classifications, viz. Intra-industry and Inter-industry through multiple regression analysis. In summation, only debt coverage ratio was found to be the important variable significantly affecting the financial structure of the firm.

Mathew (1997) has made an attempt to analyze the relationship between ownership structure and financial structure with a view to know whether the former has any impact on the latter. The analysis was based on three hypothetical relationships that exist between ownership structures on one hand and unsystematic risk, non-manufacturing expenses and profit appropriation policies on the other hand. He concluded that wherever the management stake is high, leverage will be low and vice versa and there exists a significant relationship between ownership structure and financial structure of firms.

Ram Kumar Kakani (1999) in his paper entitled "Determinants of Capital Structure" attempted to find out the determinants of the capital structure and its maturity in India and he has analyzed measure of short-term and long-term debt rather than an aggregate measure of total debt. And he also analyzed the empirical implications of liberalizations of the Indian Economy 'on the determinants of capital structure of the firms'.

Kotrappa (2000) slacked that the success of a corporation greatly depends upon sound financing. When the original financing has been sound, a co-operation has less fear for the future, provided it is given by a competent management. In this write-up, he

attempts to sketch the factories responsible for reduced proportion of debt capital in the total capital employed. However, the choice between debt and equity sources of capital for a corporate borrower is greatly influenced by these factors. 1) Taxes on Corporate Incomes 2) Inflation 3) Controlling Interest 4) Capital Market Reforms.

Bradley, Jarroll and Kim (2002) found that debt to asset ratio is negatively related to both the volatility of annual operating earnings and advertising and Research and Development expenses.

Mohanty (2003) found that leverage is negatively related with profitability and value of the firm both within an industry as well as within the Indian Economy. It has been found that companies that spend a large sum of money on advertisement and Research and Development expenditure are the least levered.

2.3 *Literature Review*

The history of modern theory of capital structure started with the path-breaking paper of Modigliani and Miller published in 1958. In this paper, they used some restrictive set of assumptions and contended in their first proposition that the impact of financing on the value of the firm is irrelevant. The Miller and Modigliani (M&M) propositions assert that there would be arbitrage opportunities in the perfect capital market if the value of the firm depends on its capital structure. They also argue that if investors and firms can borrow at the same rate, investors can neutralize any capital structure decisions the firm's management may take (home-made leverage). Though their proposition theoretically sounds good but it is only valid under perfect market conditions (no tax is one of them) which were not actually possible in real world. They corrected this proposition in 1963 incorporating the effect of tax on value and cost of the capital of the firm (Modigliani and Miller 1963). Their new proposition contends that, in the world of corporate tax, the value of the firm depends on the variation of the debt level and tax shield benefit on interest payments. In 1976, Miller brought forward the next version of

irrelevance theory of capital structure. He appealed that, capital structure decisions of firms with both corporate and personal taxes circumstances are irrelevant (Miller 1977).

Then there develops static tradeoff model. According to this model, optimal capital structure does exist. A firm sets its target debt level and then gradually moves towards it. This theory asserts that a firm's optimal debt-equity ratio is achieved at the point when the marginal present value of the tax on additional debt is equal to the increase in the present value of financial distress costs. Under this theory, a firm's target leverage is driven by three competing forces: (i) taxes, (ii) costs of financial distress (bankruptcy costs), and (iii) agency costs. Both tax-based and agency-cost-based models belong to the static tradeoff models as supported by Kraus and Litzenberger (1973), Jensen and Meckling (1976), Miller (1977), Kim (1978), Bradley, Grossman and Hart (1982), Jarrel and Kim (1984), Jensen (1986), Harris and Raviv (1990), Stulz (1990) and Chang (1999).

Agency theory developed by Jensen and Meckling in 1976 also suggest for an optimal debt level in capital structure by minimizing the agency costs arising from the divergent interest of managers with shareholders and debt holders. Jensen and Meckling (1976) suggest that either ownership of the managers in the firm should be increased in order to align the interest of managers with that of the owners or use of debt should be motivated to control managers' tendency for excessive perk consumptions. Jensen (1986) presents agency problem associated with free-cash flow. He suggests that free cash flow problem can be somehow controlled by increasing the stake of managers in the business or by increasing debt in the capital structure, thereby reducing the amount of "free" cash available to managers.

There are several capital structure theories like signaling theory and pecking order theory those apply notion of asymmetric information with an attempt to explain the role asymmetric information plays in determining the optimal capital structure. Ross

(1977) laid down the foundations of signaling theory and its various extensions. He assumes that managers being the insiders have a better knowledge about the true distribution of future returns of the firm whereas investors do not.

According to Ross, investors interpret larger levels of leverage as a signal of the firm's current stable income, high future cash flows and managers' confidence about the performance of their own firm. Accordingly, Ross (1977) concludes that investors take larger levels of debt as a signal of higher quality and that profitability (as a proxy of quality performance) and leverage are thus positively related.

On the other hand, pecking order theory, suggested by Myers and Majluf in 1984, who captured the effect of asymmetric information upon the mispricing of new securities, says that there is no well defined target debt ratio. They say that investors generally perceive that managers are better informed of the price sensitive information of the firms. Investors' perception is such that managers issue risky securities when they are overpriced. This perception of investors leads to the under pricing of new equity issue. Sometimes this under pricing becomes so severe that it causes substantial loss to the existing shareholders. To avoid the problem arising from information asymmetry firms fulfill their financing needs by preferring retained earnings as their main source of financing, then debt and finally external equity financing as a last resort. Capital structure is thus arranged by a hierarchy of preferences for the issuance of new capital. This has been termed as "Pecking Order Theory". While studying determinants of capital structure in the context of Bangladesh I have come across the most initial studies examined in the international level. In a cross sectional analysis Rajan and Zingales (1995) find that "the determinants of capital structure that have been reported for the U.S. (size, growth, profitability, and tangible assets) are important in other countries as well". The analysis by Booth et al (2001) suggests that the developing countries face more or less same factors in determining capital structure. Recent work by Kremp et al. (1999),

De Miguel and Pindado (2001), and Ozkan (2001) also focus on the issue of capital structure decisions, offering better insight on the determinants explaining the target debt-to-equity ratio. A very recent study by Drobetz and Fix (2003) tested leverage predictions of the trade-off and pecking order models using Swiss data. Confirming the pecking order model but contradicting the trade-off model, they say that “more profitable firms use less leverage. Firms with more investment opportunities apply less leverage, which supports both the trade off model and a complex version of the pecking order model. Leverage is also closely related to tangibility of assets and the volatility of a firm’s earnings”. Recent study carried out by Gaud, Jani, Hoesli, André and Bender (2003) on Swiss companies uses growth opportunity, size, profitability, tangibility, operating risk as determinants of capital structure. Size, tangibility and risk variables have a positive impact on leverage whereas growth opportunity and profitability shows a negative relation. Baral (2004) uses growth rate, size, business risk, dividend payout ratio, operating leverage, profitability and debt service capacity in his study on listed companies of Nepal. The first five variables show a positive relation with leverage whereas the last two proves to have negative relation. Huang and Song (2002) in their analysis on Chinese company, includes growth rate, size, profitability, tangibility, non-debt tax shield, tax, ownership structure, volatility as determinants of capital structure. Their study shows that profitability and non-debt tax shield is strongly negatively related with leverage. Volatility, size and ownership of institutes are positively related whereas tax and management shareholding, as per their expectation, have no significant effect on leverage. A very recent study by Shah and Khan in 2007 includes growth opportunity, size, and profitability, tangibility, earning volatility and non-debt tax shield as important determinants of capital structure. Their study reveals that tangibility and size are positively related, where profitability and growth opportunity are negatively related. Non-debt tax shield and earning volatility appear to have no significant impact on leverage.

At national level, Haque (1989) empirically tested the Bangladeshi firms and finds that capital structure do significantly vary among industries and it has no significant impact on firm's profitability, dividend and market value. Chowdhury (2004), based on Bangladeshi and Japanese panel data, did another study on capital structure determinants with agency variables and finds agency-debt, bankruptcy risk, growth rate, profitability and operating leverage to significantly affect capital structure choice.

Chapter 3

An Overview of Engineering Industry

3.1 Industry Profile:

The major markets for engineering services are mostly domestic and sector oriented. However, most European consulting engineering firms prefer to use local partners, rather than partners from other developing countries. It should also be noted that because of the booming house building market in Bangladesh, there is a large demand for pipes cables and steels, a number of new cables and pipes plants have been built and more are expected. Pipe, cable and steel plant development is a specialized business usually managed by a number of specialized contractors. It should also be noted that because of development of road and transport system, there is a large demand for automobile. There is also an increasing demand for electronics home appliances.

Currently, the main trade flows in the engineering sector are mostly one way with the majority of engineering services being imported from abroad. Most capital inflows are in the form of supplier's credits and debt financing as the international oil companies make capital expenditures on gas production, while the international energy companies develop electricity generating capacity.

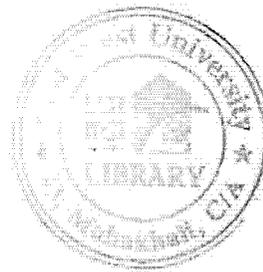
The engineering industry covers a broad range of sub-sectors, with potential major prospects coming from backward linkages of the other industry, if these programs are finally realized. Business prospects for engineering industry have been found in a number of the Balancing, Modernization, Relocation and Expansion (BMRE) program that have been authorized by the Bangladesh Government in order to upgrade the manufacturing capacity of the country. Owing to the problems of pollution associated with the leather and metal working industries, a number of BMRE projects have been found justified, with financial assistance being made available through national banks

and the Asian Development Bank under the BMRE scheme of the government. The Bangladesh Government also hopes to privatize a number of public sector manufacturing industries, which could attract foreign investment and allow them to be modernized or relocated. However, no European company contacted appeared to be interested in any public sector manufacturing company in any industry sector, since all of the public sector firms owe very large sums of money to the public sector banks, which would have to be repaid. Other modernization programs were found in the metal working business, where the Pran Group of companies were found to have gone to the Dhaka stock market to raise Taka 20 million to expand the capacity of the Rangpur Foundry Limited to produce tube wells, rice mill spares, pumps and agricultural pipe fittings, using imported equipment, mostly from India. The same company had originally been set up in 1989 to manufacture pumps, tube wells, plastic pipes and engine spares. Also in the building materials sector, there appeared to be some interest in attracting European machinery suppliers to relocate equipment to Bangladesh to set up the manufacturing of hollow concrete blocks, roof tiles and floor tiles.

3.2 Name of the Engineering Company Enlisted in Dhaka Stock Exchange

- Aftab Automobiles Limited
- Anwar Galvanizing Limited
- Atlas Bangladesh Limited
- Aziz Pipes Limited
- Bangladesh Autocars Limited
- Bangladesh Lamps Limited
- Bangladesh Thai Aluminium Limited
- BSRM Steels Limited

- Deshbandhu Polymer Limited
- Eastern Cables Limited
- Golden Son Limited
- Kay and Que Limited
- Monno Jutex Limited
- Monno Jute Stafflers Limited
- Navana CNG Limited
- National Polymer Limited
- National Tubes Limited
- Olympic Industries Limited
- Quasem Drycells Limited
- Rangpur Foundry Limited
- Renwick Jaineswar & Company Limited
- S. Alam Cold Rolled Steels Limited
- Singer Bangladesh Limited



Among the 25 companies I have selected 25% companies from the engineering industry.

The selected companies are:

1. Singer Bangladesh Limited
2. Aftab Automobiles Limited
3. Atlas Bangladesh Limited
4. Eastern Cables Limited
5. Monno Jute Stafflers Limited

6. Bangladesh Thai Aluminium Limited

3.3 Singer Bangladesh Limited

Singer Bangladesh Limited engages in manufacturing and marketing color television, motor cycles, and domestic and electric power cables in Bangladesh. The company also involves in marketing DVD players, home theatre systems, kitchen appliances, computers, motorcycle, sewing machines, instant power supply, refrigerators, freezers, air-conditioners, fan, generator, microwave oven, electric oven, washing machine, and sewing machines, as well as other consumer electronics and household appliances. It markets products under various brands, including Singer, Samsung, Whirlpool, Haier, Hayes, Moulinex, Sebec, Tefal, and Prestige through the dealer channel, as well as through its own retail chain shops under the name SINGER PLUS. The company was incorporated in 1979 and is based in Dhaka, Bangladesh. Singer Bangladesh Limited is a subsidiary of The Singer Bhold B.V.

3.4 Aftab Automobiles Limited

Aftab Automobiles Limited was incorporated in Bangladesh in 1967 as a Private Limited Company. In 1981 the Company registered itself as a Public Limited Company which is one of the largest automobile assembling plants in the private sector. The Registered Office of the Company is located at 125/A, Motijheel Commercial Area, Dhaka-1000. The Company was listed with Dhaka Stock Exchange Limited and Chittagong Stock Exchange Limited in the year 1987 and 1996 respectively. The principal activities of the Company throughout the period were assembling of Toyota Land Cruiser soft top/ Pick-up, Land Cruiser Prado, Hino Bus, Hino Mini Bus / Truck Chassis with a production Capacity of 2400 units of vehicles in 3 shifts in Assembling Unit. But since inception, the Plant is running single shift considering the market demand. The Company has added four units namely Body Building Unit, Paint Unit,

Battery Unit & Furniture Unit and the commercial production of which started w.e.f. May 5, 1997, November 01, 1999, January 03, 2002 and May 01, 2002 respectively.

3.5 Atlas Bangladesh Limited

Atlas Bangladesh Ltd. imports and distributes motorcycles and parts. The company was founded in 1966 and is based in Gazipur, Bangladesh. Atlas Bangladesh Ltd. is a subsidiary of Bangladesh Steel & Engineering Corporation.

3.6 Eastern Cables Limited

Eastern Cables, Ltd. manufactures cables and conductors in Bangladesh. Its products include PVC insulated and PVC sheathed single core and multicore low tension domestic cable; and control, flexible, and power cables with copper conductor. The company also produces armored and screened cables. In addition, it manufactures bare and insulated all aluminium conductor and aluminium conductor steel reinforced. Eastern Cables Ltd. with its office and factory at Patenga, Chittagong was established in 1967 and started its commercial production on 1st March 1971 for manufacturing of cables and conductors. Eastern Cables Limited, a subsidiary Company of Bangladesh Steel & Engineering Corporation (BSEC) is the biggest cables and conductor manufacturer in Bangladesh. The range of its products not only includes PVC insulated and PVC sheathed single core and multi core low tension domestic cable but also control, flexible and power cables with copper conductor having continuous permissible voltage grade up to 12 KV. It also enjoys the honor of being the pioneer in this country in the production of armored and screened cables. The different sizes of bare and insulated All Aluminium Conductor (AAC) and Aluminium Conductor Steel Reinforced (ACSR) are also being manufactured here.

3.7 Monno Jute Stafflers Limited

Monno Jute Stafflers Limited enlisted with Dhaka Stock Exchange in 1982. Authorized capital of Monno Jute Stafflers Limited is taka10 million.

3.8 Bangladesh Thai Aluminium

Bangladesh Thai Aluminium Limited (BTA) designs and manufactures anodized and powder coated aluminum products. It offers aluminum doors, windows, curtain walls, railway coach windows, ladders, bolts, and accessories. The company provides aluminum fabrication, extrusion, coating, and wrapping services. BTA was founded in 1979 and is based in Dhaka, Bangladesh.

Chapter - 4

Methodology of the Study

The methodology provides an understanding of how the study was conducted and organized in order to obtain, analyze and present the information. This study follows uncomplicated procedures which are discussed below:

4.1 Data Requirement

To identify the capital structure of specified companies, this report required information auditors' report from different annual reports, yearend stock price. Latest five year's information was collected for 6 selected companies. Selected companies are:

- ❖ Singer Bangladesh Limited
- ❖ Aftab Automobile Limited
- ❖ Atlas Bangladesh Limited
- ❖ Bangladesh Thai Aluminium Limited
- ❖ Monno Jute Stafflers Limited
- ❖ Eastern Cables Limited

4.2 Data Sources

- Annual Reports of the companies: Earnings before interest and taxes, EPS, Interest, Total asset, Total long term debt, Total equity and Fixed cost
- www.bdstockprice.com: Year-end stock price
- www.dsebd.org
- Dhaka Stock Exchange (Other Data)

Most of the annual reports were collected from Dhaka stock exchange library. Some recent annual reports were collected from specific company websites. Stock price data for different companies are depends on their face value.

4.3 Data Type

All information used in this study was from secondary data sources. So, no primary data is included in this report.

4.4 Statement of Hypotheses

This study has tested the following null hypotheses on relation between the independent variables and capital structure of the selected companies:

H_{01} : There is no significant relationship between the asset growth rate and debt ratio.

H_{02} : There is no significant relationship between the operating leverage and debt ratio.

H_{03} : There is no significant relationship between the financial leverage and debt ratio.

H_{04} : There is no significant relationship between the tangibility asset ratio and debt ratio.

The study has also tested the following hypotheses:

H_{05} : There is no significant relationship between the debt ratio and cost of capital

H_{06} : There is no significant relationship between the debt ratio and market price of share

4.5 Position of Capital Structure

The analysis of capital structure has been made by using following ratios:

i) Debt Equity Ratio

This ratio is calculated as:
$$\frac{\text{Total Debt}}{\text{Total Equity}}$$

ii) Debt to Total Asset Ratio

This ratio is calculated as:
$$\frac{\text{Total Debt}}{\text{Total Asset}}$$

ii) Long-term Debt Ratio

This ratio is calculated as:
$$\frac{\text{Long Term Debt}}{\text{Total Asset}}$$

The capital structure of each company has been determined using the above ratios. The parameters of the above six companies have been used to determine the industry average. The capital structures of the companies are then compared with the industry average.



Chapter - 5

Analysis and Results

5.1.1 Analysis of Capital Structures of Engineering Industry of 2006

In the following table shows the overall position of assets and capital structure , Debt-Equity Ratio, Debt to Total Asset, and Long-Term Debt Ratio of the selected engineering industries as at the end of the year 2006 and also the average of all these of the selected six companies, which is used for analyzing the position of individual companies:

Table 5-1: Overall Capital Structure of Selected engineering Companies of 2006

[Figure in million Taka]

	Singer Bangladesh Limited	Aftab Automobile Limited	Atlas Bangladesh Limited	Bangladesh Thai Aluminium	Monno Jute Stafflers Limited	Eastern Cables Limited	Industry Average
Debt- Asset Ratio	0.295	0.21	0.17	6.48	0.33	0.42	1.76
Debt- Equity Ratio	0.197	0.08	0.10	0.80	0.16	0.24	0.56
Long- term Debt Ratio	0.12	0.01	0.01	0.083	0.041	0.094	0.06

5.1.2 Analysis of Capital Structures of Engineering Industry of 2007

In the following table shows the overall position of assets and capital structure , Debt-Equity Ratio, Debt to Total Asset, and Long-Term Debt Ratio of the selected engineering industries as at the end of the year 2007 and also the average of all these of the selected six companies, which is used for analyzing the position of individual companies:

Table 5-2: Overall Capital Structure of Selected engineering Companies of 2007

[Figure in million Taka]

	Singer Bangladesh Limited	Aftab Automobile Limited	Atlas Bangladesh Limited	Bangladesh Thai Aluminium	Monno Jute Stafflers Limited	Eastern Cables Limited	Industry Average
Debt-Asset Ratio	0.327	0.25	0.21	9.96	0.25	0.55	2.42
Debt-Equity Ratio	0.53	0.09	0.10	0.79	0.13	0.28	0.32
Long-term Debt Ratio	0.0341	0.009	0.0091	0.0925	0.0407	0.0808	0.04

5.1.3 Analysis of Capital Structures of Engineering Industry of 2008

In the following table shows the overall position of assets and capital structure , Debt-Equity Ratio, Debt to Total Asset, and Long-Term Debt Ratio of the selected engineering industries as at the end of the year 2008 and also the average of all these of the selected six companies, which is used for analyzing the position of individual companies:

Table 5-3: Overall Capital Structure of Selected engineering Companies of 2008

[Figure in million Taka]

	Singer Bangladesh Limited	Aftab Automobile Limited	Atlas Bangladesh Limited	Bangladesh Thai Aluminium	Monno Jute Stafflers Limited	Eastern Cables Limited	Industry Average
Debt-Equity Ratio	2.1	0.28	0.30	0.64	0.20	0.50	0.67
Debt-Asset Ratio	0.49	0.4	0.15	0.35	0.11	0.26	0.29
Long term Debt Ratio	0.05	0.00764	0.008	0.0474	0.0392	0.0807	0.038

5.1.4 Analysis of Capital Structures of Engineering Industry of 2009

In the following table shows the overall position of assets and capital structure , Debt-Equity Ratio, Debt to Total Asset, and Long-Term Debt Ratio of the selected engineering industries as at the end of the year 2009 and also the average of all these of the selected six companies, which is used for analyzing the position of individual companies:

Table 5-4: Overall Capital Structure of Selected engineering Companies of 2009

[Figure in million Taka]

	Singer Bangladesh Limited	Aftab Automobile Limited	Atlas Bangladesh Limited	Bangladesh Thai Aluminium	Monno Jute Stafflers Limited	Eastern Cables Limited	Industry Average
Debt-Asset Ratio	0.29	0.94	0.53	0.59	0.16	0.3756	0.48
Debt-Equity Ratio	0.1437	0.35	0.229	0.340	0.093	0.213	0.23
Long-term Debt Ratio	0.0366	0.007	0.0055	0.045	0.028	0.088	0.035

5.1.5 Analysis of Capital Structures of Engineering Industry of 2010

In the following table shows the overall position of assets and capital structure , Debt-Equity Ratio, Debt to Total Asset, and Long-Term Debt Ratio of the selected engineering industries as at the end of the year 2010 and also the average of all these of the selected six companies, which is used for analyzing the position of individual companies:

Table 5-5: Overall Capital Structure of Selected engineering Companies of 2010

[Figure in million Taka]

	Singer Bangladesh Limited	Aftab Automobile Limited	Atlas Bangladesh Limited	Bangladesh Thai Aluminium	Monno Jute Stafflers Limited	Eastern Cables Limited	Industry Average
Debt- Asset Ratio	0.12	0.11	0.30	0.39	0.49	0.43	0.24
Debt- Equity Ratio	0.0007	0.12	0.15	0.27	0.25	0.23	0.13
Long- term Debt Ratio	0	0.0054	0.0033	0.037	0.024	0.083	0.019

Test of the Hypotheses

5.2 Relationship between the Asset Growth Rate and Debt Ratio

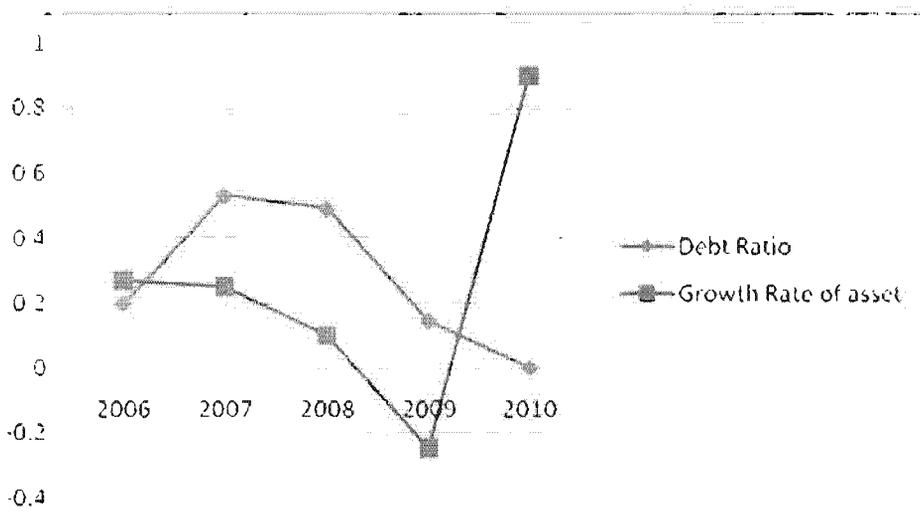
Empirically, the relationship between growth opportunity and level of leverage experiences controversy. According to agency cost theory, agency cost is likely to be higher for growing companies having wider choice of future investment. Hence, growth rate is negatively related with long-term debt level (Jensen and Meckling 1976). This conclusion is supported by the empirical studies done by Kim and Sorensen (1986), Titman and Wessels (1988), Barclay et al. (1995) and Rajan and Zingales (1995) but Kester rejected this relation (1986). According to trade-off theory, companies with high growth opportunities use limited debt because in the case of bankruptcy, the value of high growth opportunities is close to zero, (Myers, 1984; Williamson, 1988 and Harris and Raviv, 1990). Firms with less growth prospects should use debt because it has a disciplinary role (Jensen, 1986; Stulz, 1990). Pecking order theory, contrary to the agency cost theory, shows positive relation between growth rate and leverage of growing enterprises. This is because a higher growth rate implies a higher demand for funds, and, ceteris paribus, a greater reliance on external financing through the preferred source of debt (Sinha 1992), (Myers 1984). Thus, the pecking order theory suggests a higher proportion of debt in capital structure of the growing companies than that of the stagnant no-growth companies. However, Chaplinsky and Niehaus (1990), Chung (1993), have got the evidence contrary to the pecking order theory. Chowdhury (2004) also expected a positive sign between growth opportunities and leverage but found a negative relationship between the two. A common proxy for growth opportunities is the compounded growth in assets for last five years.

We will reject H_{01} , if $r^2 \geq 0.50$

We have tried to find the relationship between Asset Growth Rate and Debt Ratio of selected engineering industry:

Singer Bangladesh Limited

Year	Debt Ratio	Growth Rate of asset
2006	0.197	0.27
2007	0.53	0.25
2008	0.49	0.10
2009	0.1437	-0.25
2010	0.0007	0.90

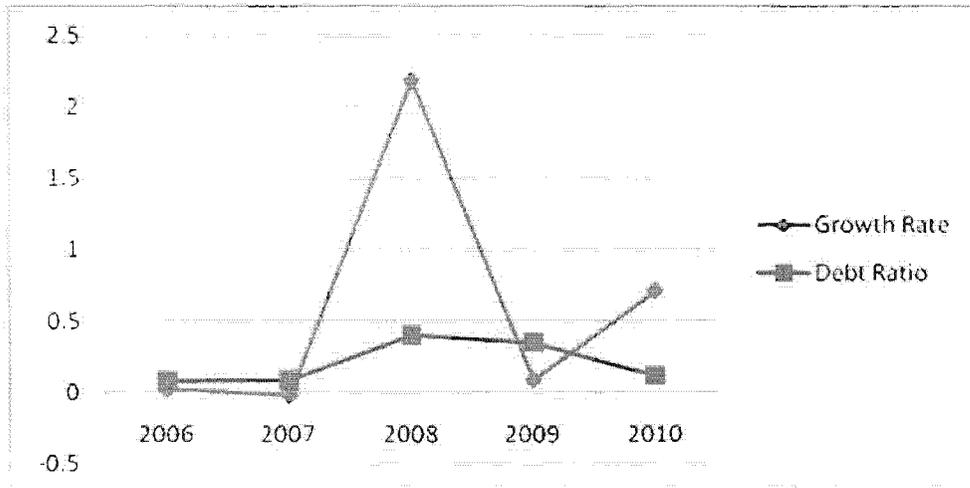


Correlation of dependent variable (Debt Ratio) with independent variable (Asset growth rate) for Singer Bangladesh Limited

Correlation	Values	Comments
r	-0.09	There is weak negative relationship between debt ratio and asset growth rate
r^2	0.008	No significant relationship

Aftab Automobile Limited

Year	Debt Ratio	Growth Rate of asset
2006	0.08	0.01
2007	0.09	-0.01
2008	0.4	2.20
2009	0.35	0.10
2010	0.12	0.70

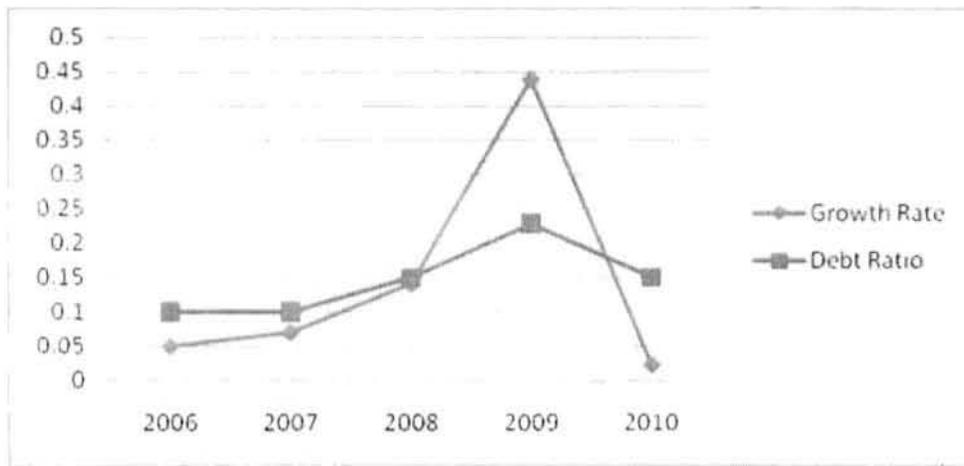


Correlation of dependent variable (Debt Ratio) with independent variable (Asset growth rate) for Aftab Automobile Limited:

Correlation	Values	Comments
r	-0.621	There is weak negative relationship between debt ratio and asset growth rate
r^2	0.385	No significant relationship

Atlas Bangladesh Limited

Year	Debt Ratio	Growth Rate of asset
2006	0.10	0.05
2007	0.10	0.07
2008	0.15	0.14
2009	0.229	0.44
2010	0.15	0.02

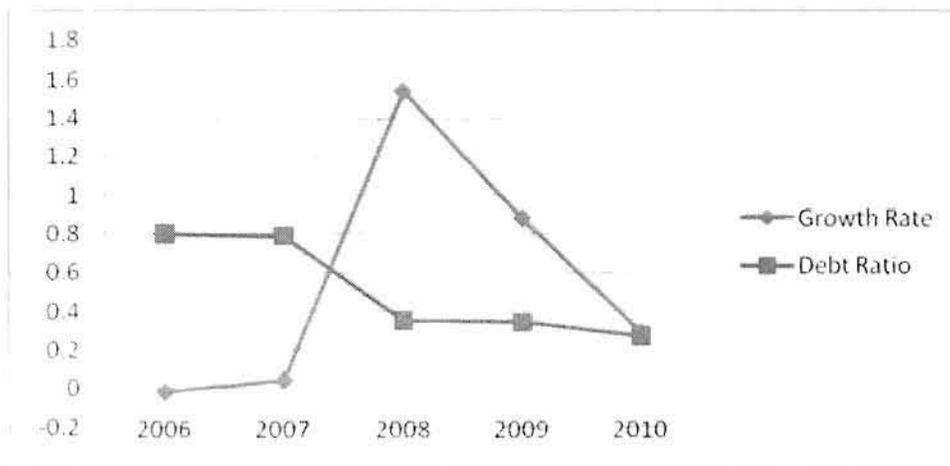


Correlation of dependent variable (Debt Ratio) with independent variable (Asset growth rate) for Atlas Bangladesh Limited:

Correlation	Values	Comments
r	0.879	There is strong positive relationship between debt ratio and asset growth rate
r^2	0.772	Well fitted / Significant relationship

Bangladesh Thai Aluminium Limited

Year	Debt Ratio	Growth Rate of asset
2006	0.80	-0.05
2007	0.79	0.05
2008	0.35	1.55
2009	0.34	0.90
2010	0.27	0.30

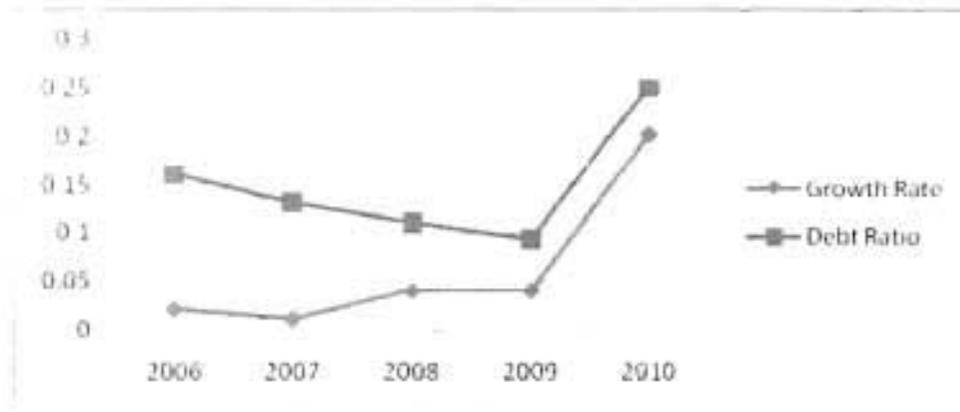


Correlation of dependent variable (Debt Ratio) with independent variable (Asset growth rate) for Bangladesh Thai Aluminium Limited:

Correlation	Values	Comments
r	-0.676	There is weak negative relationship between debt ratio and asset growth rate
r^2	0.457	Not well fitted / No significant relationship

Monno Jute Stafflers Limited

Year	Debt Ratio	Growth Rate of asset
2006	0.16	0.025
2007	0.13	0.02
2008	0.11	0.04
2009	0.093	0.041
2010	0.25	0.20

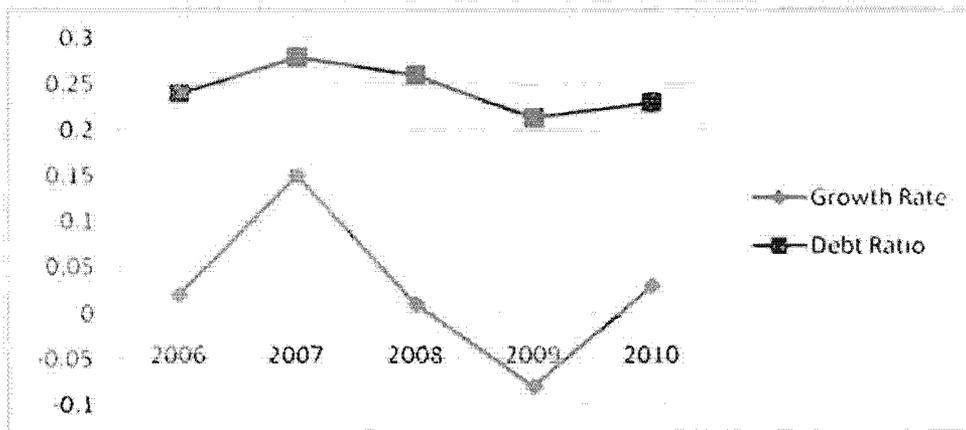


Correlation of dependent variable (Debt Ratio) with independent variable (Asset growth rate) for Monno Jute Stafflers Limited:

Correlation	Values	Comments
r	0.871	There is strong positive relationship between debt ratio and asset growth rate
r^2	0.758	Well fitted / Significant relationship

Eastern Cables Limited

Year	Debt Ratio	Growth Rate of asset
2006	0.24	0.02
2007	0.28	0.15
2008	0.26	0.01
2009	0.213	-0.07
2010	0.23	0.03



Correlation of dependent variable (Debt Ratio) with independent variable (Asset growth rate) for Eastern Cables Limited:

Correlation	Values	Comments
r	0.87	There is strong positive relationship between debt ratio and asset growth rate
r^2	0.756	Well fitted / Significant relationship

Correlation of dependent variable (Debt Ratio) with independent variable (Asset growth rate) for engineering industry of Bangladesh

Correlation	Values	Comments
r	0.05	There is week positive relationship between debt ratio and asset growth rate
r^2	0.002	Not well fitted / No significant relationship

Here, $r = 0.05$ which means Debt Ratio and Market Price of Share have week positive relationship.

And $r^2 = 0.002$ which is less than 0.5 ($r^2 < 0.002$). We can not reject H_{c1} . So There is no significant relationship between Debt Ratio and Market Price of Share.

H_{c1} is not well fitted.

From the above it can be concluded that the relationship between debt ratio and asset growth rate is weekly positive but the relationship is not significant in case of engineering industries of Bangladesh.

5.3 Relationship between the Operating Leverage and Debt Ratio

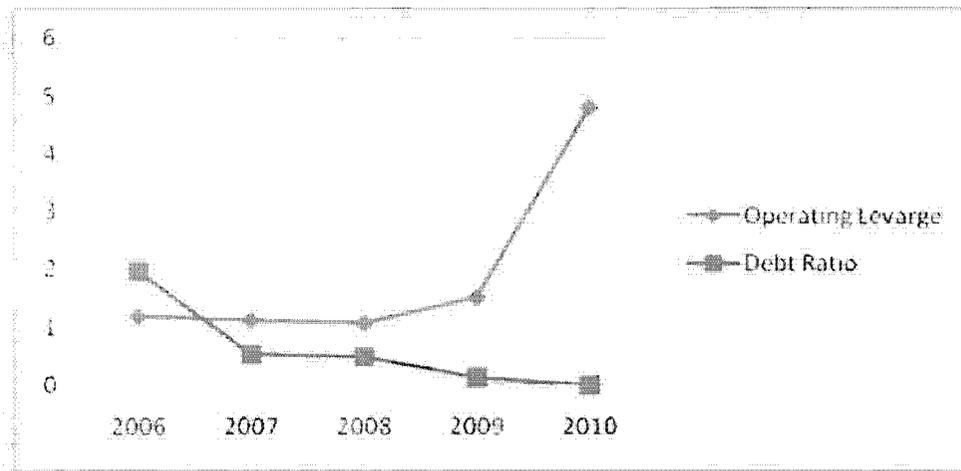
Operating leverage is defined as the use of fixed costs in the operation of a firm. A firm has a high degree of operating leverage if it employs a greater amount of fixed costs and a small amount of variable costs and vice versa. Operating leverage affects the capital structure. The high degree of operating leverage i.e. use of higher proportion of fixed cost in the total costs over a period of time can intensify the variability in future earnings. Both the bankruptcy cost theory and agency cost theory predict the negative relation between operating leverage and debt level. As per bankruptcy cost theory, higher operating leverage enhances the chance of business failure and the greater amount of bankruptcy costs to be incurred. From this point of view, trade-off theory says that high degree of operating leverage raises the marginal costs of debt and lowers the level of debt as well. Considering the high chances of bankruptcy costs to be incurred, pecking order theory also suggests that a firm should use contractually obliged debt less and rely more on retained earnings. Thus, all these theories suggest that as operating leverage increases, the debt level in capital structure of the enterprises should decrease. Chowdhury (2004), in his study carried on both Japan and Bangladeshi firms, also found a result consistent with the prediction drawn by above mentioned theories. The proxy for the variable is the ratio of the percentage change in EBIT to the percentage change in sales.

We will reject H_{02} , if $r^2 \geq 0.50$

We have tried to find the relationship between Operating Leverage and Debt Ratio of selected engineering industry:

Singer Bangladesh Limited

Year	Debt Ratio	Operating Leverage
2006	1.97	1.17
2007	0.53	1.10
2008	0.49	1.04
2009	0.1437	1.50
2010	0.0007	4.80

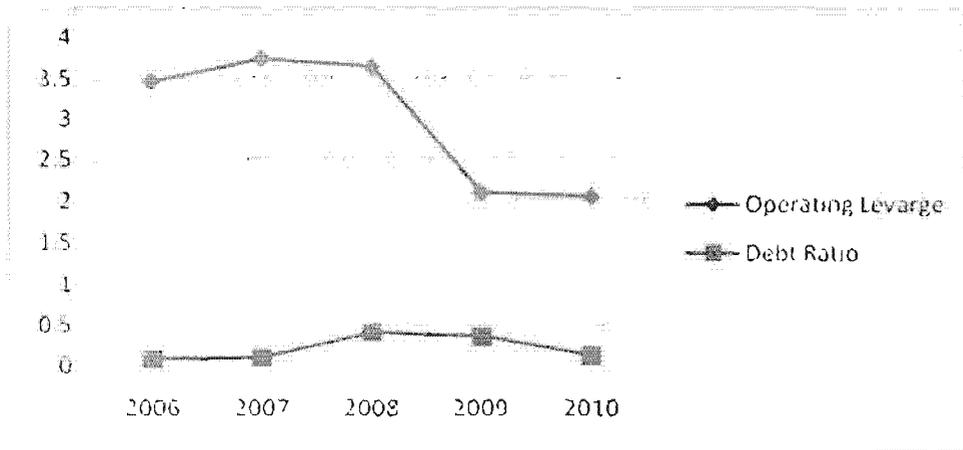


Correlation of dependent variable (Debt Ratio) with independent variable (Operating Leverage) for Singer Bangladesh Limited:

Correlation	Values	Comments
r	-0.476	There is week negative relationship between debt ratio and operating leverage
r^2	0.226	Not well fitted / No significant relationship

Aftab Automobile Limited

Year	Debt Ratio	Operating Leverage
2006	0.08	3.45
2007	0.09	3.70
2008	0.40	3.61
2009	0.35	2.10
2010	0.12	2.047

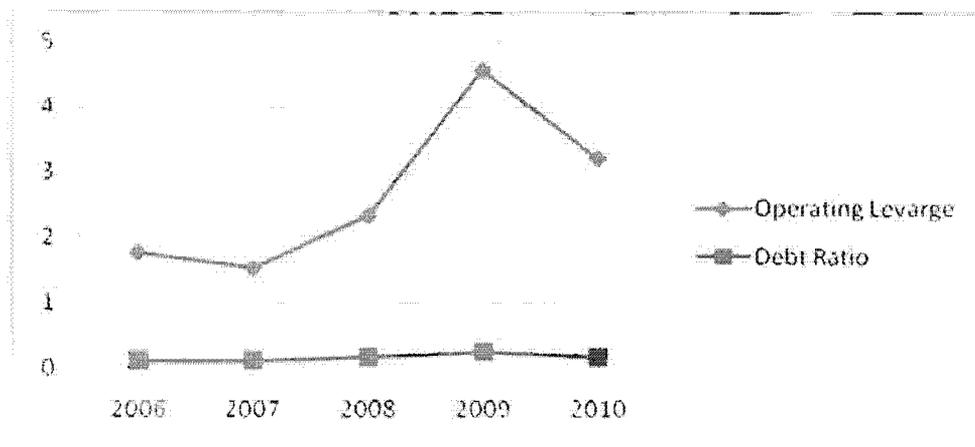


Correlation of dependent variable (Debt Ratio) with independent variable (Operating Leverage) for Aftab Automobile Limited:

Correlation	Values	Comments
r	-0.29	There is weak negative relationship between debt ratio and operating leverage
r^2	0.084	Not well fitted / No significant relationship

Atlas Bangladesh Limited

Year	Debt Ratio	Operating Leverage
2006	0.10	1.75
2007	0.10	1.55
2008	0.15	2.30
2009	0.229	4.60
2010	0.15	3.20

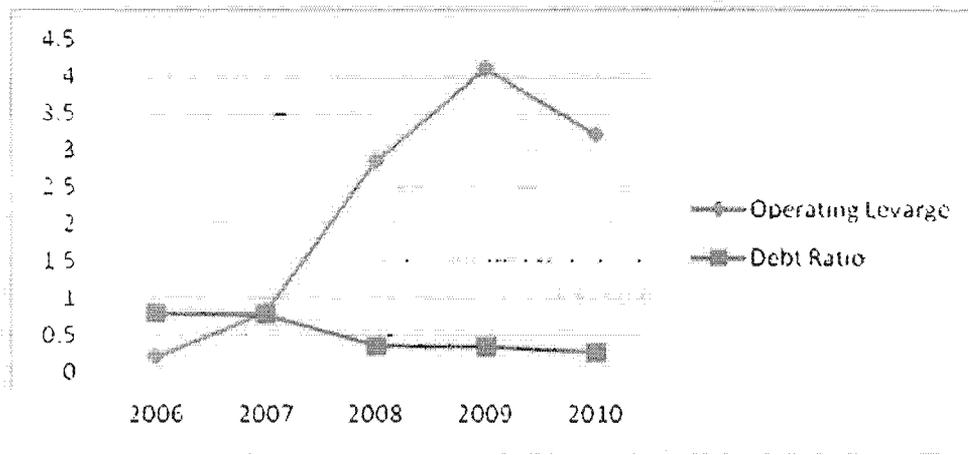


Correlation of dependent variable (Debt Ratio) with independent variable (Operating Leverage) for Atlas Bangladesh Limited:

Correlation	Values	Comments
r	0.965	There is strong positive relationship between debt ratio and operating leverage
r^2	0.932	Well fitted / Significant relationship

Bangladesh Thai Aluminium Limited

Year	Debt Ratio	Operating Leverage
2006	0.8	0.2
2007	0.79	0.78
2008	0.35	2.8
2009	0.34	4.1
2010	0.27	3.2

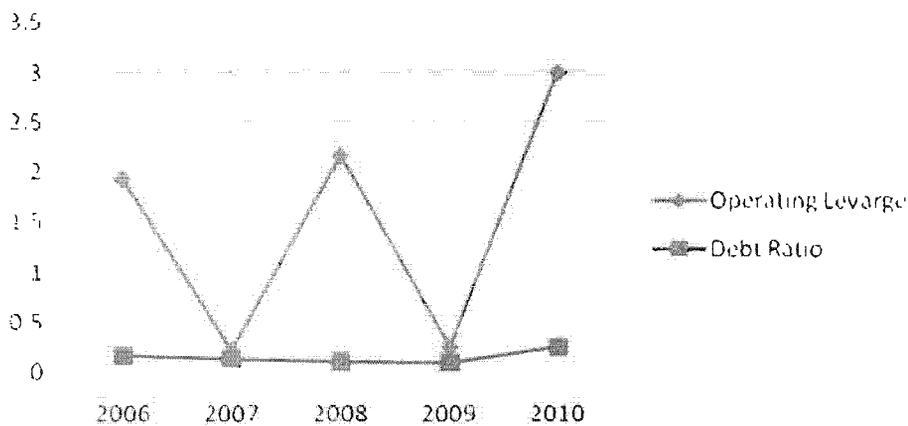


Correlation of dependent variable (Debt Ratio) with independent variable (Operating Leverage) for Bangladesh Thai Aluminium Limited:

Correlation	Values	Comments
r	-0.944	There is strong negative relationship between debt ratio and operating leverage
r^2	0.891	Well fitted / Significant relationship

Monno Jute Stafflers Limited

Year	Debt Ratio	Operating Leverage
2006	0.16	1.9
2007	0.13	0.2
2008	0.11	2.2
2009	0.093	0.3
2010	0.25	3.011

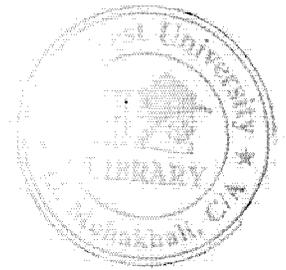
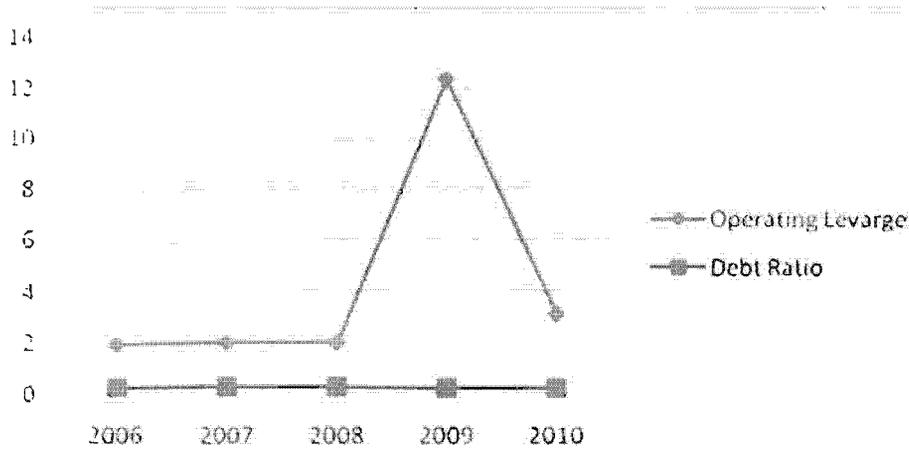


Correlation of dependent variable (Debt Ratio) with independent variable (Operating Leverage) for Monno Jute Stafflers Limited:

Correlation	Values	Comments
r	0.727	There is strong positive relationship between debt ratio and operating leverage
r^2	0.529	Well fitted / Significant relationship

Eastern Cables Limited

Year	Debt Ratio	Operating Leverage
2006	0.24	1.98
2007	0.28	2.001
2008	0.26	2.008
2009	0.213	12.1
2010	0.23	3.06



Correlation of dependent variable (Debt Ratio) with independent variable (Operating Leverage) for Eastern Cables Limited:

Correlation	Values	Comments
r	-0.724	There is strong negative relationship between debt ratio and operating leverage
r^2	0.524	Well fitted / Significant relationship

Correlation of dependent variable (Debt Ratio) with independent variable (Operating Leverage) for engineering industry of Bangladesh:

Correlation	Values	Comments
r	-0.231	There is week negative relationship between debt ratio and operating leverage
r^2	0.053	Not well fitted / No significant relationship

Here, $r = -0.231$ which means Debt Ratio and Market Price of Share have week negative relationship.

And $r^2 = 0.053$ which is less than 0.5 ($r^2 < 0.053$). We can not reject H_{02} . So There is no significant relationship between Debt Ratio and Market Price of Share.

H_{02} is not well fitted.

From the above it can be concluded that the relationship between debt ratio and operating leverage is weekly positive but the relationship is not significant in case of engineering industries of Bangladesh.

5.4 Relationship between the Financial Leverage and Debt Ratio:

The degree to which an investor or business is utilizing Borrowed money. Companies that are highly leveraged may be at risk of bankruptcy if they are unable to make payments on their debt; they may also be unable to find new lenders in the future. Financial leverage is not always bad, however; it can increase the shareholders' return on investment and often there are tax advantages associated with borrowing.

A financial leverage is a use of borrowed money to achieve more efficient capital structure. A borrowed capital is cheaper than equity capital most of the times. So usage of borrowed money makes weighted average capital cost (WACC) lower if done properly.

In corporate finance financial leverage is used for development of an activity or acquisitions. Most big companies are using borrowed money to grow larger. The bigger share of borrowed capital, the higher financial leverage and risk is. Usually such ratios are used to measure company's indebtedness level.

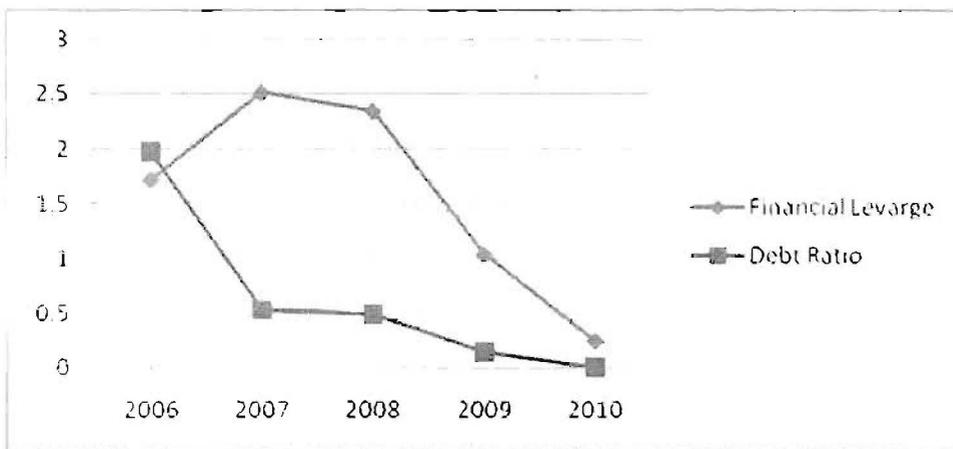
In investment financial leverage mostly is used by hedge funds, also by some private investors. Repo contracts or margin trading are main instruments to use financial leverage in an investment portfolio. Financial leverage in investment may help to achieve faster results when market is growing, but it extremely risky in volatile markets.

We will reject H_{0a} , if $r^2 \geq 0.50$

We have tried to find the relationship between Financial Leverage and Debt Ratio of selected engineering industry:

Singer Bangladesh Limited

Year	Debt Ratio	Financial Leverage
2006	1.97	1.74
2007	0.53	2.57
2008	0.49	2.39
2009	0.1437	1.17
2010	0.0007	0.25



Correlation of dependent variable (Debt Ratio) with independent variable (Financial Leverage) for Singer Bangladesh Limited:

Correlation	Values	Comments
r	0.35	There is weak positive relationship between debt ratio and financial leverage

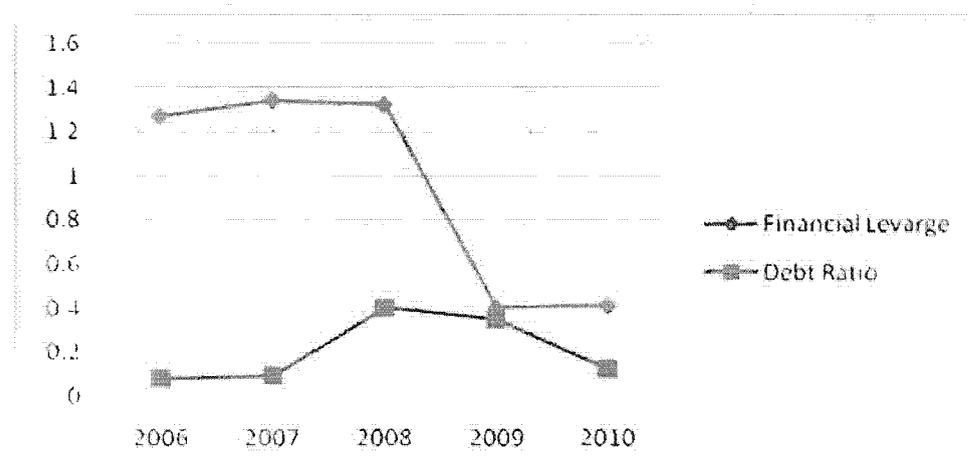
r^2

0.122

Not well fitted / No significant relationship

Aftab Automobile Limited

Year	Debt Ratio	Financial Leverage
2006	0.08	1.28
2007	0.09	1.32
2008	0.40	1.301
2009	0.35	0.40
2010	0.12	0.401



Correlation of dependent variable (Debt Ratio) with independent variable (Financial Leverage) for Aftab Automobile Limited:

Correlation	Values	Comments
r	0.139	There is weak positive relationship between debt ratio and financial leverage

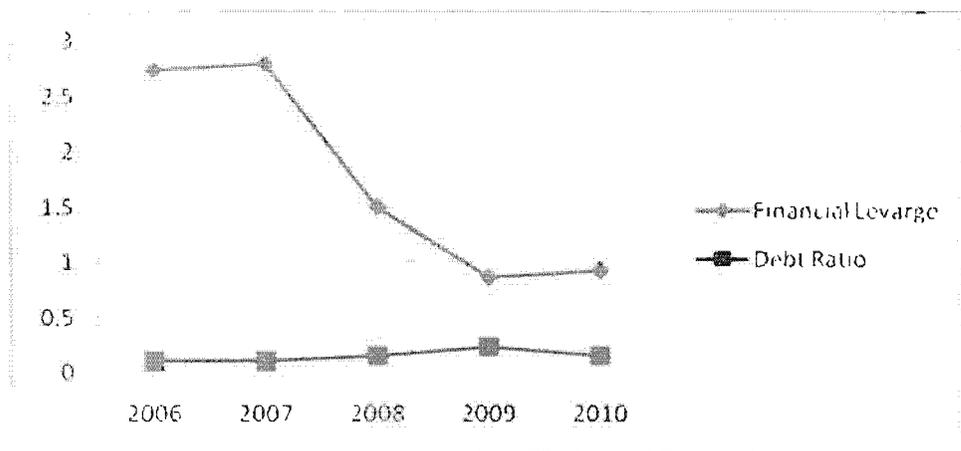
r^2

0.019

Not well fitted / No significant relationship

Atlas Bangladesh Limited

Year	Debt Ratio	Financial Leverage
2006	0.10	2.73
2007	0.10	2.78
2008	0.15	1.50
2009	0.229	0.80
2010	0.15	0.92



Correlation of dependent variable (Debt Ratio) with independent variable (Financial Leverage) for Atlas Bangladesh Limited:

Correlation	Values	Comments
r	-0.868	There is strong negative relationship between debt ratio and financial leverage

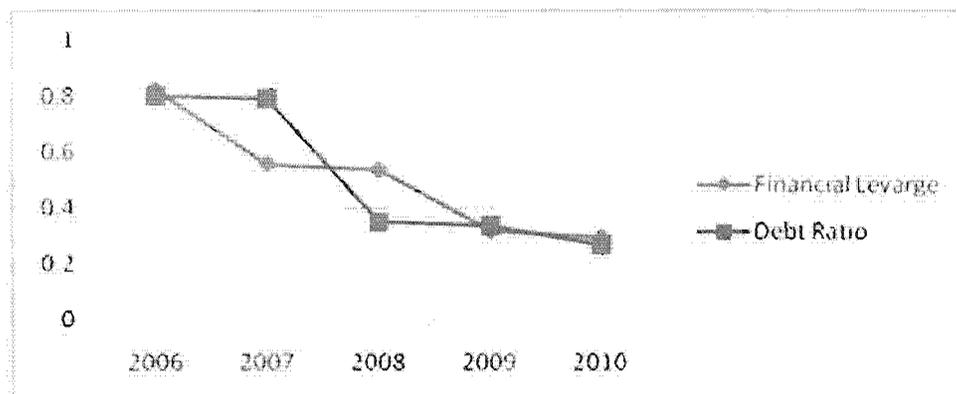
r^2

0.753

Well fitted / Significant relationship

Bangladesh Thai Aluminium Limited

Year	Debt Ratio	Financial Leverage
2006	0.80	0.82
2007	0.79	0.57
2008	0.35	0.54
2009	0.34	0.31
2010	0.27	0.29



Correlation of dependent variable (Debt Ratio) with independent variable (Financial Leverage) of Bangladesh Thai Aluminium Limited:

Correlation	Values	Comments
r	0.833	There is strong positive relationship between debt ratio and asset growth rate

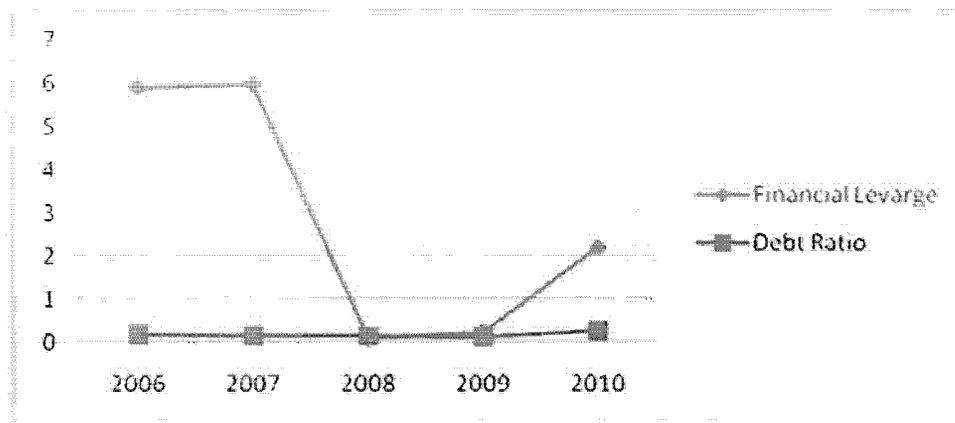
r^2

0.695

Well fitted / Significant relationship

Monno Jute Stafflers Limited

Year	Debt Ratio	Financial Leverage
2006	0.16	5.92
2007	0.13	5.98
2008	0.11	0.01
2009	0.093	0.03
2010	0.25	2.21



Correlation of dependent variable (Debt Ratio) with independent variable (Financial Leverage) for Monno Jute Stafflers Limited:

Correlation

Values

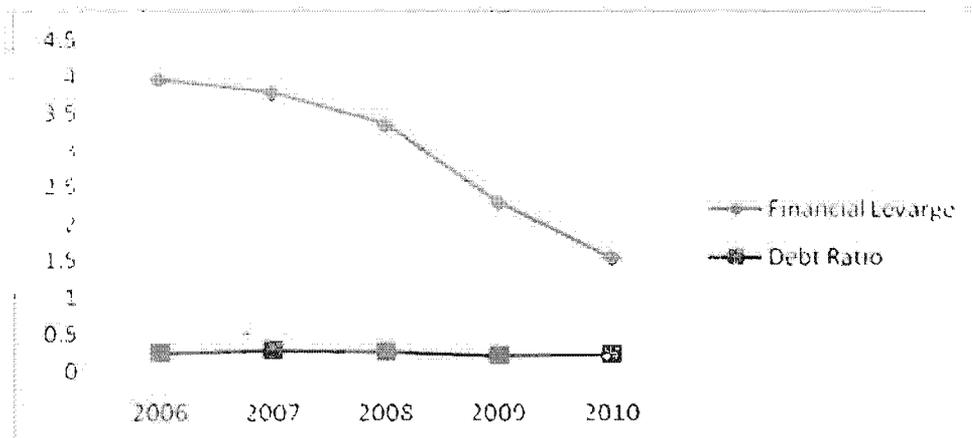
Comments

r 0.241 There is weak positive relationship between debt ratio and asset growth rate

r^2 0.058 Not well fitted / No significant relationship

Eastern Cables Limited

Year	Debt Ratio	Financial Leverage
2006	0.24	3.90
2007	0.28	3.75
2008	0.26	3.39
2009	0.213	2.23
2010	0.23	1.51



Correlation of dependent variable (Debt Ratio) with independent variable (Financial Leverage) for Eastern Cables Limited:

Correlation	Values	Comments
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r	0.686	There is week positive relationship between debt ratio and asset growth rate
r^2	0.471	Not well fitted / No significant relationship

Correlation of dependent variable (Debt Ratio) with independent variable (Financial Leverage) for engineering industry of Bangladesh:

Correlation	Values	Comments
r	-0.062	There is week negative relationship between debt ratio and asset growth rate
r^2	0.004	Not well fitted / No significant relationship

Here, $r = -0.062$ which means Debt Ratio and Market Price of Share have week negative relationship.

And $r^2 = 0.004$ which is less than 0.5 ($r^2 < 0.004$). We can not reject H_{0a} . So There is no significant relationship between Debt Ratio and Market Price of Share.

H_{0a} is not well fitted.

From the above it can be concluded that the relationship between debt ratio and financial leverage is weekly positive but the relationship is not significant in case of engineering industries of Bangladesh.



5.5 Relationship between the Tangibility Ratio and Debt Ratio

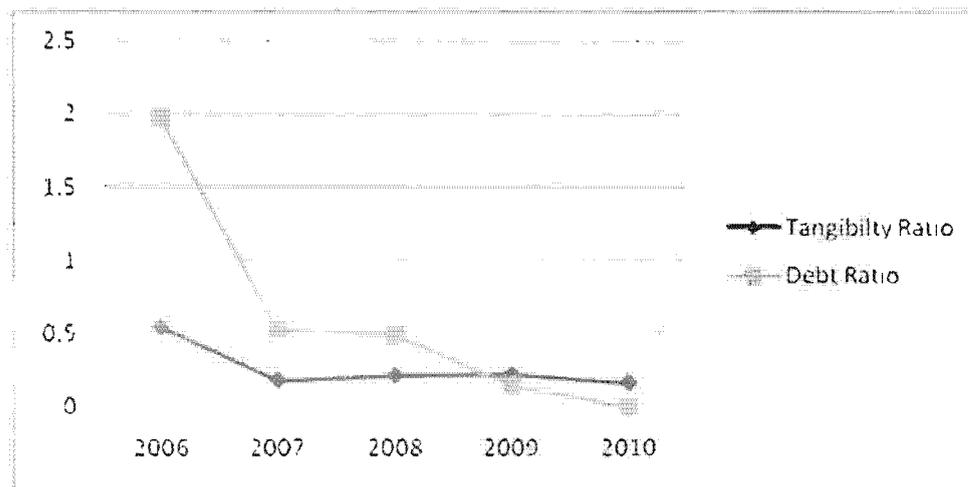
Capital structure theories generally state that tangibility is positively related to leverage. Jensen and Meckling (1976) in their pioneering paper on agency cost, ownership and capital structure, point out that "the agency cost of debt exists as the firm may shift to riskier investment after the issuance of debt, and transfer wealth from debt holders to shareholders to exploit to the option nature of equity. If a firm's tangible assets are high, then these assets can be used as collateral, diminishing the lender's risk of suffering such agency costs of debt". Hence, a high ratio of tangible assets is expected to give rise to high leverage ratio. The trade-off theory also supports such prediction. Moreover, liquidation value of tangible assets should be higher than that of intangible assets in the event of bankruptcy. Williamson (1988) and Harris and Raviv (1990) suggest leverage should increase with liquidation value and both papers suggest that leverage is positively correlated with tangibility. This prediction is confirmed by several well-known empirical studies like Marsh (1982), Long and Malitz (1985), Friend and Lang (1988), Rajan and Zingales (1995), Wald (1999). According to pecking order theory, a firm with more tangible assets has less information asymmetry problem. This theory says that less information asymmetry problems imply a higher preference for equity and lower dependence on debt thus leading to a negative relation between the tangible assets and leverage (Harris and Raviv, 1991). The ratio of tangible assets to total assets is selected as a proxy for tangibility of assets.

We will reject H_{04} , if $r^2 \geq 0.50$

We have tried to find the relationship between Tangible Asset to Total Asset Ratio and Debt Ratio of selected engineering industry:

Singer Bangladesh Limited

Year	Debt Ratio	Tangibility Ratio
2006	1.97	0.54
2007	0.53	0.18
2008	0.49	0.21
2009	0.1437	0.22
2010	0.0007	0.16

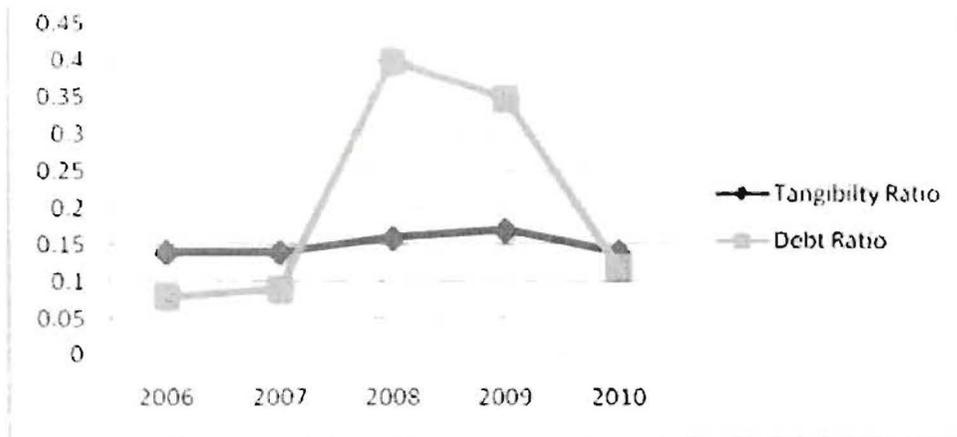


Correlation of dependent variable (Debt Ratio) with independent variable (Tangibility Ratio) of Singer Bangladesh Limited:

Correlation	Values	Comments
r	0.959	There is strong positive relationship between debt ratio and tangibility ratio
r^2	0.919	Well fitted / Significant relationship

Aftab Automobile Limited

Year	Debt Ratio	Tangibility Ratio
2006	0.08	0.14
2007	0.09	0.14
2008	0.4	0.16
2009	0.35	0.17
2010	0.12	0.14

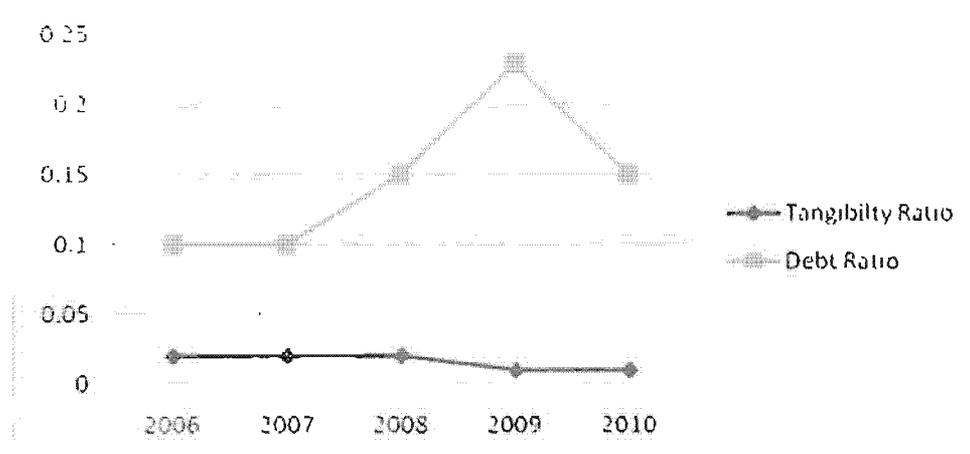


Correlation of dependent variable (Debt Ratio) with independent variable (Tangibility Ratio) of Aftab Automobile Limited:

Correlation	Values	Comments
r	-0.339	There is week negative relationship between debt ratio and tangibility ratio
r^2	0.115	Not well fitted / No significant relationship

Atlas Bangladesh Limited

Year	Debt Ratio	Tangibility Ratio
2006	0.1	0.02
2007	0.1	0.02
2008	0.15	0.02
2009	0.229	0.01
2010	0.15	0.01

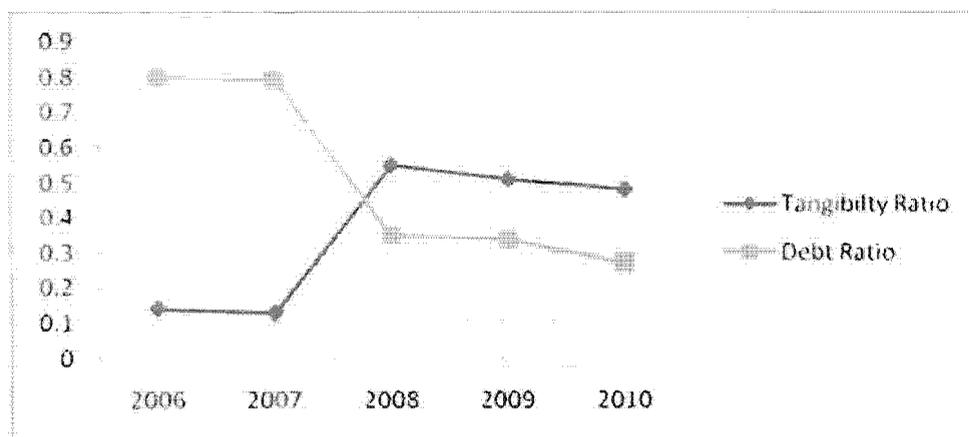


Correlation of dependent variable (Debt Ratio) with independent variable (Tangibility Ratio) of Atlas Bangladesh Limited:

Correlation	Values	Comments
r	-0.755	There is strong negative relationship between debt ratio and tangibility ratio
r^2	0.571	Well fitted / Significant relationship

Bangladesh Thai Aluminium Limited

Year	Debt Ratio	Tangibility Ratio
2006	0.8	0.14
2007	0.79	0.13
2008	0.35	0.55
2009	0.34	0.51
2010	0.27	0.48

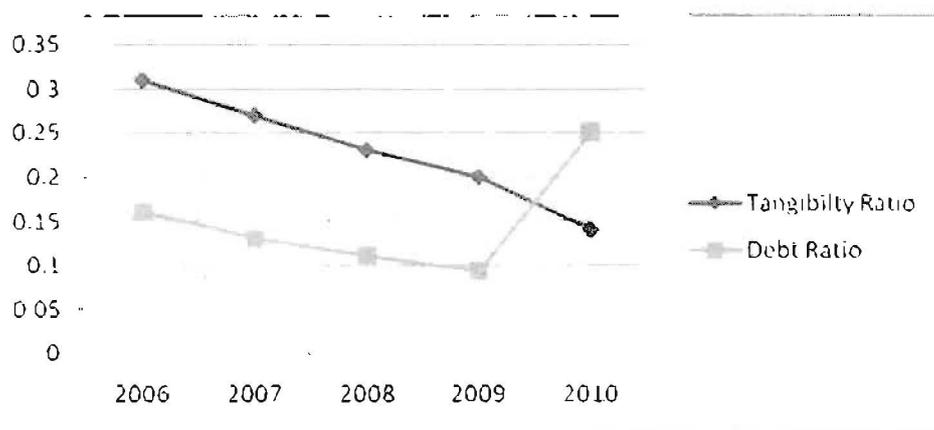


Correlation of dependent variable (Debt Ratio) with independent variable (Tangibility Ratio) of Bangladesh Thai Aluminium Limited:

Correlation	Values	Comments
r	-0.973	There is strong negative relationship between debt ratio and tangibility ratio
r^2	0.947	Well fitted / Significant relationship

Monno Jute Stafflers Limited

Year	Debt Ratio	Tangibility Ratio
2006	0.16	0.31
2007	0.13	0.27
2008	0.11	0.23
2009	0.093	0.2
2010	0.25	0.14

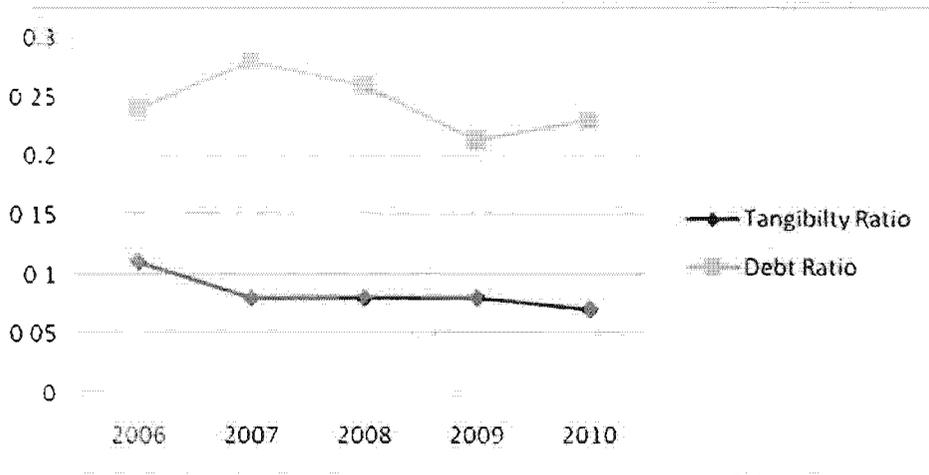


Correlation of dependent variable (Debt Ratio) with independent variable (Tangibility Ratio) of Monno Jute Stafflers Limited:

Correlation	Values	Comments
r	0.487	There is weak positive relationship between debt ratio and tangibility ratio
r^2	0.238	Not well fitted / No significant relationship

Eastern Cables Limited

Year	Debt Ratio	Tangibility Ratio
2006	0.24	0.11
2007	0.28	0.08
2008	0.26	0.08
2009	0.213	0.08
2010	0.23	0.07



Correlation of dependent variable (Debt Ratio) with independent variable (Tangibility Ratio) of Eastern Cables Limited:

Correlation	Values	Comments
r	0.019	There is week positive relationship between debt ratio and tangibility ratio
r^2	0.0001	Not well fitted / No significant relationship

Correlation of dependent variable (Debt Ratio) with independent variable (Tangibility Ratio) of engineering industry of Bangladesh:

Correlation	Values	Comments
r	0.436	There is week positive relationship between debt ratio and asset growth rate
r^2	0.019	Not well fitted / No significant relationship

Here, $r = 0.436$ which means Debt Ratio and Market Price of Share have weak positive relationship.

And $r^2 = 0.019$ which is less than 0.5 ($r^2 < 0.019$). We can not reject H_{04} . So There is no significant relationship between Debt Ratio and Market Price of Share.

H_{04} is not well fitted.

From the above it can be concluded that the relationship between debt ratio and tangible asset to total asset ratio is weakly positive but the relationship is not significant in case of engineering industries of Bangladesh.

5.6 Relationship between the Debt Ratio and Cost of Capital

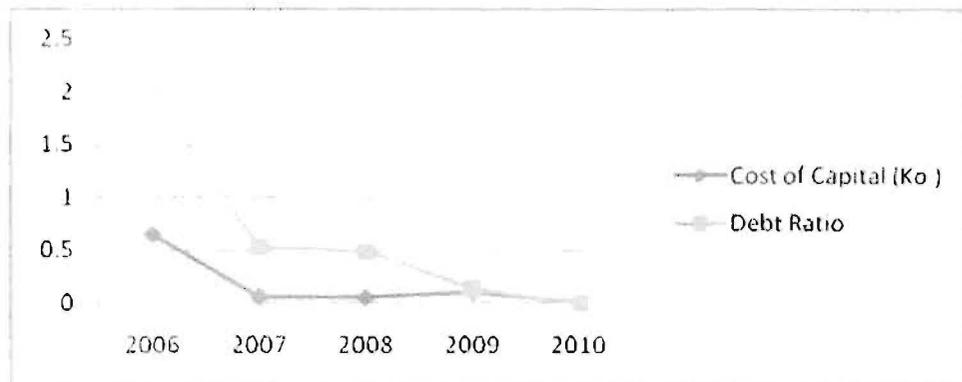
We will reject H_{05} , if $r^2 \geq 0.50$

We have tried to find the relationship between Cost of Capital (K_0) and Debt Ratio of selected engineering industry:

Singer Bangladesh Limited

Year	Debt Ratio	Cost of capital
2006	1.97	0.69

2007	0.53	0.11
2008	0.49	0.13
2009	0.1437	0.19
2010	0.0007	0.05

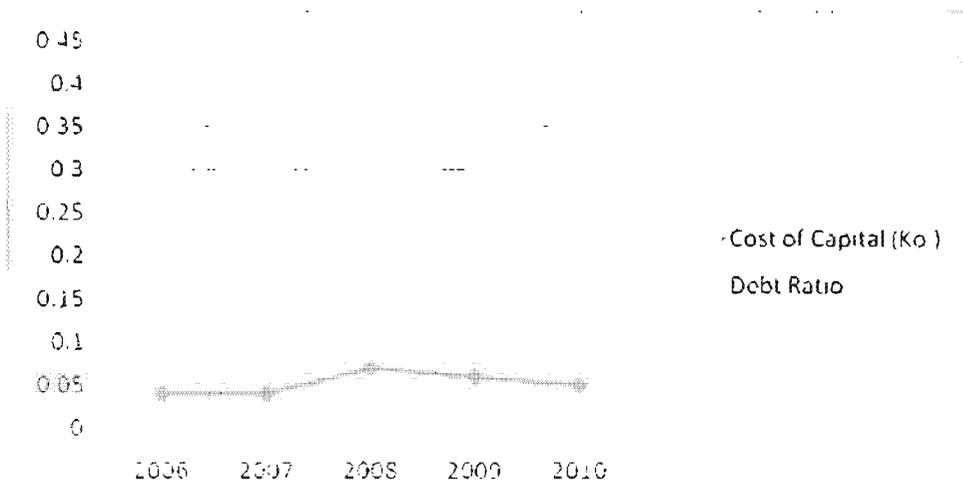


Correlation of dependent variable (Debt Ratio) with independent variable (Cost of capital) of Singer Bangladesh Limited:

Correlation	Values	Comments
r	0.952	There is strong positive relationship between debt ratio and cost of capital
r^2	0.906	Well fitted / Significant relationship

Aftab Automobile Limited

Year	Debt Ratio	Cost of capital
2006	0.08	0.04
2007	0.09	0.04
2008	0.40	0.07
2009	0.35	0.06
2010	0.12	0.05

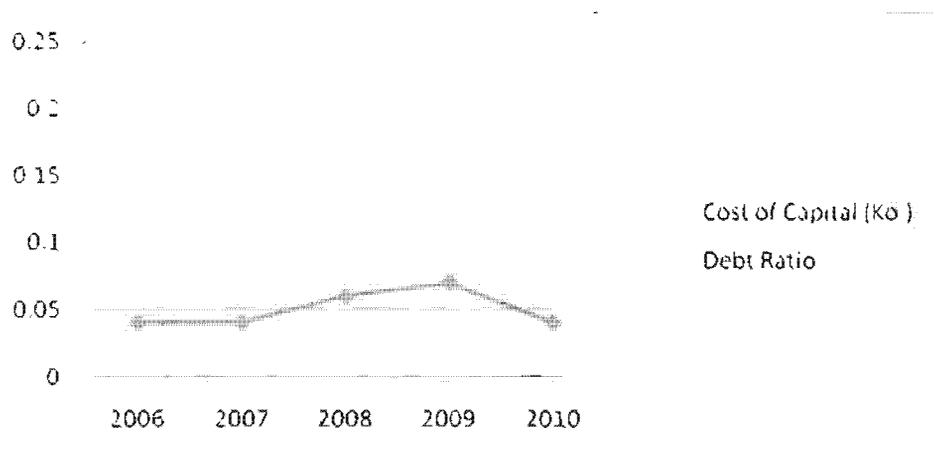


Correlation of dependent variable (Debt Ratio) with independent variable (Cost of capital) of Aftab Automobile Limited:

Correlation	Values	Comments
r	-0.338	There is weak negative relationship between debt ratio and cost of capital
r^2	0.115	Not well fitted / No significant relationship

Atlas Bangladesh Limited

Year	Debt Ratio	Cost of capital
2006	0.10	0.04
2007	0.10	0.04
2008	0.15	0.06
2009	0.229	0.07
2010	0.15	0.04

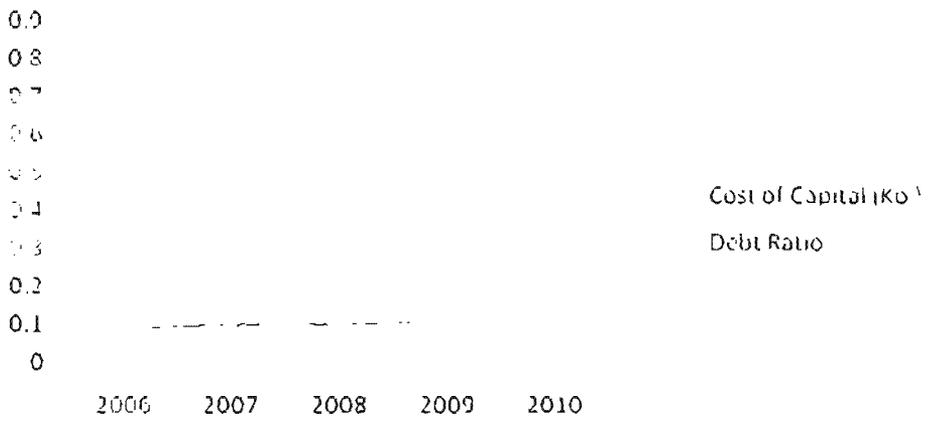


Correlation of dependent variable (Debt Ratio) with independent variable (Cost of capital) of Atlas Bangladesh Limited:

Correlation	Values	Comments
r	0.864	There is strong positive relationship between debt ratio and cost of capital
r^2	0.746	Well fitted / Significant relationship

Bangladesh Tbai Aluminium Limited

Year	Debt Ratio	Cost of capital
2006	0.8	0.09
2007	0.79	1.01
2008	0.35	1.02
2009	0.34	1.05
2010	0.27	0.05

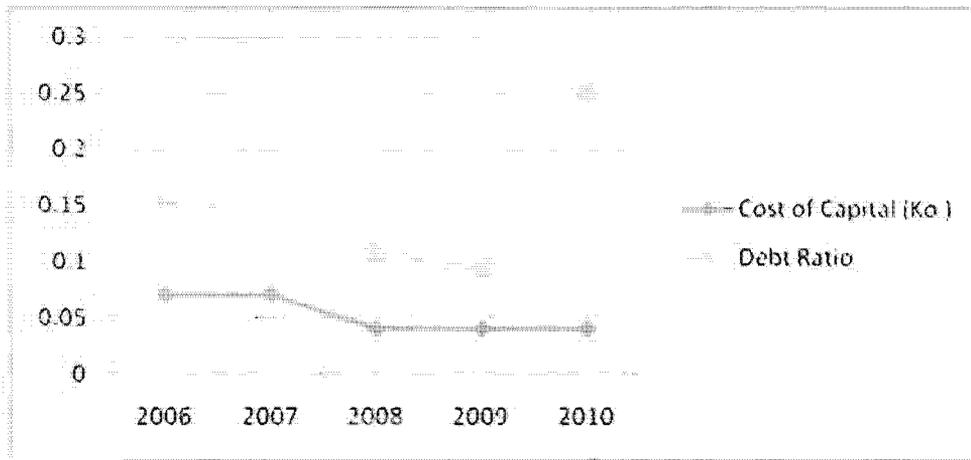


Correlation of dependent variable (Debt Ratio) with independent variable (Cost of capital) of Bangladesh Thai Aluminium Limited:

Correlation	Values	Comments
r	-0.083	There is weak negative relationship between debt ratio and cost of capital
r^2	0.007	Not well fitted / No significant relationship

Monno Jute Stafflers Limited

Year	Debt Ratio	Cost of capital
2006	0.16	0.07
2007	0.13	0.07
2008	0.11	0.04
2009	0.093	0.04
2010	0.25	0.04

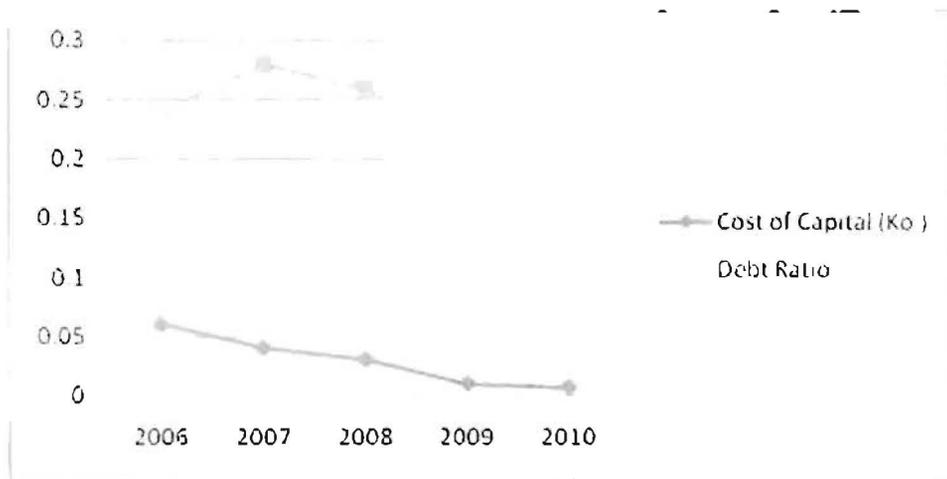


Correlation of dependent variable (Debt Ratio) with independent variable (Cost of capital) of Monno Jute Stafflers Limited:

Correlation	Values	Comments
r	-0.037	There is weak negative relationship between debt ratio and cost of capital
r^2	0.001	Not well fitted / No significant relationship

Eastern Cables Limited

Year	Debt Ratio	Cost of capital
2006	0.24	0.063
2007	0.28	0.041
2008	0.26	0.031
2009	0.213	0.019
2010	0.23	0.016



Correlation of dependent variable (Debt Ratio) with independent variable (Cost of capital) of Eastern Cables Limited:

Correlation	Values	Comments
r	0.40	There is weak positive relationship between debt ratio and Cost of capital
r^2	0.16	Not well fitted / No significant relationship

Correlation of dependent variable (Debt Ratio) with independent variable (Cost of capital) of engineering industry of Bangladesh:

Correlation	Values	Comments
r	0.487	There is weak positive relationship between debt ratio and Cost of capital
r^2	0.238	Not well fitted / No significant relationship

Here, $r = 0.487$ which means Debt Ratio and Market Price of Share have weak positive relationship.

And $r^2 = 0.238$ which is less than 0.5 ($r^2 < 0.238$). We can not reject H_{05} . So There is no significant relationship between Debt Ratio and Market Price of Share.

H_{05} is not well fitted.

From the above it can be concluded that the relationship between debt ratio and cost of capital is weakly positive but the relationship is not significant in case of engineering industries of Bangladesh.

5.7 Relationship between the Debt Ratio and Market Price of Share

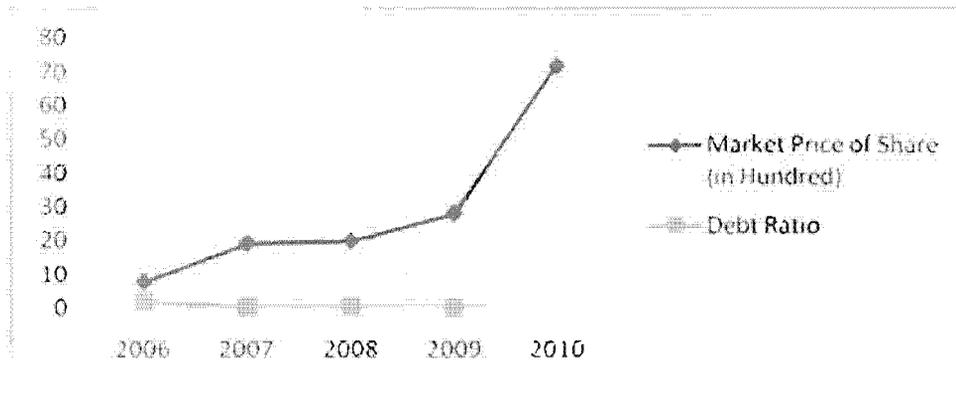
We will reject H_{05} , if $r^2 \geq 0.50$

We have tried to find the relationship between Market Price Share and Debt Ratio of selected engineering industry:

Singer Bangladesh Limited

Year	Debt Ratio	Market Price of Share
2006	1.97	7
2007	0.53	18.9
2008	0.49	19.23

2009	0.1437	27
2010	0.0007	73

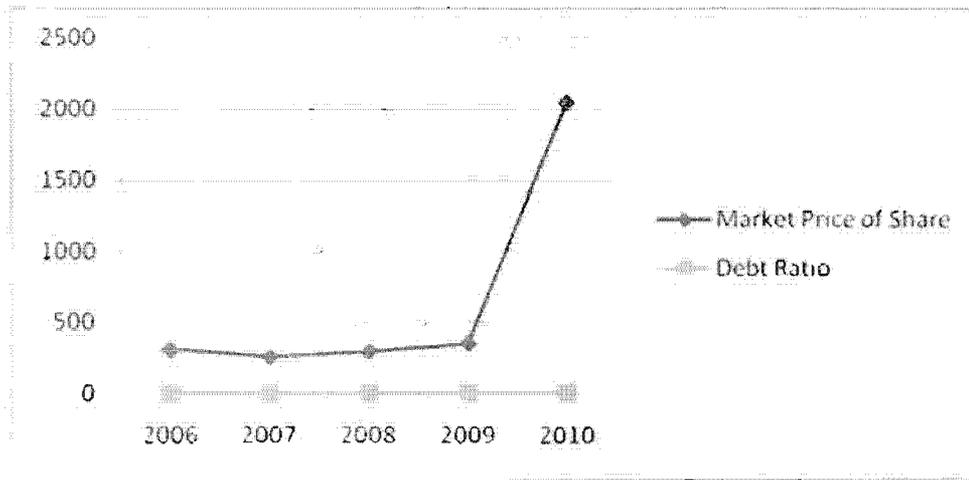


Correlation of dependent variable (Debt Ratio) with independent variable (Market Price of Share) of Singer Bangladesh Limited:

Correlation	Values	Comments
r	-0.67	There is weak negative relationship between debt ratio and market price of share
r^2	0.449	Not well fitted / No significant relationship

Aftab Automobile Limited

Year	Debt Ratio	Market Price of Share
2006	0.08	278
2007	0.09	256
2008	0.40	272
2009	0.35	288
2010	0.12	2115

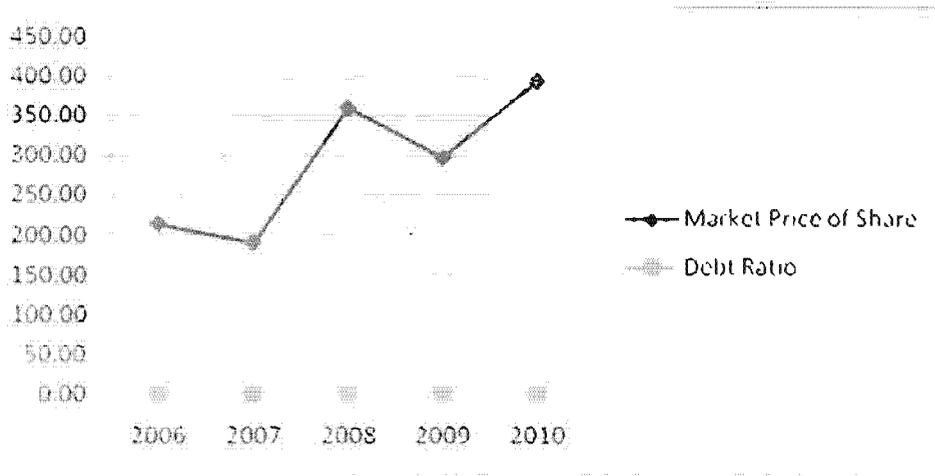


Correlation of dependent variable (Debt Ratio) with independent variable (Market Price of Share) of Aftab Automobile Limited:

Correlation	Values	Comments
r	-0.128	There is week negative relationship between debt ratio and market price of share
r^2	0.016	Not well fitted / No significant relationship

Atlas Bangladesh Limited

Year	Debt Ratio	Market Price of Share
2006	0.10	212
2007	0.10	188
2008	0.15	361
2009	0.229	298
2010	0.15	397

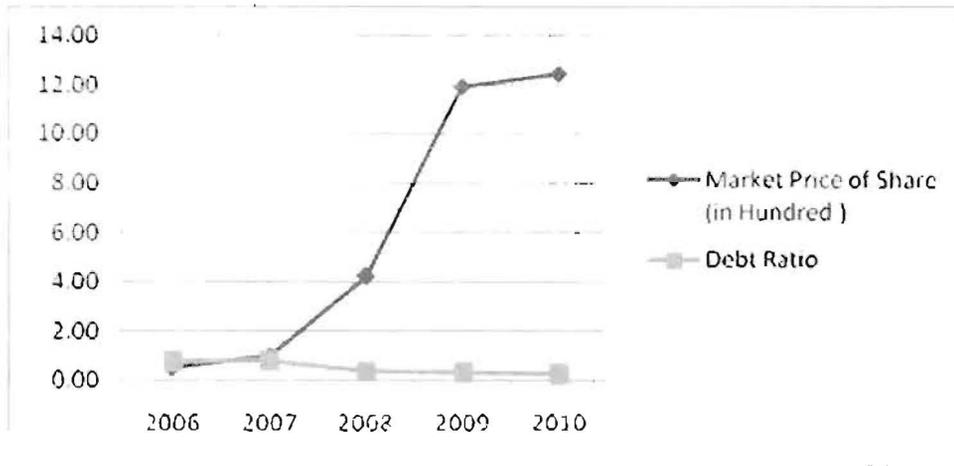


Correlation of dependent variable (Debt Ratio) with independent variable (Market Price of Share) of Atlas Bangladesh Limited:

Correlation	Values	Comments
r	0.503	There is weak positive relationship between debt ratio and market price of share
r^2	0.033	Not well fitted / No significant relationship

Bangladesh Thai Aluminium Limited

Year	Debt Ratio	Market Price of Share
2006	0.8	0.78
2007	0.79	1.2
2008	0.35	4.1
2009	0.34	11.9
2010	0.27	12.98

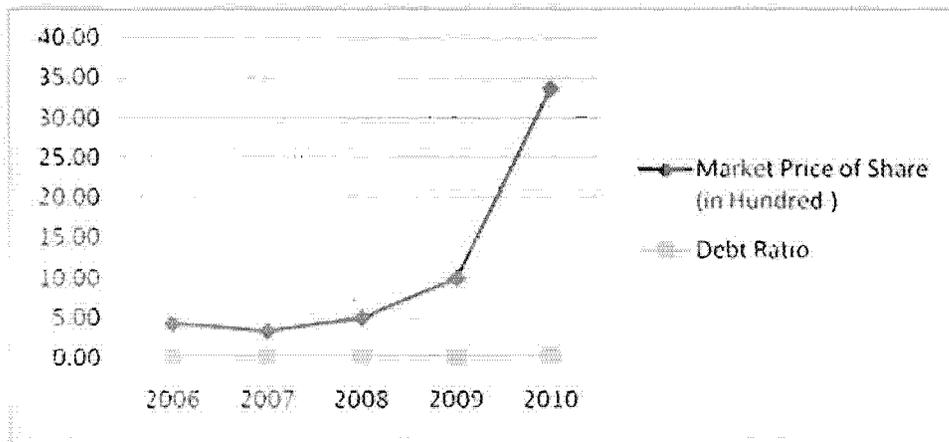


Correlation of dependent variable (Debt Ratio) with independent variable (Market Price of Share) of Bangladesh Thai Aluminium Limited:

Correlation	Values	Comments
r	-0.852	There is strong negative relationship between debt ratio and market price of share
r^2	0.726	Well fitted / Significant relationship

Monno Jute Stafflers Limited

Year	Debt Ratio	Market Price of Share
2006	0.16	4
2007	0.13	3.2
2008	0.11	5.1
2009	0.093	10
2010	0.25	38

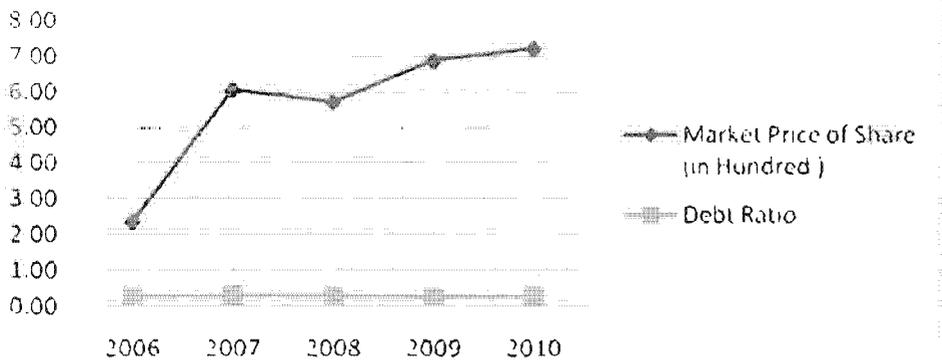


Correlation of dependent variable (Debt Ratio) with independent variable (Market Price of Share) of Monno Jute Stafflers Limited:

Correlation	Values	Comments
r	0.845	There is strong positive relationship between debt ratio and market price of share
r^2	0.715	Well fitted / Significant relationship

Eastern Cables Limited

Year	Debt Ratio	Market Price of Share
2006	0.24	2.2
2007	0.28	6.07
2008	0.26	5.59
2009	0.213	6.8
2010	0.23	7.73



Correlation of dependent variable (Debt Ratio) with independent variable (Market Price of Share) of Eastern Cables Limited:

Correlation	Values	Comments
r	-0.168	There is weak negative relationship between debt ratio and market price of share
r^2	0.028	Not well fitted / No significant relationship

Correlation of dependent variable (Debt Ratio) with independent variable (Market Price of Share) of engineering industry of Bangladesh:

Correlation	Values	Comments
r	-0.181	There is weak negative relationship between debt ratio and market price of share
r^2	0.033	Not well fitted / No significant relationship

Here, $r = -0.181$ which means Debt Ratio and Market Price of Share have weak negative relationship.

And $r^2 = 0.033$ which is less than 0.5 ($r^2 < 0.5$). We can not reject H_0 . So There is no significant relationship between Debt Ratio and Market Price of Share.

H_0 is not well fitted.

From the above it can be concluded that the relationship between debt ratio and market price of share is weakly negative but the relationship is not significant in case of engineering industries of Bangladesh.

Chapter - 6

Findings and Conclusion

The study shows that the listed companies in the engineering industry of Bangladesh are using largely different capital structure from each other. Among the six companies under analysis in recent year, Aftab Automobile Limited uses the lowest leverage (debt-equity ratio 0.11 and debt ratio 0.12) while Monno Jute Stafflers Limited uses excessive leverage (debt-equity ratio 0.49 and debt ratio 0.25) in the capital structure.

The industry average debt-equity ratio is 0.24 and debt ratio is 0.13. It implicates that the average use of debt in the industry is around 24% of equity employed and 13% of

total assets is financed by debt. The industry is capital intensive one while the long-term debt ratio of the industry is around 0.019. It indicates that the industry uses short-term fund to finance its long-term assets.

If $r^2 \geq 0.50$, there is a significant relationship between dependent variable and independent variable.

From the analysis the relationship between capital structure (debt ratio) and asset growth rate of engineering industries in Bangladesh:

Company Name	r	r^2	Relationship
Singer Bangladesh Limited	-0.09	0.008	No significant relationship
Aftab Automobile Limited	-0.621	0.385	No significant relationship
Atlas Bangladesh Limited	0.879	0.772	Significant relationship
BD Thai Aluminium Limited	-0.676	0.457	No significant relationship
Monno Jute Stafflers Limited	0.871	0.758	Significant relationship
Eastern Cables Limited	0.87	0.756	Significant relationship
Industry	0.05	0.002	No significant relationship

From the analysis the relationship between capital structure (debt ratio) and operating leverage of engineering industries in Bangladesh:

Company Name	r	r^2	Relationship
Singer Bangladesh Limited	-0.476	0.226	No significant relationship
Aftab Automobile Limited	-0.290	0.084	No significant relationship
Atlas Bangladesh Limited	0.965	0.932	Significant relationship
BD Thai Aluminium Limited	-0.944	0.891	Significant relationship

Monno Jute Stafflers Limited	0.727	0.529	Significant relationship
Eastern Cables Limited	-0.724	0.524	Significant relationship
Industry	-0.231	0.053	No significant relationship

From the analysis the relationship between capital structure (debt ratio) and financial leverage of engineering industries in Bangladesh

Company Name	r	r^2	Relationship
Singer Bangladesh Limited	0.35	0.122	No significant relationship
Aftab Automobile Limited	0.139	0.019	No significant relationship
Atlas Bangladesh Limited	-0.868	0.753	Significant relationship
BD Thai Aluminium Limited	0.833	0.695	Significant relationship
Monno Jute Stafflers Limited	0.241	0.058	No significant relationship
Eastern Cables Limited	0.686	0.471	No significant relationship
Industry	-0.062	0.004	No significant relationship

From the analysis the relationship between capital structure (debt ratio) and tangibility ratio of engineering industries in Bangladesh

Company Name	r	r^2	Relationship
Singer Bangladesh Limited	0.959	0.919	Significant relationship
Aftab Automobile Limited	-0.339	0.115	No significant relationship
Atlas Bangladesh Limited	-0.755	0.571	Significant relationship
BD Thai Aluminium Limited	-0.973	0.947	Significant relationship

Monno Jute Stafflers Limited	0.487	0.238	No significant relationship
Eastern Cables Limited	0.019	0.0001	No significant relationship
Industry	0.436	0.019	No significant relationship

From the analysis the relationship between capital structure (debt ratio) and cost of capital of engineering industries in Bangladesh

Company Name	r	r^2	Relationship
Singer Bangladesh Limited	0.952	0.906	Significant relationship
Aftab Automobile Limited	-0.338	0.115	No significant relationship
Atlas Bangladesh Limited	0.864	0.746	Significant relationship
BD Thai Aluminium Limited	-0.083	0.007	No significant relationship
Monno Jute Stafflers Limited	-0.037	0.001	No significant relationship
Eastern Cables Limited	0.40	0.16	No significant relationship
Industry	0.487	0.238	No significant relationship

From the analysis the relationship between capital structure (debt ratio) and market price of share of engineering industries in Bangladesh

Company Name	r	r^2	Relationship
Singer Bangladesh Limited	-0.67	0.449	No significant relationship
Aftab Automobile Limited	-0.128	0.016	No significant relationship
Atlas Bangladesh Limited	0.503	0.033	No significant relationship

BD Thai Aluminium Limited	-0.852	0.726	Significant relationship
Monno Jute Stafflers Limited	0.845	0.715	Significant relationship
Eastern Cables Limited	-0.168	0.028	No significant relationship
Industry	-0.181	0.033	No significant relationship

From the above analysis the relationship between capital structure (debt ratio) and some independent variables of engineering industries in Bangladesh:

Independent Variables	r	r^2	Relationship
Asset Growth Rate	0.05	0.002	Weekly Positive Relationship. The relationship is not significant.
Operating Leverage	-0.231	0.053	Weekly Negative Relationship. The Relationship is not

			significant.
Financial Leverage	-0.062	0.004	Weekly Negative Relationship. The Relationship is not significant.
Tangibility Ratio	0.436	0.019	Weekly Positive Relationship. The relationship is not significant.
Cost of capital	0.487	0.238	Weekly Positive Relationship. The relationship is not significant.
Market Price of Share	-0.181	0.033	Weekly Negative Relationship. The Relationship is not significant.

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