NOTRE DAME UNIVERSITY

OPTIMAL CAPITAL STRUCTURE AND COMPANIES' PERFORMANCE: AN EMPIRICAL STUDY ON THE FTSE 350

BY
GEORGES A. BITAR

A Thesis Submitted in partial fulfillment of the requirements
For the degree of Master in Business Administration
With Finance concentration

LOUAIZE- LEBANON
JUNE 2006

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Approved:

Dr. Hassan Hamadi
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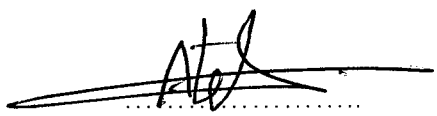
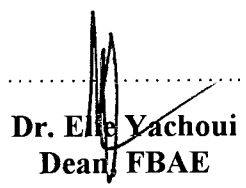


Dr. Atef Harb
First Reader



Dr. Elie Yachoui
Dean, FBAE

Notre Dame University, Louaize
Lebanon
2006

Abstract

This study examines the relationship between capital structure and financial performance in the UK market by using FTSE 350 companies. The hypothesis tested is whether there is a significant relationship between capital structure and companies' performance. The null hypothesis (H_0) stated that there is no relationship between capital structure and firms' performance.

The methodological approach taken was a sample of 129 companies from FTSE 350 compromising top UK companies. These companies were analyzed to find a relationship between the capital structure and financial performance. Data relating to the leverage and performance of these companies were downloaded from DATASTREAM. Regression tests conducted on the data were significant at 1% level.

The results found led to the rejection of the null hypothesis. This result is consistent with the Trade-off theory, Agency theory, and Signalling theory. Moreover, this result is inconsistent with Modigliani and Miller 1958, Modigliani and Miller 1963, and the Pecking Order model.

Acknowledgement

The work on this study has been an inspiring, often exciting, sometimes challenging, but always interesting experience. It has been made possible by many other people, who have supported me.

I am very grateful to my advisor Dr. Hasan Hamadi who has given me the chance to learn all theories related to capital structure. He has supported me with his encouragement and many fruitful discussions and suggestions. I would like to express my sincere thanks to my first reader Dr. Atef Harb for his invaluable experience and advice.

I would like to thank my friend and manager at work Mr. Jean-Michel Kaoukabani for his continuous support as well as for his understanding that good employees are those who have the will to learn more.

Finally, I wish to thank my parents for their endless support and encouragement.

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Chapter 1: Introduction

1.1 General Background

Any firm while expanding needs capital and that capital can come from debt or equity or a mix of both. Debt has two important advantages: (1) Interest paid is tax deductible, which lowers debt's effective cost. (2) Debtholders get a fixed return, so stockholders do not have to share their profits if the business is extremely successful. However, debt also has disadvantages. First, the higher the level of debt in the capital structure, the riskier the company, hence the higher its cost of both debt and equity. Second, if a company falls on hard times and operating income is not sufficient to cover interest charges, its stockholders will have to make up the deficit, and if they cannot, bankruptcy will result. Good times may be just around the corner, but too much debt can keep the company from getting there and thus can destroy the stockholders. Companies with volatile earnings and operating cash flows therefore limit their use of debt. On the other hand, companies with less business risk and more stable operating cash flows can take on more debt. Companies can finance with either debt or equity. Is one better than other? If so, should firms be financed either with all debt or all equity? If the best solution is some mix of debt and equity, what is the optimal mix? (Brigham 2001)

Many theories tried to find answers to the above questions. Modigliani and Miller (MM) in 1958 were the first to tackle the issues of capital structure. MM theorem states that the value of a company is unaffected by its capital structure decisions. MM implies that the capital structure of a firm is a matter of indifference and that consequently, one of the core problems of corporate finance, the problem of the optimal capital structure for a firm, is no problem at all. Another important theory attempted to answer the above questions is the Trade-off theory. Trade-off theory predicts that leverage will increase firms' performance up to a certain level since debt is risky. So, the theory states that firms trade-off the benefits of debt financing against the higher interest rates and bankruptcy costs.

Another influential theory took place is the Agency cost. Agency relationships occur when authority to make decisions is delegated to someone who is not responsible for

the consequences. At the corporate level, shareholders delegate decision-making authority to managers who may not pay the costs or reap the benefits of their decisions. Agency problem exist between creditors who want to decrease risk and stockholders who may benefit by taking on more risk. Once basic agency problems are understood, one should concentrate on methods to align the interests of managers and shareholders.

Many theories were derived from the above three main theories, mainly, the Signalling theory and the Pecking Order model. The remarkable issue in all mentioned theories on capital structure and financing decisions is the absence of any universal consensus on optimal financing structure.

The research question that arose during my literature review was: is there really a relation between capital structure and firms' performance? In order to perform this empirical research, we need to measure both capital structure and firms' performance. Firms' performance will be measured using Share Price, ROA, and Tobin's Q (Dependent variables). Share price and ROA have their limitations, so, Tobin's Q is the best measure of firms' performance since it captures both accounting and market measures. Capital structure will be measured using Gearing ratio and Debt-to-Equity ratio (Independent variables). The null hypothesis H_0 predicts that there is no relationship between capital structure and firms' performance.

During my research on capital structure, most of the empirical studies were applied on the US market. In this study, capital structure will be applied on the UK market using FTSE 350. As far to my knowledge, this will be the first study on capital structure applied to the FTSE 350. Using FTSE 350 top companies in the UK, we ensured a homogenous sample. Further, industry effect was taken into consideration, so gearing ratios of each company were divided by its industry average. Two control variables were used; the first is Logarithm of Total Sales to control firms' size and the second is stock price Volatility. We found evidence to reject H_0 since a moderate level of debt is increasing profitability ratios, mainly, Tobin's Q.

1.2 Aims and Contribution of this Study

The theory of capital structure has been dominated by the search for optimal capital structure. Optimum normally requires a trade-off between the tax advantages of borrowed money and the costs of financial distress (bankruptcy costs) when the firm finds it has borrowed too much. Debt is a cheaper source of fund than equity (issuing stocks) but debt is risky. In the real world companies do not, generally raise their debt-to-equity ratios to very high levels. This suggests that there are other important influences on capital structure besides lower costs of debt and tax relief on debt. The basic additional factors which have a bearing on the gearing level are: financial distress (bankruptcy costs), agency costs, borrowing capacity, managerial preference, pecking order, financial slack, and signalling. Understanding all these will help us to achieve a link between companies' performance and the level of debt-to-equity.

The determination of an optimal capital structure has been one of the most contentious topics in the finance literature since Modigliani and Miller (MM) introduced their capital structure irrelevancy propositions in 1958. Many theories have been developed since then, which attempt to find an optimal capital structure or an optimal ratio for the mix of debt and equity. Many interesting questions have been raised over the years: Is there really an optimal capital structure for any individual firm or industry? Does that ratio stay constant over time? Unfortunately, none has reached a target for the mix of debt and equity in the capital structure elements that are optimal for a company to perform efficiently with the maximum profit at the lowest possible risk of bankruptcy.

We are hoping in this study, through our evidence that supports the positive relationship between profitability and debt levels, to give managers guidelines for the use of debt. What should be the level of debt and what are the risks involved as well as the advantages and disadvantages of using debt.

1.3 Overview of Chapters

Chapter 2 discusses the literature review and begins with an introduction about capital structure. Then, the most influential theories about capital structure will be mentioned starting with Modigliani and Miller theorem in 1958 and then the corrected theory in 1963. Other theories as well, Miller theory in 1977, Financial Distress, Trade-off theory, Agency theory, Signalling theory, Myers & Majluf theory in 1984, and the Pecking order model. Last, the empirical studies performed on capital structure will be mentioned.

In chapter 3, the research methodology will be discussed starting with the main objective of this thesis. Then, the null (H_0) and alternative (H_1) hypotheses will be defined as well as the dependent and independent variables. Data collection is then mentioned with the definition of market and sample size. Last, an overview about the statistical package and the type of analysis used in the empirical study.

Chapter 4 discusses the findings and analysis of the variables output using SPSS. We will see a descriptive statistics of the variables and the interpretation of each variable result. Then, we will see the results of the regression analysis between each dependent and independent variables. Last, we will see the implications of the theories on our findings and which theory supports our findings and which contradicts it.

Chapter 5 will summarize the whole research, starting form the objective and purpose of the thesis, literature review of theories, data collection and definition of variables, contributions and managerial implications, the limitations of this project, and finally the recommendations.

Chapter 2: Literature Review

2.1 Introduction

The items on the right side of a firm's balance sheet: various types of debt, preferred stock, and common equity are called capital component. Any increase in total assets must be financed by an increase in one or more of these capital components. The cost of each component is called the component cost of that particular type of capital. The three components are: debt, preferred stock, and common equity. Because interest is a deductible expense, it produces tax savings that reduce the net cost of debt, making after-tax cost of debt less than the before-tax-cost.

The cost of common equity is based on the rate of return investors require on a company's common stock. Note that the new common equity is raised in two ways: first, by retaining some of the current year's earnings and second, by issuing new common stock. Equity raised by issuing stock has a somewhat higher cost than equity raised as retained earnings due to the flotation costs involved with new stock issues.

The reason we must assign a cost of capital to retained earnings involves the opportunity cost principle. The firm's after-tax earnings belong to its stockholders. Bondholders are compensated by interest payments and preferred stockholders by preferred dividends. All earnings remaining after interest and preferred dividends belong to the common stockholders, and these earnings serve to compensate stockholders for the use of their capital. Management may either pay out earnings in the form of dividends or retain earnings and reinvest them in the business. If management decides to retain earnings, there is an opportunity cost involved: stockholders could have received the earnings as dividends and invested this money in other stocks, in bonds, in real estate, or anything else.

Each firm try to obtain an optimal capital structure, defined as that mix of debt, preferred, and common equity, which causes its stock price to be maximized. Therefore, a value-maximizing firm will determine its optimal capital structure, use it as a target, and then raise new capital in a manner designed to keep the actual capital structure on

target over time. Capital structures vary considerably across industries. For example, pharmaceutical companies generally have very different capital structures than airline companies. Moreover, capital structures vary among firms within a given industry. What factors can explain these differences? In an attempt to answer this question, academics and practitioners developed a number of theories, and the theories have been subject to empirical tests. (Brigham and Houston 2001)

The scope of this chapter is to present the theories about capital structure which starts with Modigliani and Miller theorem. The determination of an optimal capital structure has been one of the most contentious topics in the finance literature since Modigliani and Miller (MM) in 1958 which specifies conditions under which various corporate financing decisions are irrelevant. Five years later, Modigliani and Miller made another paper whereby they argued that introducing taxes into the model created tax shield benefits to debt; however, this will increase bankruptcy costs. So, there should be a trade-off between risk and debt. Section three introduces the Miller theory of debt and taxes in 1977. Miller showed that the corporate tax advantage of interest deductibility was partially offset by the personal tax advantage of interest payments which is consistent with the Modigliani and Miller theorem in 1958.

In section four, the Financial Distress will be mentioned; financial distress occurs when the firm is unable to meet part of its financial obligations. In section five, the Trade-Off theory between bankruptcy risk and debt advantage will be discussed. In section six, the agency theory and its impact on capital structure and firm performance will be discussed. Agency problems arise between shareholders, managers, and debtholders. In section seven, the signalling approach will be discussed, mainly with Ross theory (1977). Ross's theory showed that, under asymmetry information, two firms with different returns and capital structure, each tends to give signal to the market of their financing decisions and none would be interested in giving a wrong signal. Section eight presents Myers and Majluf (1984) theory of corporate financing and investment decisions when firms have information that investors do not have. Section nine presents the pecking order model, which predicts that external debt financing driven by the internal financial deficit, has much greater explanatory power than a static trade-off model which predicts that each firm adjusts toward an optimal debt ratio. Section ten mentions some empirical studies performed on the capital structure. Section eleven, will

conclude all these theories and will raise the problem that I will be testing in this project.

2.2 Modigliani-Miller Theorem (MM)

One of the most influential articles that still have echoes till today is written by Franco Modigliani and Merton H. Miller in the American Economic Review in 1958, "The Cost of Capital, Corporation Finance, and the Theory of Investment". The MM theorem is still widely discussed and argued among economists and corporate finance types. In this section, the Modigliani and Miller theory 1958 will be presented with its three propositions that state that the value of a company is unaffected by its capital structure decisions. Then, the theory in 1963 will be presented whereby MM argued that introducing corporate taxes into the model creates tax shield benefits to debt. The last part of this section will be about critics on, and arguments favoring, the MM theory.

2.2.1 Proposition I

MM propositions earned provide a good start in understanding capital structure decisions. MM Proposition I which stated that in equilibrium and given perfect capital markets without taxes, the value of a firm was independent of its choice of capital structure. Their elegant arbitrage argument revolved around two companies identical in every aspect except for financing mix and market value. Equity holders of the higher-valued, leveraged firm would want to sell their shares; then, using the proceeds plus homemade leverage equivalent to the debt mix of the leveraged firm, they could buy shares of the lower-valued, all-equity firm. Investors would continue in a similar fashion until the companies had exactly the same market value. These transaction sets of buying and selling would generate riskless profits until equilibrium was established. Thus, MM concluded that capital structure has no impact on the Value of the firm. This represented a radical departure from the conventional wisdom on optimal financing decisions as espoused by Schwartz (1959), among others. The resulting controversy motivated many researchers to compare and contrast these different views; a comprehensive attempt can be found in Robicheck and Myers (1965). (Ryen et al 1997)

The famous Modigliani and Miller proposition I on the capital structure is as follows:

> "*The market value of any firm is independent of its capital structure and is given by capitalizing its expected return at the rate appropriate to its risk class. This proposition can be added in an equivalent way in terms of the firm's average cost of capital which is the ratio of its expected return to the market value of all its securities.*"

Proposition I assert that in equilibrium the following is true:

$$V_j = (S_j + D_j) = \overline{X}_j / p_k, \text{ for any firm j in class k.} \quad (1)$$

Where $\overline{X}_j$ is the expected return on the assets owned by the company, p_k is the capitalization rate of any share in the k^{th} class, D_j is the market value of the debts of the company, S_j is the market value of its common shares, and $V_j = S_j + D_j$ is the market value of all its securities or, the market value of the firm. (Modigliani and Miller 1958)

Equation (1) means that the average cost of capital to any firm is completely independent of its capital structure and is equal to the capitalization rate of a pure equity stream of its class. Consider two firms in the same class and assume for that the expected return, $\overline{X}$, is the same for both firms. Assume company 1 is financed entirely with common stock while company 2 has some debt in its capital structure. Suppose first the value of the levered firm, V_2, to be larger than that of the unlevered one, V_1. However, levered companies cannot command a premium over unlevered companies because investors have the opportunity of putting the equivalent leverage into their portfolio directly by borrowing on personal account. Since arbitrage will also prevent V_2 from being larger than V_1, we can conclude that in equilibrium we must have $V_2=V_1$ as stated in Proposition I:

$$\text{Value of Levered Firm} = \text{Value of Unlevered Firm}$$

$$V_L = V_U \quad (2)$$

Equation (2) means that in a world without taxes, any investor of the unlevered firm can borrow money at the same interest as the levered firm and make money by investing in the unlevered company. Therefore, the value of the two companies will be the same (Copeland and Weston 1992).

According to Brigham and Houston (2001), Modigliani and Miller (1958) study was based on some unrealistic assumptions, including the following:

1. There are no brokerage costs
2. There are no taxes
3. There are no bankruptcy costs
4. Investors can borrow at the same rate as corporations
5. All investors have the same information as management about the firm's future investment opportunities
6. EBIT is not affected by the use of debt

Despite the fact that many of these assumptions are far from the reality of capital markets, relaxing them does not always lead to violation of the MM theory. It is difficult to find a case where the firm's value might plausibly depend on financing. The most serious violations of MM's proposition I create a moneymaking opportunity for firms and financial intermediaries. Any distortion of the normal function of capital markets creates unsatisfied investors that can become the clientele for new more attractive securities. Once the clientele is satisfied, proposition I is restored, until the next distortion (Brealey and Myers 1991).

2.2.2 Proposition II

From proposition I, Modigliani and Miller derived proposition II concerning the rate of return on common stock in companies whose capital structure includes some debt. The expected rate of return on equity is a linear function of the debt-equity ratio. Proposition II is as follows:

"The expected yield of a share of stock is equal to the appropriate capitalization rate p_k for a pure equity stream in the same risk class, plus a premium related to financial risk equal to the debt to equity times the spread between p_k and r (interest rate on debt)." (Modigliani and Miller 1958)

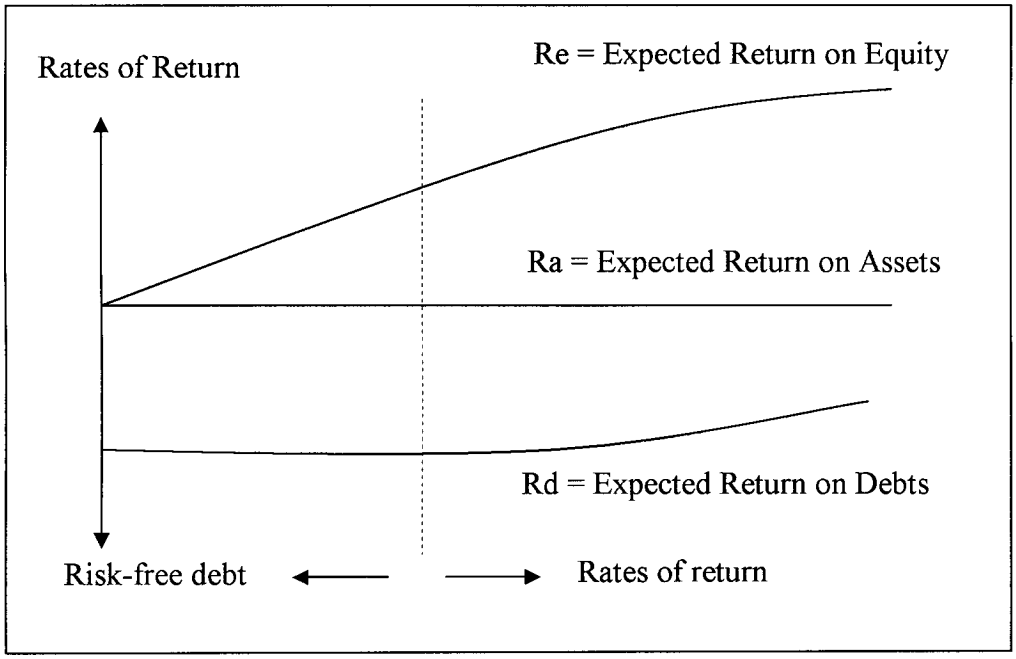


Figure 2.1: MM's Propostion II
(Brealey and Myers 2000)

It is clear from figure 2.1 that, as the debt-equity ratio increases, the expected return on equity increases as long as the debt is risk-free. However, if leverage increases the risk of the debt, the demand for a higher return will cause the increase in return on equity to slow down (Brealey and Myers 2000). According to Dickerson et al (1995), MM shows that the use of cheap debt gives shareholders a higher rate of return, but this higher return is precisely what they need to compensate for the increased risk from financial leverage.

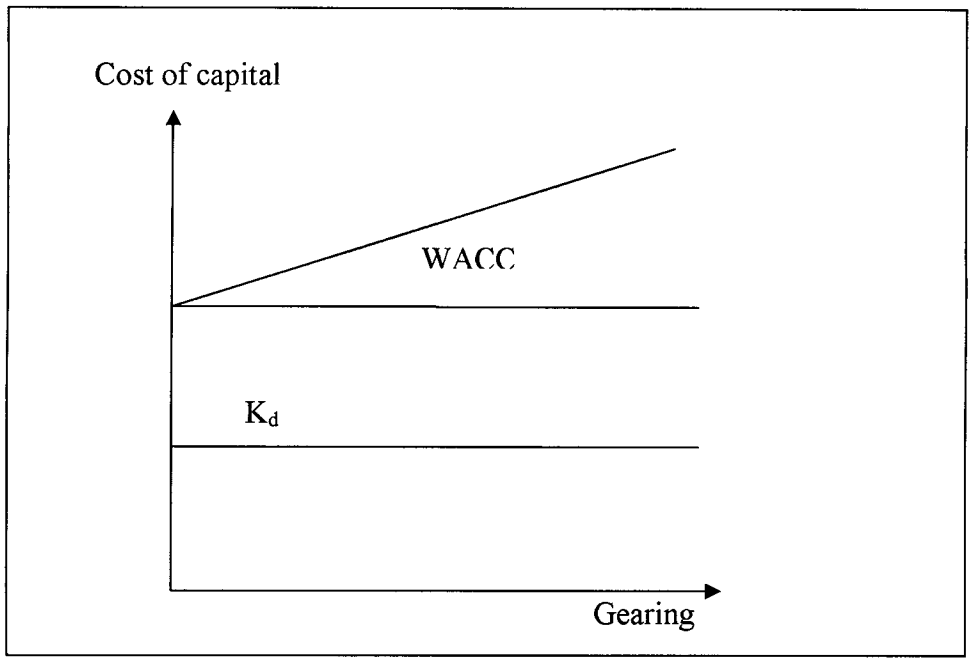


Figure 2.2: Graphical Illustration of MM theorem 1958
(Garvey 1992)

From figure 2.2, according to Garvey (1992), the cost of equity increases to exactly compensate for the cheap debt in the capital structure. Note that K_e and K_d do not increase at high gearing to allow for bankruptcy risk, because this risk is ignored.

2.2.3 Proposition III

On the basis of the previous propositions with respect to cost of capital and financial structure, Modigliani and Miller derived proposition III for optimal investment policy by the firm. Proposition III is as follows:

> "*If a firm in a risk class K is acting in the best interest of the stockholders at the time of the decision, it will exploit an investment opportunity if and only if the rate of return on the investment,* p^*, *is as large as or larger than the* capitalization rate of any share in the k^{th} class, p_k, *and will be completely unaffected by the type of security used to finance the investment*". (Modigliani and Miller 1958)

To establish this result, the three major financing alternatives are considered to be open to the firm; bonds, retained earnings, and common stock issues, and Modigliani & Miller showed that in each case an investment is worth undertaking if, and only if, $p^* \geq p_k$.

Proposition III seems to imply that the capital structure of a firm is a matter of indifference; and that, consequently, one of the core problems of corporate finance, the problem of the optimal capital structure for a firm, is no problem at all. Misinterpretation of the scope of Proposition III can be avoided by remembering that this Proposition tells only that the type of instrument used to finance an investment is irrelevant to the question of whether or not the investment is worth while. This does not mean that the owners (or managers) have no grounds whatever for preferring one financing plan to another; or that there are no other policy or technical issues in finance at the level of the firm. Another reason why the alternatives in financial plans may not be a matter of indifference arises from the fact that managers are concerned with more than simply furthering the interest of the owners. Such other objectives of the management, which need not be necessarily in conflict with those of the owners, are much more likely to be served by some types of financing arrangements than others. This issue raised the Agency theory which will be discussed in details in later section. (Modigliani 1958)

2.2.4 The Modigliani and Miller theory: 1963

Later, in 1963, Modigliani and Miller wrote a follow-up article of their previous 1958 theorem whereby they relaxed the assumption that there are no corporate taxes. In their discussion of the effects of the present method of taxing corporations on the valuation of firms, they argued that:

> "The deduction of interest in computing taxable corporate profits will prevent the arbitrage process from making the value of all firms in a given class proportional to the expected returns generated by their physical assets.

> Instead, it can be shown *the market values of firms in each class must be proportional in equilibrium to their expected returns net of taxes".*

Modigliani and Miller argued that, unfortunately, the statement in italics is wrong. Even though one firm may have an expected return after taxes twice that of another firm in the same risk-equivalent class, it will not be the case that the actual return after taxes of the first firm will always be twice that of the second, if the two firms have different degrees of leverage. And since the distribution of returns after taxes of the two firms will not be proportional, there can be no arbitrage process which forces their values to be proportional to their expected after-tax returns. In fact, it will be shown that arbitrage will make values within any class a function not only of expected after-tax returns, but of the tax rate and the degree of leverage. This means that the tax advantages of debt financing are somewhat greater than the originally suggested. Thus, if the tax rate is other than zero, the actual return after taxes will depend not only on the scale of the stream, but also on the tax rate and the degree of leverage. (Modigliani and Miller 1963)

Value of Levered Firm = Value of Unlevered Firm + Value of Tax Savings (3)

Equation (3) shows that a significant positive relationship between market values of firms and their debt tax shield exists and it emphasizes the importance of leverage decision to firm value.

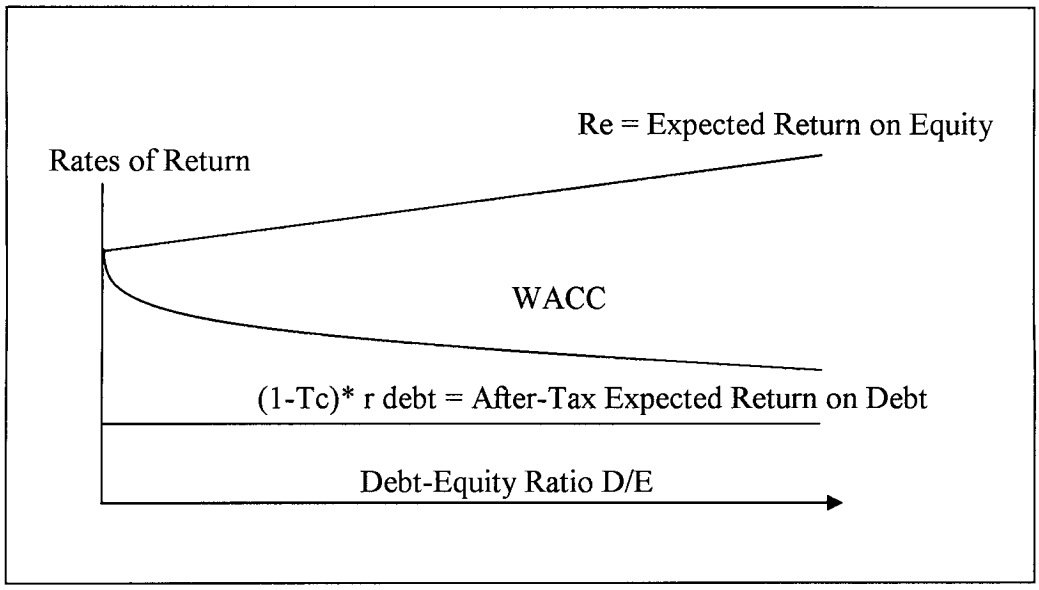


Figure 2.3: MM's Proposition II with Corporate Taxes (Brealey et al 1999)

No investment can meaningfully be regarded as 100 per cent equity financed if the firm makes any use of debt capital- and most firms do, not only for the tax savings, but, for many other reasons having nothing to do with cost in the present static sense. And no investment can meaningfully be regarded as 100 per cent debt financed when lenders impose strict limitations on the maximum amount a firm can borrow relative to its equity. Since the firm's long-run capital structure will thus contain both, debt and equity capital, investment planning must recognize that, over the long pull, all of the firm's assets are really financed by a mixture of debt and equity capital even though only one kind of capital may be raised in any particular year. That is, the appropriate cost of capital for investment decisions over time is a weighted average of the costs of debt and equity financing (Figure 2.3), the weights being the proportions of each in the target capital structure. (Modigliani and Miller 1963)

In general, one can say that the force of these corrections has been to increase somewhat the estimate of the tax advantages of debt financing under MM model. The existence of a tax advantage for debt financing does not necessarily mean that corporations should at all times seek to use the maximum possible amount of debt in their capital structures. For one thing, other forms of financing, notably retained earnings, may in some circumstances be cheaper. More important, there are limitations

imposed by lenders. These additional considerations imply the maintenance by the corporation of a substantial reserve of untapped borrowing power. The tax advantage of debt may well tend to lower the optimal size of that reserve, but it is hard to believe that advantages of the size contemplated under MM model could justify any substantial reduction. Nor do the data indicate that there has in fact been a substantial increase in the use of debt by the corporate sector during the recent high tax years. (Modigliani and Miller 1963)

2.2.5 Empirical Research on the MM theorem

Several articles and papers have followed the MM theorem. Some were in favor of the Modigliani & Miller arguments and others were against with many critics. In this section we will see some of these arguments and critics.

Sheridan Titman (2002) wrote: "*As we all know, the first step in understanding corporate finance theory is the Modigliani and Miller (1958) theorem, which specifies conditions under which various corporate financing decisions are irrelevant. When the theorem was first stated, most of us thought of it as a proposition about a firm's debt-equity mix. However, applications of the theorem have since been expanded to discussions of debt maturity, risk management, and even mergers and spin-offs, which, according to the logic of MM, neither create, nor destroy value in the absence of positive or negative synergies. By clearly stating the conditions under which these decisions have no relevance, the theorem provides a basis for examining how these choices can create and destroy value for a corporation*".

Mark Rubinstein wrote a paper that was totally against MM theorem. He believes that John Burr William's book "The Theory of Investment Value" (1938) contains what is probably the first exposition of the Modigliani-Miller proposition on the irrelevancy of capital structure, which Williams poetically calls "the Law of the Conservation of Investment Value." Modigliani and Miller prove William's Law using a number of assumptions that their own later work and the work of several others show to be unnecessary. In both their 1958 and their streamlined 1969 proofs, Modigliani and Miller require riskless debt. On the other hand, it is equally immediately clear from

Williams "proof" that risky debt (provided there are no bankruptcy costs) does not alter his Law. But what both MM initially and Williams failed to notice, and only became clear later in Joseph E. Stiglitz (1969, 1974), is that if risky debt is created as the capital structure is shifted more toward debt, in an incomplete market, a fundamentally new security can be created or old security destroyed and this may alter state prices which will in turn change the discount rates used to determine the present value of the sum of the cash flows to debt and equity. Another confusing issue in the original MM paper, according to Rubinstein, is the difference between the irrelevancy of capital structure for (1) firm value and for (2) the stock price. MM assert at the outset that they want to prove the latter, but only end up proving the former. It is easy to see how even if (1) is true, (2) need not be. Rubinstein concludes: "*It has become commonplace to view the Modigliani-Miller Theorem not as a realistic proof that capital structure is irrelevant, but rather as a way of obtaining the list of reasons that make it relevant. I have argued that the Great Moment in the history of the Modigliani-Miller Theorem ironically belongs to the publication of John Burr Williams' 1938 book, The Theory of Investment Value. Not only did MM not invent the Modigliani-Miller Theorem, MM did not even invent arbitrage reasoning or proof, as it is sometime claimed*".

Another article written by Glen Ryen in 1997 were criticizing the MM theorem: "*What MM did not discuss in that article were the practical applications of this theory for individual firms or how well the theory explained observed facts, such as corporate leverage ratios and market reactions to security issues*". Also, according to Ryen, what MM did not mention is the relation of business risk and cash flows. The greater the fluctuations in a company's cash flows, the greater the chance it will be unable to meet its obligations in any given period. Firms with steadier cash flow will be able to support higher debt levels than riskier firms. An important point to note is that shareholders bear the costs of adjusting the firm's level of risk every time risky debt is issued. This is so because the market demands a premium to buy the bonds of risky firms; on average, that premium covers expected bankruptcy costs. Research from Taggart (1977), Jalilvand and Harris (1984), and others suggest that managers do pursue a target debt ratio. Campbell (1988) showed that market reactions to leverage-altering transactions, such as convertible bond calls and equity-for-debt swaps, were related to whether the transaction moved the firm closer to or farther away from industry norms. Cordes and Sheffrin (1983) pointed out that such non-debt tax shields as net operating loss

deductions, foreign tax credits, investment tax credits, and the add-on minimum tax on preference items (such as accelerated depreciation and amortization) may eliminate the need for debt-generated tax shields. Insufficient taxable income (along with limits on carrybacks; and carryforwards) may also reduce the value of interest deductions to a firm. Cordes and Sheffrin were led to conclude that the after-tax cost of debt varies widely across industries. This in turn could help explain the variation in capital structure from industry to industry.

A key assumption inherent to the validity of MM Proposition I is the homogeneity of expectations introduced by Myers and Majluf (1984). This means that all market participants (managers as well as other stakeholders) are assumed to have equal information about the future states of nature, and to interpret them the same way. Also, Ross (1977) with his signalling approach was consistent with the Modigliani and Miller theory. Ross showed that two firms with different returns and capital structure, each tends to give signal to the market of their financing decisions and none would be interested in giving a wrong signal. So the capital structure would be irrelevant for the determination of the firm value. Also, in 1977, Miller wrote an article that was consistent with the Modigliani and Miller's corrected article, as we will see in the coming section. He showed that one factor that could help explain the relately low observed levels of debt was the differential treatment of equity and debt income on the personal level. The corporate tax advantage of interest deductibility was partially offset by the personal tax disadvantage of interest payments.

2.3 The Miller (1977) Theory

In this section we will see a new and fashionable version of the optimal capital structure that Miller proposes to challenge. Miller argues:

> "*Even in a world in which interest payments are fully deductible in computing corporate income taxes, the value of the firm, in equilibrium will still be independent of its capital structure*".

The views about debt and taxes have evolved over the last years in the course of countless discussions with several colleagues of Miller mainly, Fisher Black, Robert Hamada, Roger Ibbotson, Myron Scholes, and Eugene Fama. In their first paper twenty years ago, MM were able to prove that when the full range of opportunities available to firms and investors, the following simple principle would apply: "in equilibrium, the market value of any firm must be independent of its capital structure". However, the invariance proposition was derived for a world with no taxes, and that world, is not ours. In our world, the value of the firm can be increased by the use of debt since interest payments can be deducted from taxable corporate income. But, the stockholders must incur increasing risks of bankruptcy and they conclude that the balancing of these bankruptcy costs against the tax gains of debt finance gives rise to an optimal capital structure.

Bankruptcy costs and agency costs do indeed exist as noted in the original MM 1958 article. It is just that these costs seem disproportionately small relative to the tax savings they are supposedly balancing. The tax savings are conventionally taken as being on the order of 50 cents for each dollar of permanent debt issued. The figure one usually hears as an estimate of bankruptcy costs is 20 percent of the value of the estate. The only study that deals with the costs of bankruptcy is that of Jerold Warner. Warner tabulated the direct costs of bankruptcy for a sample of 11 railroads that filed petitions in bankruptcy between 1930 and 1955. Warner finds that the direct costs of bankruptcy averaged only about 1 percent of the value of the firm 7 years before the petition was filed. For big businesses, at least (particularly for low-levered ones as IBM or Kodak), the supposed trade-off between tax gains and bankruptcy costs looks suspiciously like the recipe for the fabled horse-and-rabbit stew- one horse and one rabbit. (Miller 1977)

Problems arise also on the other side of the trade-off. If the optimal capital structure were simply a matter of balancing tax advantages against bankruptcy costs, why have observed capital structures shown so little change over time? The debt/ asset ratio of the typical non-financial corporation in the 1950's was little different from that of the 1920's despite the fact that tax rates increased from 10 percent in the 1920's to 52 percent in the 1950's. Such rise seemed to be mainly a substitution of debt for preferred stock, rather than of debt for common stock.

Miller (1977) modified the MM theory by introducing both corporate and personal taxes. Accordingly, the gearing from debt is as follows:

$$G_L = [1 - (1 - T_C)(1 - T_{PS})/(1 - T_{PB})] B_L \quad (4)$$

Where:

G_L is the tax advantage of gearing,

T_C is the corporate tax rate,

T_{PS} is the personal income tax rate applicable to income from common stock,

T_{PB} is the personal income tax rate applicable to income from bonds and

B_L is the market value of the levered firm's debt

Note that when all tax rates are set equal to zero, equation (4) does indeed reduce to the standard MM no-tax result of $G_L = 0$. And when the personal income tax rate on income from bonds is the same as that on income from shares- a special case of which is when there is assumed to be no personal income tax at all- then the gain from leverage is the familiar $T_C B_L$. Any situation in which the owners of corporations could increase their wealth by substituting debt for equity (or vice versa) would be incompatible with market equilibrium. Their attempts to exploit these opportunities would lead, in a world with progressive income taxes, to changes in the yields on stocks and bonds and in their ownership patterns. These changes, in turn, restore the equilibrium and remove the incentives to issue more debt, even without invoking bankruptcy costs or lending costs. (Miller 1977)

As companies begin to borrow, managers must persuade investors to hold bonds instead of stocks. The bigger the tax bracket of the investor is, the bigger the rate of interest payments that the firm must give in order to attract the particular investor. Companies can afford to bribe investors as long as the personal tax rate is smaller than the corporate tax rate. Migration of investors from equity-holders to bondholders stops when the corporate tax savings are equal to the personal tax loss. Consequently, the debt to equity ratio of a company depends on the corporate tax rate and the funds available to investors in the various tax brackets (Brealey and Myers 1991)

De Angelo and Masulis (1980) analyzed Miller's personal tax theory and introduced the accounting depreciation and investment tax credits, where they stated that these non-debt corporate tax shields were sufficient to overturn the leverage irrelevancy theory. They remarked that these would lead to a market equilibrium, in which each firm has a unique interior optimum leverage decision solely due to the interaction of personal and corporate tax treatments of debt and equity.

2.4 Financial Distress

The Modigliani and Miller theory (1958) of capital structure mentions that the product market decisions of firms are separate from financial market decisions. Basically, this is achieved by assuming there is perfect competition in product markets. In an oligopolistic industry where there are strategic interactions between firms in the product market, financial decisions are also likely to play an important role. Financial distress is simply defined as the firm's inability to meet part or all of its financial obligations, a situation that may or may not lead to bankruptcy. Also, the firm is exposed to certain costs, direct or indirect, as shown in Table 2.1 below, when it faces financial distress.

Direct costs include expenses related to courts, lawyer, accountants, consultants, and experts in addition to administrative expenses in case of bankruptcy proceedings. On the other hand, indirect costs are expenses or economic losses that result from bankruptcy but are not cash expenses spent on the process itself. Examples of indirect costs are the diversion of management's time while bankruptcy is underway, lost sales during and after bankruptcy, and loss of key employees. (Megginson 1997)

Table 2.1: Costs of Financial Distress

Costs of financial distress

Indirect examples	Direct examples
❖ Uncertainties in customers' minds about dealing with this firm – lost sales, lost profits, lost goodwill.	❖ Lawyers' fees
❖ Uncertainties in suppliers' minds about dealing with this firm – lost inputs, more expensive trading terms.	❖ Accountants' fees
❖ If assets have to be sold quickly the price may be very low.	❖ Court fees
❖ Delays, legal impositions, and tangles of financial reorganization may place restrictions on management action, interfering with the efficient running of the business	❖ Management time
❖ Management may give excessive emphasis to short-term liquidity, e.g. cut R&D and training, reduce trade credit and stock levels.	
❖ Temptation to sell healthy businesses as this will raise the most cash.	
❖ Loss of staff morale, tendency to examine alternative employment.	
❖ To conserve cash, lower credit terms are offered to customers, which impacts on the marketing effort.	

Financial distress increases as debt financing increases, while the benefits of the debt tax shield increases as the use of debt financing increases; the former decreases the firm's market value whereas the later increases it. Baxter (1967), Kraus and Litzenberger (1973), Scott (1976) and Kim (1978) showed that the firm should trade off the tax advantage from debt financing against the risk of bankruptcy, and that an optimal capital structure would maximize the firm's total market value.

Firms, whose earnings are more volatile, face a greater chance of bankruptcy and therefore, should use less debt than more stable firms. This is consistent with the point mentioned before, that firms with high operating leverage, and thus greater business risk, should limit their use of financial leverage. For this, firms that would face high costs in the event of financial distress should rely less heavily on debt. For example,

firms whose assets are illiquid and thus would have to be sold at "fire sale" prices should limit their use of debt financing. (Brigham and Houston 2001)

Brander and Lewis (1986) and Maksimovic (1986) analyze the role of debt as pre-commitment device in oligopoly models. By taking on a large amount of debt a firm effectively pre-commits to a higher level of output. Titman (1984) and Maksimovic and Titman (1993) have considered the interaction between financial decisions and customers' decisions. Titman (1984) looks at the effect of an increased probability of bankruptcy on product price because of, for example, the difficulties in obtaining spare parts and servicing should the firm cease to exist. Makismovic and Titman (1993) consider the relationship between capital structure and a firm's reputation incentives to maintain high product quality.

2.5 The Trade-Off Theory

The above arguments led to the development of what is called "the Trade-Off theory of leverage", in which firms trade off the benefits of debt financing against the higher interest rates and bankruptcy costs. Many pioneers in the finance field wrote about the Trade-Off theory of capital structure like Kraus and Litzenberger (1973), Scott (1977), Taggart (1977), Haugen and Senbet (1978), Marsh (1982), Kane et al (1984) and Bradley et al (1984). A summary of the trade-off theory is expressed graphically in figure 2.4 below:

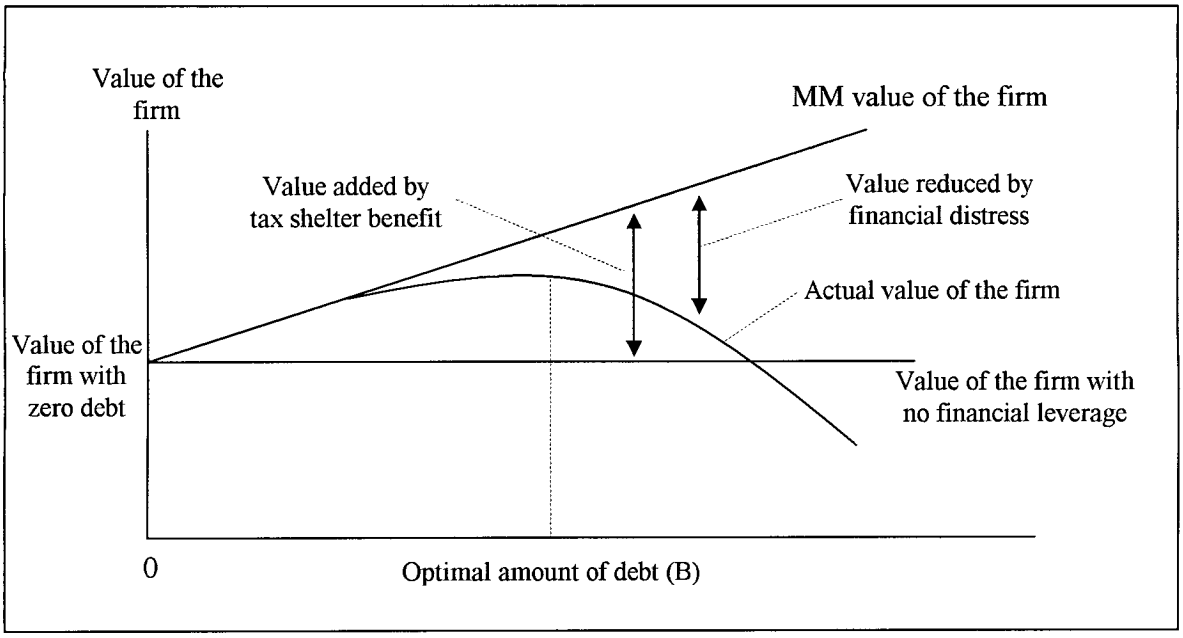


Figure 2.4: Effect of Leverage on the Value of Firm's Stock
(Brigham and Houston 2001)

From figure 2.4 we can realize that the diagonal line represents the value of the firm in a world without bankruptcy costs. The curved shape represents the value of the firm with these costs. The curved shape rises as the firm moves from all equity to a small amount of debt. Here, the expected present value of the distress costs is minimal because the probability of distress is small. However, as more debt is incurred, the present value of these costs rises at an increasing rate. At some point, the rise in the present value of these costs from an additional dollar of debt equals the rise in the present value of tax shield. This is the debt level maximizing the value of the firm and is represented by (B) in the figure 2.4. In other words, (B) is the optimal amount of debt. Bankruptcy costs increase faster than the tax shield beyond this point, implying a reduction in firm value from further leverage. As a result, the following is true:

Value of Levered Firm = Value of Unlevered Firm + Value of Tax Savings
– Present Value of Expected Costs of Financial Distress
(Brealey and Myers 2000)

The Trade-Off theory of capital structure does not provide a satisfactory explanation of actual practice, because the empirical magnitudes of bankruptcy costs and interest tax shields do not match observed capital structures (Bernanek et al 1995). Ross et al (1993) mentioned that in Trade-Off theory, no formula exists at this time to exactly

determine the optimal debt level for a particular firm. This is because bankruptcy costs cannot be expressed in a precise way.

2.6 Agency Theory

2.6.1 Introduction

Agency theory is the analysis of the conflict that arises between corporate managers and shareholders. Corporate managers are the agents of shareholders, a relationship loaded with conflicting interests. The payout of cash to shareholders creates major conflicts that have received little attention. Payouts to shareholders reduce the resources under managers' control, thereby reducing managers' power, and making it more likely they will incur the monitoring of the capital markets which occurs when the firm must obtain new capital. Financing projects internally avoids this monitoring and the possibility the funds will be unavailable or available only at high explicit prices. Managers have incentives to cause their firms to grow beyond the optimal size. Growth increases managers' power by increasing the resources under their control. It is also associated with increases in managers' compensation, since compensation is positively related to the growth in sales. (Jensen 1986)

The main issues that agency theory tries to address are:

1. To study the influence of the sharing rule in itself through a detailed analysis of agent's actions if a certain capital structure is assumed and if the firm has already have the financing
2. To devise a certain kind of framework, this will help to identify the ultimate bearers of the losses resulting from the agency problems.
3. To advise different instruments, this can be used to tackle these agency problems in different scenarios that might arise.

This section is divided into four parts. In the first parts, the agency costs of external equity will be discussed, second part mentions the agency cost of debt, and third part discusses the agency theory of free cash flow developed by Jensen (1986). In last part, summaries of additional theories on the agency costs will be mentioned.

2.6.2 Agency Cost of External Equity

Jensen and Meckling (1976) developed the agency cost theory of financial structure which concluded that when an entrepreneur owns 100% of the stock of a company there is no separation between corporate ownership and control. Accordingly, the entrepreneur bears all of the costs and reaps all of the benefits of his actions. Once a fraction, α, of the firm's stock is sold to outside investors, the entrepreneur bears only $1 - \alpha$ of the consequences of his actions. However, the entrepreneur is charged in advance for the perk he is expected to consume after the equity sale, so the entrepreneur once again bears the full costs of his or her actions. Also, the society suffers because these agency costs of equity reduce the market value of corporate assets by $(1 - \alpha)$ times the expected value of entrepreneurial perk consumption.

The agency conflict derived from the fact mentioned above is not the only or the most important conflict. It is likely that the most important conflict arises from the fact that as the manager's ownership falls, his attempt to devote significant effort to creative activities such as searching out new profitable projects falls. In fact, he may avoid such projects simply because it requires too much trouble or effort on his part to learn about them. Avoiding these personal costs and the anxieties that go with them represent a source of on-job utility to him, and this can result in the value of the firm being substantially lower than it otherwise could be.

Jensen and Meckling point out that using debt finance can help overcome the agency problem costs of external equity in two ways. First, using debt by definition means that less external equity will have to be sold to raise a given dollar amount of external financing. Second, an important effect of employing outside debt rather than equity financing is that this reduces the scope for excessive managerial perquisite consumption. The burden of having to make regular, contractually enforceable debt service payments serves as a very effective tool for disciplining entrepreneurs.

Jensen and Meckling raised the question "Why don't we observe large corporation individually owned with a tiny fraction of the capital supplied by the entrepreneur in return for 100% of the equity and the rest simply borrowed?" The reasons they gave for this are:

1. The incentive effects associated with highly geared firms
2. The monitoring costs these incentives effects lead to
3. Bankruptcy costs

All these costs are simply particular aspects of the agency costs associated with the existence of debt claims on the firm. This argument has led to another agency problem which is the agency cost of debt that will be discussed in the coming section.

2.6.3 Agency Cost of Debt

In addition to the agency cost of external equity, Jensen and Meckling (1976) pointed out another problem in corporations, which is the agency problem between equity-holders, managers and bondholders. As the fraction of debt in a firm's capital structure increases, bondholders begin taking on an increasing fraction of the firm's business and operating risk, but shareholders and managers still control the firm's investment and operating decision. This gives managers a variety of incentives to expropriate bondholder wealth for the benefit of themselves and the shareholders they represent. A simple example would be to float a bond issue, and then pay out the money raised to shareholders as a dividend.

Another way the shareholders can separate bondholders from their wealth is to borrow money on the promise that it will be used to finance a safe investment and then actually invest in a risky project. If these investments are successful, shareholders can fully repay bondholders and pocket any excess project returns. If the project is unsuccessful, shareholders simply default and bondholders take over an empty corporate shell. According to Megginson (1997), an effective preventive steps that bondholders can take, involve writing very detailed covenants into bond contracts, which constrain the ability of the borrowing firm's managers to engage in appropriate behavior.

A second problem according to Myers (1977) that arises from the conflict between shareholders and bondholders is the "Moral Hazard". If the firm were totally equity funded, shareholders would accept all positive NPV projects. However, when partially funded with debt, the shareholders may have an incentive to reject some positive NPV

investment. Myers argues that when a firm's assets are largely made up of growth opportunities it would be difficult to fund the firm with debt because of the shareholders' incentive to under-invest. If there is a large amount of debt outstanding which is not backed by cash flows from the firm's assets, equity-holders may be reluctant to take on safe, profitable projects because the bondholders will claim the lions' share of the cash flow.

A third problem mentioned by Stiglitz and Weiss (1981) that arises from the conflict between shareholders and bondholders is the "Adverse Selection" problem. Stiglitz and Weiss illustrate that the inability of lenders to distinguish between good and bad risks, prevents them from charging variable interest rates dependent on the actual risk. Accordingly, lenders are forced to increase the general cost of borrowing, which will tend to induce a problem of adverse selection, as good risks are driven from the market by the high costs of borrowing. Due to this information asymmetry, companies will tend to prefer internal to external financing, where available.

2.6.4 Agency Costs of Free Cash Flow

Another agency conflict developed by Jensen (1986) is the agency costs of free cash flow. Free cash flow is cash flow in excess of that required to fund all projects that have positive net present values when discounted at the relevant cost of capital. Conflicts of interest between shareholders and managers over payout policies are especially severe when the organization generates substantial free cash flow. The problem is how to motivate managers to expel the cash rather than investing it at below the cost of capital or wasting it on organization inefficiencies.

According to Jensen (1986), the agency costs of debt have been widely discussed, but the benefits of debt in motivating managers and their organizations to be efficient have been ignored. These effects are called the "control hypothesis" for debt creation. Managers with substantial free cash flow can increase dividends or repurchase stock and thereby pay out current cash that would otherwise be invested in low-return projects or wasted. This leaves managers with control over the use of future free cash flows, but they can promise to pay out future cash flows by announcing a "permanent"

increase in the dividend. Such promises are weak because dividends can be reduced in the future. Issuing large amounts of debt to buy back stock also sets up the required organizational incentives to motivate managers. Stock repurchases for debt or cash also has tax advantages. Increased leverage also has costs. As leverage increases, the usual agency costs of debt rise, including bankruptcy costs. The optimal debt-equity ratio is the point at which firm value is maximized, the point where the marginal costs of debt just offset the marginal benefits. The control hypothesis does not imply that debt issues will always have positive control effects.

Another solution that the agency theory of free cash flow, provided by Jensen (1986), are mergers and takeovers. Acquisitions are one way managers spend cash instead of paying it out to shareholders. Therefore, the theory implies managers of firms with unused borrowing power and large free cash flows are more likely to undertake low-benefit or even value-destroying mergers. But, a major benefit of such transactions may be that they involve less waste of resources than if the funds had been internally invested in unprofitable projects.

Value-increasing takeovers occur in response to breakdowns of internal control processes in firms with substantial free cash flow and organizational policies that are wasting resources. The debt created in a hostile takeover (or takeover defense) of a firm suffering severe agency costs of free cash flow is often not permanent. In these situations, levering the firm so highly that it cannot continue to exist in its old form generates benefits. It creates the crisis to motivate cuts in expansion programs and the sale of those divisions which are more valuable outside the firm. The proceeds are used to reduce debt to a more normal or permanent level. This process results in a complete rethinking of the organization's strategy and its structure. A much leaner and competitive organization results when it is successful.

2.6.5 Additional Research on the Agency Costs

In this part, we will see several research and studies on the agency costs theory. Mehran (1992) in his article, "Executive Incentive Plans, Corporate Control, and Capital Structure", explains: "Although, the findings presented, do not necessarily suggest that

agency theory provides a complete explanation for corporate capital structure, they do indicate that any theory that ignores agency issues is seriously incomplete". Several steps can be taken to align managers' interests with those of the shareholders. Mehran found a positive relationship between firm leverage and the percentage of (1) executive compensation in incentive plans, (2) equity owned by managers, (3) investment bankers on the board, and (4) equity owned by large individual investors. The first two work by tying management compensation to stock price, and the second two work by improving the knowledge and zealousness of monitors. These conditions help persuade or force management to adopt a riskier, more leveraged capital structure when appropriate.

Glen Ryen (1997), in his article "Capital Structure Decisions: What Have We Learned?" discussed two sets of agency problems: conflicts between managers and stockholders (as we have seen with Jensen theory) and those between stockholders and bondholders. In the conflict between managers and shareholders, Ryen added that overspending can also be a problem in businesses with an abundance of free cash flow. Managers have incentives to spend that cash on "perquisites" such as company jets, expense accounts, and so on. These actions are clearly not in the best interests of shareholders in general. In the conflict between bondholders and shareholders, after a bond issue has been sold, stockholders have incentives to maximize their wealth at the expense of debtholders in one of four ways: (1) increases in the dividend rate by reducing investment or, at the extreme, liquidating the firm; (2) claim dilution by issuing new debt of equal or higher priority than the old issue; (3) asset substitution, i.e. floating bonds for low-risk projects and then using the funds for high-risk projects instead; and (4) underinvestment; i.e. rejecting positive NPV projects if the benefits would accrue only to the bondholders. All four methods can serve to transfer wealth from bondholders to stockholders. Bondholders can protect themselves against such wealth appropriations by drafting bond covenants as part of the original flotation agreement. These covenants can limit the firm in terms of its production/investment policy, dividend payout rate, financing options. Smith and Warner (1979) advanced support for the Costly Contracting Hypothesis, which states that the indirect opportunity costs of bond covenants are significant. So the prevalence and variety of bond covenants in existence indicate that they are efficient in reducing agency costs. Assuming there are indeed benefits of risky debt, this hypothesis then states that for

each firm there exists an optimal amount of debt and an optimal set of bond covenants on that debt.

Other theorists argue that management positions in a company did not lead only to the rise of the agency costs and the conflict between shareholders and managers, rather, management positions and the decisions they take, produces some signals to the market. From these signals, one can predict the management decisions about financing a new investment opportunity and which in turn will affect the company's capital structure.

2.7 The Signalling Theory

Signal, as defined by Brigham and Houston (2001), is an action taken by a firm's management that provided clues to investors about how management views the firm's prospects. According to Brigham and Houston (2001), the announcement of a stock offering is generally taken as a signal that the firm's prospects as seen by its management are not bright. This, in turn, suggests that when a firm announces a new stock offering, more often than not, the price of its stock will decline. Brigham and Houston argue, since issuing stock emits a negative signal and thus tends to depress the stock price, even if the company's prospects are bright, a firm should, in normal times, maintain a reserve borrowing capacity that can be used in the event that some especially good investment opportunity comes along. This means that firms should, in normal times, use more equity and less debt than is suggested by the tax benefit/bankruptcy cost trade-off model.

Modigliani and Miller assumed that investors have the same information about a firm's prospects as its managers, this is called symmetric information. However, in fact managers often have better information than outside investors, this is called asymmetric information, and it has an impact on the optimal capital structure.

An important paper about the signalling theory developed by Ross (1977) titled "The Incentive-Signalling Approach". Ross theory started from the Modigliani-Miller theorem on the irrelevancy of financial structure. MM theory assumes that the market possesses full information about the activities of firms. If managers possess inside

information, then the choice of a managerial incentive schedule and of a financial structure, signals information to the market, and in competitive equilibrium the inferences drawn from the signals will be validated. As a result, the values of firms will rise with leverage, since increasing leverage increases the market's perception of value.

Ross (1977) in his paper made the usual perfect market assumptions: "Financial markets are competitive and perfect with no transaction costs or tax effects." Suppose that the market consists of two types of firms, A and B. it is currently time 0 and at time 1, A firms will have a total return of a, and B firms will return b with $a > b$. For simplicity, Ross assumed that pricing in the market is risk neutral. If there is no uncertainty in the market and investors can identify the A and the B firms, then, it should be clear that the valuations of firms A and B are unaffected by the mode of financing chosen by the firm.

Ross argued, moving to an uncertain world, investors cannot distinguish A firm from B firm. The result follows directly form the Modigliani-Miller propositions that valuation will be unaffected by the mode of financing. For example, it would be ineffective for A firms to attempt to inform the market, or signal that they were of type A rather than B. The difficulty is the moral hazard that B firms would give the same false signal, once again leaving the equilibrium one where firms cannot be discriminated. If the chosen mode of signalling is the financial structure, then since finance is costless, the market valuation will be the same for A and B firms and the only equilibrium will be where Value of A firm = Value of B firm.

According to Ross, one way to break out of the constraint that binds the value of A and B firms is to assume a significant role for the manager. If the manager of a firm is accountable for time 0 decisions, then there is a means of validating financial signals and avoiding the moral hazard problem. Of course, as being accountable the manager must also be assumed to have special or inside information about the firm's type. Here are the assumptions that Ross made in his paper:

Assumption 1: Manager-insiders are identical with firms as possessors of inside information. Furthermore, refinancing by outsiders conveys no information to the market.

Ross assumed also that managers know their own firm's type, but have no inside information about firms other than their own. Refinancing by outsiders, including other managers, will be assumed to convey no information, i.e., it will not alter the market's perception of the firm's type.

Assumption 2: Manager-insiders are compensated by a known incentive schedule (i.e., a given rule which investors know).

Also, Ross supposed that managers-insiders actually act to maximize their incentive compensation, this implies that they will set a level of debt financing, at time 0 so as to maximize the incentive compensation. In fact, the face value of debt is the only decision variable at the manager's discretion. In particular, the manager cannot trade in the financial instruments issued by his own firm.

The signalling equilibrium occurs if neither type of manger has an incentive to change signals and if the signals are valid. Now, an A manager will have no incentive to change. With no bankruptcy costs being incurred, the manager will obviously give a signal that the firm is of type A. Less obviously, the B type manager may not have an incentive to falsely signal that his firm is of type A. Given an incentive structure, the type A manager has a further incentive to modify it in such a way as to permit him to differentiate his firm through the financial package. With more types than two, type B managers then reply in such a way as to separate their firms from type C firms, given the constraints imposed by the financing-incentive schedule adopted by the A managers, and so on down the hierarchy.

Ross added: "*By making returns uncertain, we shall be able to create a natural incentive, comparable to bankruptcy risk, for managers to limit their debt financing to as low a value as is consistent with signalling. No manager will wish to give a false signal as long as the probability of bankruptcy is not one.*" Ross concludes that the incentive-signalling model provides a role for corporate finance within the framework that supports both the pricing theories and the Modigliani-Miller theory.

Leland and Pyle (1977) considered a situation where entrepreneurs use their retained share of ownership in a firm to signal its value. Owners of high value firms retain a high share of the firm to signal their type. Their high retention means they do not get to

diversify as much as they would if there was symmetric information and this makes it unattractive for low value firms to mimic them.

Lee et al (1983), in their paper "Screening, Market Signalling, and Capital Structure Theory", developed an equilibrium model in which informational asymmetries about the qualities of products offered for sale are resolved through a mechanism which combines the signalling and costly screening approaches. The model is developed in the context of a capital market setting in which bondholders produce costly information about a firm's imperfectly known earnings distribution and use this information in specifying a bond valuation schedule to the firm. Given this schedule, the firm's optimal choices of debt-equity ratio and debt maturity structure subsequently signal to prospective shareholders the relevant parameters of the firm's earnings distribution. Another influential paper about the signalling approach and insider information is developed by Myers and Majluf (1984), as we will see in details in the coming section.

2.8 Myers and Majluf (1984)

In this section we will discuss the theory of Myers and Majluf (1984) about "Corporate Financing and Investment Decisions When Firms Have Information that Investors Do Not Have". Consider a firm that has assets in place and also a valuable real investment opportunity. However, it has to issue common shares to raise the required cash to undertake the investment project. If it does not launch the project quickly, the opportunity will evaporate. Finance theory would advise this firm to evaluate the investment opportunity as if it already had plenty of cash on hand. Thus, the decision rule is: take every positive-NPV project, regardless of whether internal or external funds are used to pay for it. This section is divided in two parts the first is the model developed by Myers and Majluf, the second is a conclusion that summarizes the model.

2.8.1 Myers and Majluf model

What if the firm's managers know more about the value of its assets and opportunities than outside investors do? Nothing fundamental is changed so long as managers invest

in every project they know to have positive NPV. However, if managers have inside information there must be some cases in which that information is so favorable that management, if it acts in the interest of the old stockholders, will refuse to issue shares even if it means passing up a good investment opportunity. That is, the cost to old shareholders of issuing shares at a bargain price may outweigh the project's NPV. This possibility makes the problem interesting: investors, aware of their relative ignorance, will reason that a decision not to issue shares signals "good news". The news conveyed by an issue is bad or at least less good. This affects the price investors are willing to pay for the issue, which in turn affects the issue-invest decision. If the firm finally decides not to issue and therefore not to invest, real capital investment is misallocated and firm value is reduced. Of course, we would also expect management to try to rearrange the firm's capital structure to avoid being caught in this "financing trap" the next time the firm has a positive-NPV investment.

Myers and Majluf made the following assumptions:

- The firm, i.e. its managers, has information that investors do not have, and that both managers and investors realize this.
- The firm has one existing asset and one opportunity requiring investment. The investment can be financed by issuing stock, drawing down the firm's cash balance or selling marketable securities.
- The sum of cash on hand and marketable securities will be referred to as financial slack.
- The investment opportunity evaporates if the firm does not go ahead at time $t = 0$.
- Capital markets are perfect and efficient with respect to publicly available information.
- There are no transaction costs in issuing stock.
- Investors at time $t = 0$ do not know whether the firm's stock price will go up or down when that special information is revealed at $t = 1$. There are three dates, $t = -1, 0$ and $+1$. At $t = -1$, the market has the same information the management does. At $t = 0$, management receives additional information about the value of the firm's asset-in-place and investment opportunity, and updates their values accordingly. The market does not receive this information until $t = +1$.

- Management acts in the interest of the 'old' shareholders, those owning shares at the start of t = 0.
- Old stockholders are assumed passive[1]. They 'sit tight' if stock is issued; thus the issue goes to a different group of investors. Slack is fixed and known by both managers and the market.

According to Myers and Majluf, managers don't want to be forced to issue stock when their firm is undervalued by the market. Managers may have superior information, but why should that be a disadvantage? To admit that the firm is sometimes undervalued, then sometimes it must be overvalued. Why can't firms take advantage of the market by issuing securities only when the firm is overpriced? Slack has value because without it the firm is sometimes unwilling to issue stock and therefore passes up a good investment opportunity. Slack does not allow the firm to take advantage of investors by issuing only when stock is overvalued: if investors know the firm does not have to issue to invest, then an attempt to issue sends a strong pessimistic signal.

Why should stock issue always convey bad news? Might not investors view some issues as confirming the existence of a positive NPV opportunity? That ought to be good news, not bad. Myers and Majluf model rules out this optimistic response and states that the decision to issue stock always reduces stock price, unless the issue is a foregone conclusion. As a result, the firm may rationally forego a valuable investment opportunity if common stock must be issued to finance it.

Myers and Majluf will adapt the model to include the choice between debt and equity issues. If the firm can issue default-risk-free debt, the problem disappears; the firm never passes up a positive NPV investment. If it can only issue risky debt, the firm sometimes passes up positive NPV investments, but the average opportunity loss is less with debt than with equity financing. The general rule seems to be: "better to issue safe securities than risky ones". Myers and Majluf give a proof in their model that the firm never issues equity. If it issues and invests, it always issues debt, regardless of whether

[1] Stockholders are passive, meaning that they do not adjust their portfolios in response to the firm's issue-invest decision. Shareholders are active when they rebalance their portfolios.

the firm is over or under valued. Thus, the model may explain why many firms seem to prefer internal financing to financing by security issues and, when they do issue, why they seem to prefer bonds to stock.

Myers and Majluf argue that "*The chief difficulty with this analysis of the debt-equity choice is that we end up leaving no room at all for stock issues. We could of course recreate a role for them by introducing agency or bankruptcy costs of debt*". Giammarino and Neave (1982) set up a model in which the managers and investors share the same information about everything except risk. In this case, equity issues dominate debt issues, because the only time managers want to issue debt is when they know the firm is riskier than investors think. Investors, realizing this, refuse to buy. Only equity, or perhaps a convertible security, is issued in equilibrium.

It is more likely that managers having superior information act in old stockholders' interest. Also existing empirical evidence supports this view. If management acts in old shareholders' interests, the model predicts that the decision to issue and invest causes stock price to fall. If management took all and only positive-NPV projects, even when issuing and investing reduces the intrinsic value of the 'old' shares, the same decision would either increase stock price or leave it unchanged. The decision to invest would reveal the existence of an attractive project. This is good news, unless investors knew for sure that the firm would have that investment opportunity. It cannot be bad news in any case. Recent papers by Korwar (1981), Asquith & Mullins (1983), and Dann & Mikkelson (1984) show significant negative average price impacts when a new stock issue is announced. 'Information effects' are an obvious explanation.

The 'passive investor' assumption implies that stock price falls when stock is issued. However, stock price should not fall if default-risk-free debt is issued, because the ability to issue risk-free debt is equivalent to having ample financial slack, and having ample slack insures that the firm will take all positive-NPV projects. Thus, the only information conveyed by the decision to issue risk-free debt and invest is that the firm has a positive-NPV project. This causes a positive price change unless the project's existence was known beforehand. Under the 'active investor' assumption, the decision to invest would be bad news, and the choice of debt over equity financing would not make the news any better.

2.8.2 Myers and Majluf main conclusion

Myers and Majluf have presented a model of the issue-invest decision when the firm's managers have superior information. We can sum up by reviewing some of the model's most interesting properties:

1. It is generally better to issue safe securities than risky ones. Firms should go to bond markets for external capital, but raise equity by retention if possible. That is, external financing using debt is better than financing by equity.
2. Firms whose investment opportunities surpass operating cash flows, and which have used up their ability to issue low-risk debt, may forego good investments rather than issue risky securities to finance them. This is done in the existing stockholders' interest.
3. Firms can build up financial slack by restricting dividends when investment requirements are modest. The other way to build slack is by issuing stock in periods when managers' information advantage is small.
4. The firm should not pay a dividend if it has to recover the cash by selling stock or some other risky security. Of course dividends could help convey managers' superior information to the market.
5. When managers have superior information, and stock is issued to finance investment, stock price will fall, other things equal. This action is nevertheless in the (existing) stockholders' interest. If the firm issues safe default-risk-free debt to finance investment, stock price will not fall.

From these theories about signals and information asymmetry problems, the so called "pecking order model" was derived. An influential article about the pecking order model is developed by Myers and Shyam (1994) that will be our topic in the coming section.

2.9 Pecking Order Model

This section is divided in two parts; the first will mention the model developed by Myers and Shyam (1994) "Testing Static Trade-off against Pecking Order Models of

Capital Structure". The second will mention additional theories and studies on the pecking model.

2.9.1 Myers and Shyam (1994)

The working paper, by Myers and Shyam, tests traditional capital structure models against the alternative of a pecking order model of corporate financing. The basic pecking order model, which predicts external debt financing driven by the internal financial deficit, has much greater explanatory power than a static trade-off model which predicts that each firm adjusts gradually toward an optimal debt ratio.

The theory of capital structure has been dominated by the search for optimal capital structure. Optimums normally require a tradeoff, for example between the tax advantages of borrowed money and the costs of financial distress when the firm finds it has borrowed too much. In the pecking order theory, there is no well-defined optimal debt ratio. The attraction of interest tax shields and the threat of financial distress are assumed second-order. Debt ratios change when there is an imbalance of internal cash flow, net of dividends, and real investment opportunities. Highly profitable firms with limited investment opportunities work down to lower debt ratios. Firms whose investment opportunities outrun internally generated funds borrow more and more. Changes in debt ratios are driven by the need for external funds, not by any attempt to reach an optimal capital structure. Myers and Shyam conclude that the pecking order is a much better first-cut explanation of the debt-equity choice and they question the evidence for an optimal debt ratio.

In its simplest form, the pecking order model of corporate financing says that when a firm's internal cash flows are inadequate for its real investment and dividend commitments, the firm issues debt. Equity is never issued, except possibly when the firm can only issue junk debt and costs of financial distress are high. The simple pecking order predicts that the firm will only issue or retire equity as a last resort.

Myers and Shyam main empirical results can be summarized as follows:

1. The pecking order is an excellent first-order descriptor of corporate financing behavior, at least for our sample of mature corporations.
2. The simple target adjustment model, when tested independently, also seems to perform well.
3. When the two models are tested jointly, the coefficients and significance of the pecking order models change hardly at all; the performance of the target-adjustment model degrades, though coefficients still appear statistically significant.
4. The strong performance of the pecking order does not occur just because firms fund unanticipated cash needs with debt in the short run. Myers and Shyam results suggest that firms plan to finance anticipated deficits with debt.
5. Myers and Shyam experiments show that the simple target adjustment models are not rejected even when false; the pecking order, when false, can be easily rejected.

Overall, the results suggest greater confidence in the pecking order than in the target adjustment model. If Myers and Shyam sample companies did have well-defined optimal debt ratios, it seems that their managers were not much interested in getting there.

2.9.2 Additional research on the Pecking order

In this section we will see several research and studies on the pecking order model. A paper, by Huang and Gregoire (2003) "Insider Trading and the Pecking Order", develops a model with two publicly traded firms, one of which (firm 1) is considering whether to issue debt or equity to finance its activities. Each firm is run by an insider who will be informed of his firm's cash flow before all other market participants and who can trade upon this private information. The potential buyer of firm 1's securities (the investor) may have to trade for liquidity reasons before cash flows are realized and can freely allocate his trades between the two firms. Before trade takes place, each insider commits to a disclosure policy that serves to attract the investor's discretionary liquidity trades. Huang and Gregoire find that firm 1's insider is more likely to issue equity in the absence of non-discretionary liquidity trades (noise trades) in its stock.

That is, the pecking order of financing is less likely to be followed by firms with low trading volume than firms with high trading volume.

Some evidences exist in favor of the static trade-off and optimal capital structure. Several authors, such as Schwartz and Aronson (1967), have documented evidence of strong industry effects in debt ratios, which they interpret as evidence of optimal ratios. Long and Malitz (1985) show that leverage ratios are negatively related to research and development expenditures, which they use as a proxy for intangible assets. Smith and Watts (1992) also document a negative relation between growth opportunities and debt ratios. Mackie-Mason (1990) reports evidence that firms with tax loss carry forwards are less likely to issue debt. This conclusion is consistent with Miller and Modigliani (1966), who detected the positive effects of interest tax shields in the market values of electric utilities.

However, Titman and Wessels (1988), using a latent variables approach, have found only mixed evidence for the role of the factors predicted by the static tradeoff theory. Other evidence is inconsistent with the optimal debt ratios or can be interpreted differently. First, as pointed out by Myers (1984), the negative valuation effects of equity issues or leverage-reducing exchange offers — see Masulis (1980) — do not support the tradeoff story. If changes in debt ratios are movements towards the top of the curve, both increases and decreases in leverage should be value enhancing. Second, Kester (1986), Titman and Wessels (1988) and Rajan and Zingales (1995) find strong negative relationships between debt ratios and past profitability. Models based on the tradeoff of the tax benefits of debt and the costs of financial distress predict a positive relation. In Myers's (1984) and Myers and Majluf's (1984) pecking order model, as we have seen, there is no optimal debt ratio. Instead, because of asymmetric information and signaling problems associated with external funding, firms' financing policies follow a hierarchy, with a preference for internal over external finance, and for debt over equity. A strict interpretation of this model suggests that firms do not aim at any target debt ratio; instead, the debt ratio is just the cumulative result of hierarchical financing over time.

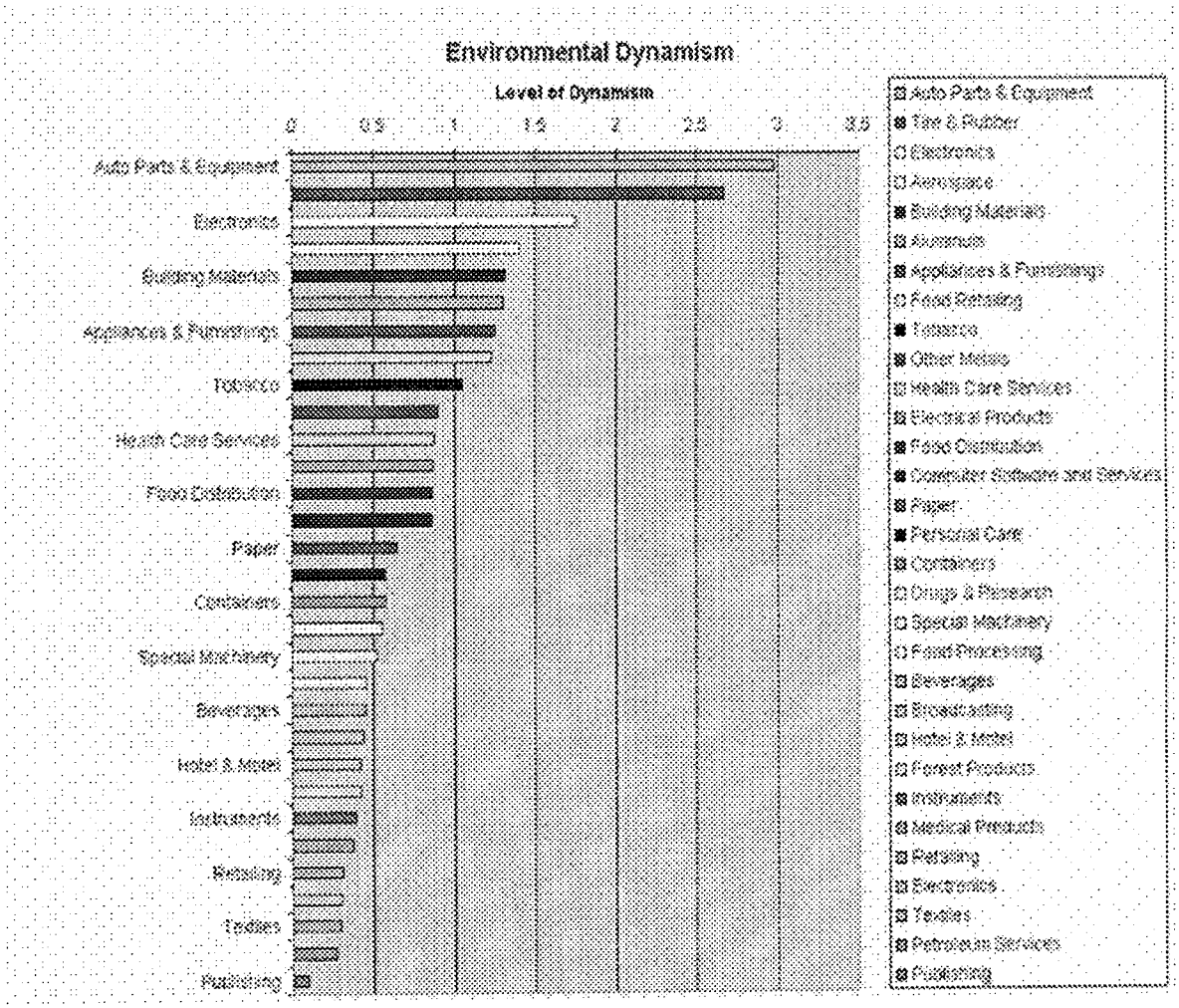
2.10 Some Empirical Studies on the Capital Structure

In this section we will mention some influential empirical studies performed to test the above mentioned theories and their effects on the capital structure. A paper by Han-Suck Song (2005) analyses the explanatory power of some of the theories that have been proposed in the literature to explain variations in capital structures across firms. In particular, this study investigates capital structure determinants of Swedish firms based on a panel data set from 1992 to 2000 comprising about 6000 companies. Swedish firms are on average very highly leveraged, and furthermore, short-term debt comprises a considerable part of Swedish firms' total debt– short-term debt ratio amounts to almost 50%. Therefore, the paper studies determinants of total debt ratios as well as determinants of short-term and long-term debt ratios. The results indicate that most of the determinants of capital structure suggested by capital structure theories appear to be relevant for Swedish firms. Profitability is negatively correlated with all three leverage measures, which is in line with the pecking-order theory; firms prefer using surplus generated by profits to finance investments. This result may also indicate that firms in general always prefer internal funds rather than external funds, irrespective of the characteristic of an asset that shall be financed.

The results reveal that size is a significant determinant of leverage. But while size is positively related to both total debt and short-term debt ratio, it is negatively correlated with long-term debt ratio, although, the economic significance is rather small for the latter case. There exists no relationship between expected growth and leverage that is of economic significance. One possibly explanation may be that the measure used, the percentage change in total assets, does not reflect future growth possibilities, only past growth. The effect of income variability on debt is approximately zero, but still statistically significant. This may be due to the fact that the time period studied coincided with a period of strong economic recovery and a generally positive trend in revenues. These findings suggest that future analysis of leverage determinants should be based on not only long-term or total debt ratios, but on short-term debt ratios as well. This may be of particular interest and importance for the Swedish case, since short-term debt constitutes a major part of total debt.

Another research performed by Roy Simerly and Mingfang Li (2000), revealed that taking on more debt to solve management problems can be dangerous for the long-term health of a firm and that decisions concerning the capital structure must take into consideration the competitive environment of the firm. The paper states that across industries there are significant differences in the environmental characteristics impacting firms. Most relevant among these characteristics is environmental dynamism, defined as the rate of environmental change, and the instability of that change. Environmental dynamism is a product of several forces operating at one time. These include an increase in the size and number of organizations within an industry, and an increase in the rate of technological change and its diffusion throughout that industry. Table 2.2 is a rank ordering of industries based on the degree of measured environmental dynamism. Industries toward the top of the table are in industries characterized as having a high level of dynamism.

Table 2.2: Environmental Dynamism (Simerly and Li, 2000)



These data were used to examine the economic performance of over 700 firms across 31 industries. The results are shown in Figure 2.5 below. Simerly and Li found that those firms in industries characterized as exhibiting high levels of dynamism were more successful if they had relatively low levels of debt. In other words, debt was negatively related to profit in these industries. Simerly and Li further examined the relationship between debt and innovation with similar findings. In more dynamic environments debt-holders are less likely to appreciate the need to invest in long-term projects with questionable pay-offs.

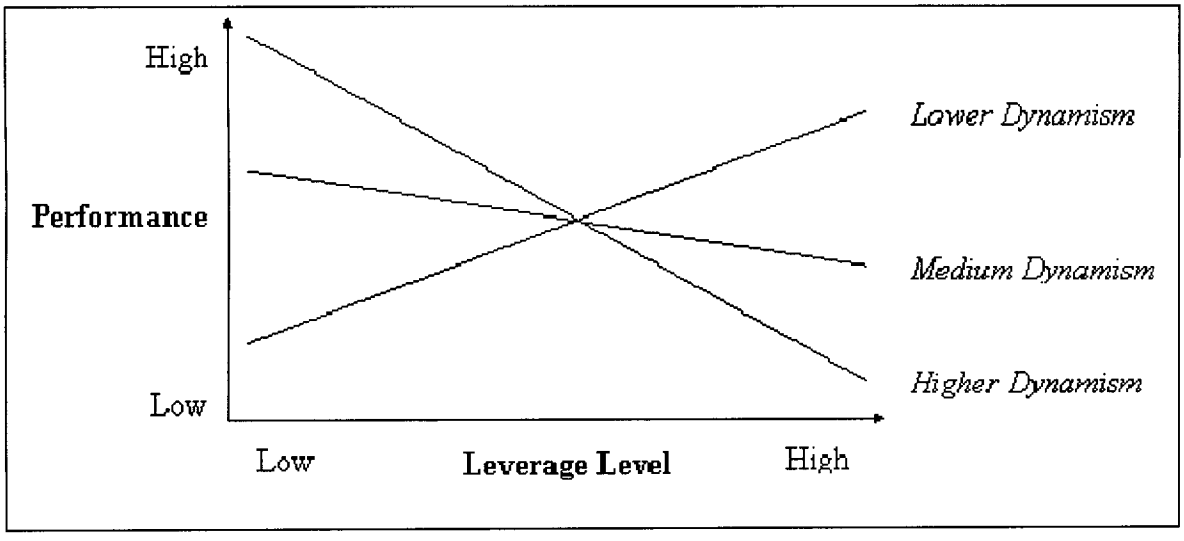


Figure 2.5: The relationship between economic performance and debt across types of environment (Simerly and Li, 2000)

The results demonstrated in Figure 2.5 show that those firms in industries toward the top of the table should choose equity over debt in financing projects with uncertain outcomes. Those firms in industries toward the bottom of the table should consider increasing debt to increase returns to investors. There are practical examples of this from the 1990s. Coke, located in an industry toward the bottom of the table, did increase its debt in 1998. This resulted in a significant increase in shareholder wealth and returned excess cash flow to investors. In contrast, Kodak, located in an industry toward the top of the table, has struggled through most of the 1990s with excess debt relative to other firms in its industry. As a result, investors have forced the firm to cut

back on necessary research and development, and inhibited the firm's expansion into emerging high tech industries.

Haan and Hinloopen (1999) performed an empirical study of security issues by Dutch companies. They considered empirically the incremental financing decisions for a sample of 153 quoted companies during the years 1984 through 1997 (Figure 2.6). They considered the choice between three types of external finance: private loans, bonds and shares. The results provide evidence for the pecking order theory. The issuance behavior appears not to be consistent with long-term capital structure targets.

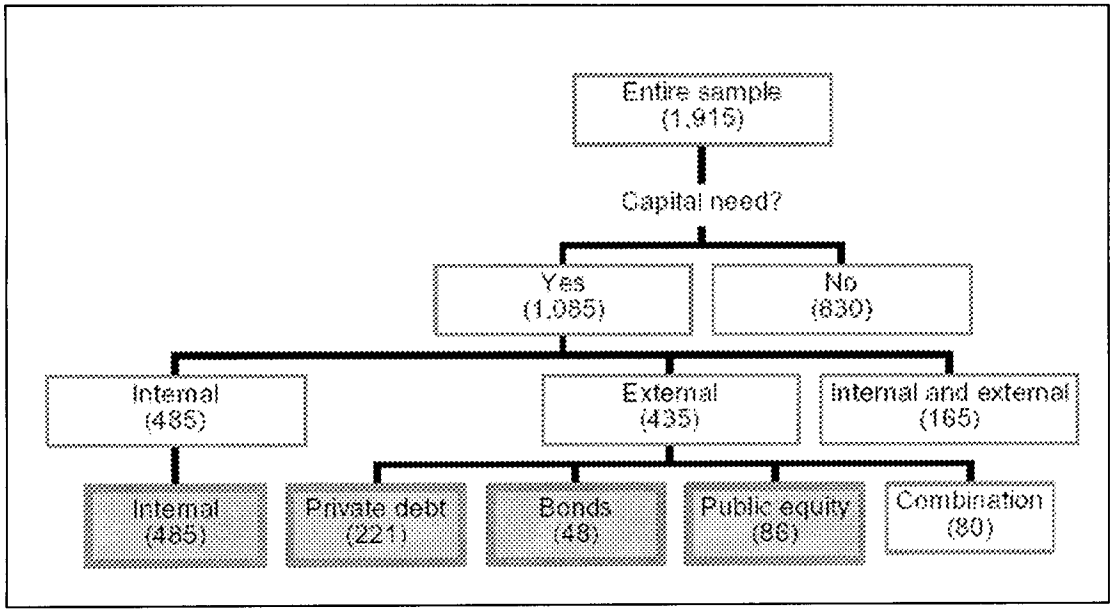


Figure 2.6: Sample selection (Haan and Hinloopen, 1999)

Haan and Hinloopen main results can be summarized as follows. They rejected the view that firms move towards a target debt ratio when they make issue decisions. In particular, firms that have cash surpluses or have been profitable in the recent past are less likely to finance investment projects externally, and hence passively move towards lower debt ratios without trying to readjust their capital structures by active issuance behavior. Further, it appeared that past stock price increases are positively related with the likelihood of issuing equity, a finding that is in accordance with Opler and Titman (1997) and de Jong and Veld (1998). All in all, Haan and Hinloopen found strong support for the pecking order theory.

Another empirical investigation performed by Dimitrios Vasiliou (2002) took a sample of 129 Greek firms listed in the Athens Stock Exchange during the period 1997 – 2001. The objective is to examine how some specific firm characteristics affect the determination of capital structure of the firms. The number of the firms in the sample reflects the 63% of the listed firms in 1996. Vasiliou tested the hypothesis that the debt ratio (i.e. total liabilities divided by total assets) at time t depends upon the size of the firm at time t, the non-debt-tax-shield (NDTS) of the firm at time t, the firm's tax payout ratio at time t-1 and the growth of the firm at time t. The empirical results justify the hypothesis that there is a positive relation between leverage and the size of the firm and an inverse relation between the debt ratio and the NDTS, the tax payout ratio and the growth of the firm. Moving to the variables used in the analysis, first Vasiliou defined the dependent variable which is the debt ratio as the ratio of total debt divided by the total assets of the firm. Total debt contains both long-term and short-term liabilities. However, firms in Greece use either very little – less than 10% – or no long-term capital, mainly because of the reluctance of the banking sector to provide long-term financing with attractive terms. As a result, they most of the times turn to short-term debt capital so as to finance even their long-term investments. Thus, Vasiliou decided to include short-term financing as a measure of leverage. The most important measure of NDTS is the depreciation ratio defined as depreciation divided by total assets[2]. The tax payout ratio is defined as the tax payments of the firm divided by its earnings before taxes. The growth is measured as the annual change on earnings. The results show that the debt ratio of the firm is positively related to its size. The size of the firm is measured using the sales figure. Larger firms depend more on debt capital than small firms. On the other hand, there seems to be an inverse relationship between the debt ratio and the non-debt-tax shields (NDTS), the tax payout ratio with one year lag and the growth of the firms. Firms that can avoid taxes through NDTS do not need to use much debt capital. Firms' liquidity is relatively smaller for firms that pay large amount of taxes and thus these firms will decide to employ less debt fearing the costs of financial distress. Finally, firms that have considerable growth opportunities employ less debt capital in their capital structure.

[2] The depreciation ratio, defined as depreciation divided by total assets, is commonly used by other researchers as a proxy for NDTS [i.e. Wald (1999)]. The higher NDTS a firm can use, the more tax can avoid.

Agarwal and Mohtadi (2001) studied the role of financial market development in the financing choice of firms in developing countries. Their sample data consisted of 21 developing countries from 1980 to 1997. These countries were chosen because they have an emerging stock market and because data on individual firms' financial structure are available for a sufficiently large number of firms (Appendix B). The results suggested that equity market development favors firms' equity financing over debt financing, while banking sector development favors debt financing over equity financing, as one would expect. However, surprisingly, equity markets exhibited somewhat stronger influence in the short-run than they do over the long-run. Results from the dynamic panel model showed that if both elements of the financial sector develop simultaneously, the long run debt-equity ratio, while rising, will converge to a stable value.

Ramamurti and Vernon (1991) show significant variations in capital structures among emerging market economy firms. They have used aggregate firm-level data for a sample of 21 emerging markets from 1980-1997. For example, equity financing seems to be high in Brazil (with 2/3 equity financing) and Malaysia, but low in India and Pakistan (with 1/3 equity financing). What explains these variations? Samuel (1996) suggests that variations in the debt-equity mix depend on the macroeconomic environment as well as on controls and interventions in domestic capital markets. Thus, there may be a pre-disposition toward debt when interest rates are controlled and the real after-tax cost of debt is negative (India through the 1980s); high inflation and the associated uncertainty may create a scarcity of long term instruments, forcing reliance on equity (Brazil); and high growth and interest in emerging markets may create incentives for firms to issue equity (Malaysia).

Marsh (1982) performed an empirical study of security issues by UK companies between 1959 and 1974. The study focused on how companies select between financing instruments at a given point in time. It threw light on a number of interesting questions. First, it demonstrated that companies are heavily influenced by market conditions and the past history of security prices in choosing between debt and equity. Second, it provided evidence that companies appear to make their choice of financing instrument as if they have target levels of debt in mind. Finally, the results were consistent with the

notion that these target debt levels are themselves a function of company size, bankruptcy risk, and asset composition.

Miguel and Pindado (2001) analyzed the firm characteristics which are determinants of capital structure according to different explanatory theories, and how institutional characteristics affect capital structure. They have developed a target adjustment model, which has then been confirmed by empirical evidence. It highlights the fact that the transaction costs borne by Spanish firms are inferior to those borne by US firms. Their results are consistent with tax and financial distress theories and with the interdependence between investment and financing decisions. The results also provide additional evidence on the pecking order and free cash flow theories. Moreover, the evidence obtained confirms the impact of some institutional characteristics on capital structure.

2.11 Conclusion

Many interesting questions have been raised over the years: Is there really an optimal capital structure for any individual firm or industry? Does that ratio stay constant over time? Why have corporate leverage ratios not fluctuated in tune with changes in the corporate tax rate? Why do leverage-altering transactions (stock and/or debt offerings, swaps, buy-backs) have such consistent effects on firm stock price? Although most of the literature on the topic points to the existence of optimal capital structures, no one theory has emerged to explain all these phenomena.

The conclusion to be derived from the above mentioned literature on capital structure and financing decisions is the absence of any universal consensus on optimal financing structure. The influential work in this area was by Modigliani and Miller (1958). They showed that with perfect markets and without taxes, the total value of a firm is independent of its debt/equity ratio. Similarly, they proved that the value of the firm is independent of the level of dividends. In their framework, it is the investment decisions of the firm that are important in determining its total value.

The existence of a tax advantage for debt financing does not necessarily mean that corporations should at all times seek to use the maximum possible amount of debt in their capital structures. For one thing, other forms of financing, notably retained earnings, may in some circumstances be cheaper. More important, there are limitations imposed by lenders. These additional considerations imply the maintenance by the corporation of a substantial reserve of untapped borrowing power. The tax advantage of debt may well tend to lower the optimal size of that reserve. All of these led to the Trade-Off theory of capital structure. Some debt is desirable because of the tax shield arising from interest deductibility, but the costs of bankruptcy and financial distress limit the amount that should be used. Moreover, debt, from the agency's point of view, is preferable since it reduces the agency cost between managers and shareholders. However, as the level of debt increases the agency problem between bondholders and shareholders increase. For this, the result is a trade-off between debt and equity.

The tax advantage of debt, relative to the magnitude of expected bankruptcy costs, would seem to imply that firms should use more debt than is actually observed. Miller (1977) attempt to explain this was not successful. In Miller model, there is a personal tax advantage to equity because capital gains are only taxed on realization and a corporate tax advantage to debt because interest is tax deductible. In equilibrium, people with personal tax rates above the corporate tax rate, hold equity while those with rates below, hold debt. However, these predictions were not consistent with what happened in reality.

Myers and Majluf (1984) assume that a potential purchaser of securities has less information about the prospects of the firm than management, and that management is more likely to issue securities when the market price of the firm's traded securities is higher than management's assessment of their value. Sophisticated investors revise their estimate of the value of the firm if management announces a new security issue; furthermore, the larger the potential disparity in information, the greater the revision in expectations and the larger the negative price reaction to the announcement of a new issue. This information gap has at least two potential consequences for the capital structure debate. The first is the possible existence of a financial pecking order firms may follow when financing new projects. The second involves the various signals companies can send to the market with different financial transactions.

The Pecking Order hypothesis predicts that if company insiders happen to believe the firm's stock has been underpriced in the market, they will hesitate to issue new stock, even for a positive NPV project. Underpricing the equity may lead new buyers to gain more than the NPV of the new project, at the expense of current shareholders. The company would much rather finance the project with retained earnings or riskless debt, both of which will not be undervalued.

There is much room for improvement in the explanatory and predictive ability of capital structure theories. It is obvious that none of the theories has reached a target debt-to-equity ratio for an optimal capital structure. Therefore, the objective of my empirical study is to test the relationship between debt-to-equity ratios and companies' performance.

Chapter 3: Research Methodology

Much of the financial literature over the past four decades has revolved around different theories that try to explain just exactly what does matter in determining capital structure. The determination of an optimal capital structure has been one of the most contentious topics since Modigliani and Miller (MM) introduced their capital structure irrelevancy propositions in the American Economic Review in 1958. The last four decades, then, have seen much development in the literature available on the capital structure debate. MM Proposition I guided subsequent researchers by proving that capital structure could be irrelevant under a very strict set of assumptions.

The conclusion to be derived from the above mentioned literature on capital structure and financing decisions is the absence of any universal consensus on optimal financing structure. There is much room for improvement in the explanatory and predictive ability of capital structure theories. It is obvious that none of the theories has reached a target debt-to-equity ratio for an optimal capital structure. Therefore, the objective of my research is to observe whether a certain level of Debt-to-Equity ratio will increase firms' performance.

In this chapter we will see the main objective of this paper, the null and alternative hypotheses, definition of variables, the market for which the study will be applied, the size and reason of my sample, how to test the hypotheses, the statistical package used, and the conclusion.

3.1 Objective

From the literature review we could see that there are some benefits from using debt in the companies' capital structure (e.g. profitability increases) and at the same time there are some disadvantages on relying heavily on debt[3] (e.g. bankruptcy costs increase). We would predict that a certain level of debt would benefit companies and the main objective is to find whether a certain level of Debt-to-Equity ratio will increase firms'

[3] See Trade-off and Agency theories for example

performance. We are going to observe the behavior of the UK market and in terms of the US; the results will be of interesting as we can compare them together.

3.2 Hypotheses

The null (H_0) hypotheses will be:

H_0: There is no relationship between capital structure and firms' performance

In this paper, we will test the relationship between capital structure and firm's performance.

3.3 Data Collection

In this project, secondary data will be used from the FTSE 350 which is an index for the largest 350 firms in the UK. The source of data is Datastream by the University of Surrey and the data are for the year 2002. Appendix A lists all the dependent and independent variables used in this empirical study. Financial institutions were excluded since they have special regulations that make the study of capital structure irrelevant. Other companies were excluded as well since not all the ratios were available for them. For this, the size was reduced to reach 129 firms. Further, companies were grouped based on the industry they belong to. In order to take into consideration the industry effect we used Datastream groups and the 129 companies were sorted as follows:

Utility	5
Transportation	13
Service	14
Electronic	8
Chemical	9
Media	6
Engineering	9

Construction	21
Retail	20
Hotel & Food	14
Total	**129**

As mentioned by Modigliani and Miller that size of the firm is very important in the determinant of the capital structure. Taking FTSE 350 ensures that the sample is homogenous since all firms are nearly of the same size. Moreover, data is acquired for the same years. So size is controlled in this sample first, by using homogeneous data since we scaled companies according to their corresponding industries, and second, by using a control variable Ln (TS). The reason we chose TS (Total Sales) rather than Assets is that we don't want to increase the colinearity among the variables.

The market that will be studied in this paper is for the UK since it is a matured market and easily accessed, with many listed companies that have traded stocks and available financial information. During my research, most of the studies were performed on the USA. Few studies were performed on the UK but, as for to my knowledge, this will be the first study to look at the behavior of capital structure among FTSE 350. There was a possibility of choosing the Middle East since none of the empirical studies on capital structure was performed on this area. However, I could not find information for the Middle East market since I required financial data for listed companies but that market is very primitive and small, so financial information are not easily accessed.

The companies that I will choose must be listed companies under the stock exchange in order to have a stock price and market value for equity that will be used to analyze companies' performance. For this, I chose the FTSE 350 that includes a sample of homogeneous data for the largest 350 companies in the UK. The size was reduced to 129 companies since I excluded many companies that did not have all the needed data and I excluded financial institutions. Financial institutions are excluded since by nature of their business they require a high degree of leverage and they are subject to regulations from the central bank and recently Basle I and Basle II that requires

financial institutions to have a minimum capital in order to compete internationally and to minimize risks.

3.4 Definition of Variables

Firms' performance in this project will be measured using Stock price, Return on Assets (ROA), and Tobin's Q (TQ) which are the dependent variables. While capital structure, will be measured using Gearing ratio, Debt-to-Equity ratio, and two control variables (Total Sales and stock Volatility) which are the independent variables. Debt will be measured by total liabilities (long-term and short-term) plus preferred stocks and equity will be measured taking into consideration both its book value and its market value.

3.4.1 Dependent Variables

The dependent variable in the above hypotheses is firms' performance. There are contradictory results regarding the proper performance measure. In some papers, ratio analysis such as ROA has been used, while in other papers stock price return has been used. Some recent papers combine both accounting and market performance, in order to develop a more reliable performance measure and to overcome the weaknesses of both accounting (ROA) and market measures (Stock Price), such as Tobin's Q. For this, in my opinion, Tobin's Q will give better results than ROA or share price. In this project, firms' performance will be measured using the following variables: Stock Price (P), Return on Assets (ROA), and Tobin's Q.

3.4.1.1 Stock Price (P)

Stock prices tend to move in trends, which last a variable amount of time then typically slow down, pause, and finally reverse. These stages represent investors forming new expectations which change the balance between supply and demand. For this, stock price shows the current market value of a company.

Stock price was used by Agarwal and Mohtadi (2001) to study the role of financial market development in the financing choice of firms in developing countries. Their sample data consisted of 21 developing countries from 1980 to 1997. These countries were chosen because they have an emerging stock market and because data on individual firms' financial structure are available for a sufficiently large number of firms. Marsh (1982) performed an empirical study of security issues by UK companies between 1959 and 1974; he demonstrated that companies are heavily influenced by market conditions and the past history of security prices in choosing between debt and equity. Also, Friend and Lang (1988) in their empirical test of the impact of managerial self-interest on corporate capital structure used the value of stocks. Moreover, Haan and Hinloopen (1999) performed an empirical study of security issues by Dutch companies; they considered stock price behavior as the result of issuing debt or equity.

In this study, P was calculated by taking the average of eight weeks (four prior to the publication of the firm's annual profit and 4 weeks after) in order to avoid as much as possible the effect of announcing a firms' annual result on its stock price. However, market returns models (stock price or returns based on stock price) impound market expectations about a firm's future and thus may not be able to capture managers' current performance. It also may not be an efficient contracting parameter because it is driven by many factors beyond the control of the firms' executives (Bacidore *et al* 1997). Any new management decision will take time to be known to the public and accordingly stock price will be affected after a period of time and not immediately. For this, some researchers prefer to use ROA as an indicator of companies' performance.

3.4.1.2 Return on Assets (ROA)

An indicator of how profitable a company is relative to its total assets. ROA gives an idea as to how efficient management is at using its assets to generate earnings. Calculated by dividing a company's annual earnings by its total assets, ROA is displayed as a percentage. Sometimes this is referred to as "return on investment".

The assets of the company are comprised of both debt and equity. Both of these types of financing are used to fund the operations of the company. The ROA figure gives

investors an idea of how effectively the company is converting the money it has to invest into net income. The higher the ROA number, the better, because the company is earning more money on less investment. For example, if one company has a net income of $1 million and total assets of $5 million, its ROA is 20%; however, if another company earns the same amount but has total assets of $10 million, it has an ROA of 10%. Based on this example, the first company is better at converting its investment into profit. When you really think about it, management's most important job is to make wise choices in allocating its resources. Anybody can make a profit by throwing a ton of money at a problem, but very few managers excel at making large profits with little investment.

ROA for public companies can vary substantially and will be highly dependent on the industry. This is why when using ROA as a comparative measure, it is best to compare it against a company's previous ROA numbers or the ROA of a similar company.

However, ROA and other financial ratio measures of returns are inadequate instruments because they ignore the cost of capital, motivating dysfunctional behavior causing managers to pay attention to the "wrong" things (Aggarwal, 2001). An ROA of 12% may be for one firm very high and profitable if the firm's cost of capital is very low comparably. However, if a firm's cost of capital is 11% with an ROA of 12%, the firm will end up with only 1% return. For this, another measure of companies' performance will be used, which is the Tobin's Q.

3.4.1.3 Tobin's Q (TQ)

Another measure of performance, Tobin's q, is the ratio of the market value of a firm's assets (as measured by the market value of its outstanding stock and debt) to the replacement cost of the firm's assets. This measure of Q is likely to capture growth opportunities. If Q is greater than one (100%), the inference is that the market values current the firm's assets (including intangibles) more highly than it would in their next best alternative use, their replacement cost.

The advantage of using Tobin's q is that the difficult problem of estimating either rates of return or marginal costs is avoided. On the other hand, for q to be meaningful, one needs accurate measures of both the market value and replacement cost of a firm's assets.

It is usually possible to get an accurate estimate for the market value of a firm's assets by summing the values of the securities that a firm has issued, such as stocks and bonds. It is much more difficult to obtain an estimate of the replacement costs of its assets, unless markets for used equipment exist. Moreover, expenditures on advertising and research and development create intangible assets that may be hard to value. Typically, researchers who construct Tobin's q ignore the replacement costs of these intangible assets in their calculations. For that reason, q typically exceeds 1 (100%). Accordingly, it can be misleading to use q as a measure of market power without further adjustment. (Lindenberg and Ross, 1981)

There are a number of methods used in the previous literature to capture Tobin's Q. Perfect and Wiles (1994) argue that the Lindenberg and Ross method for estimating Q values is difficult to use because it relies upon companies' reporting replacement cost estimates which are not available all the time. On the other hand, Chung and Pruit (1994) and Perfect and Wiles (1994) summarize and compare these measures. Chung and Pruit (1994) define an approximate Q by assuming that the book value of assets is equal to their replacement cost and find that this simple measure is highly correlated with Lindenberg and Ross' more theoretically correct model. In this study, replacement costs for most of the companies in our sample are not available and therefore we will assume that the book value of assets is equal to their replacement cost. Accordingly, Tobin's Q equals:

$$\frac{BVTA + MVE - BVE}{BVTA}$$

BVTA (the book value of total assets, Datastream item 392) is the sum of Cash and due from banks, total investments, net loans, customer liability on acceptance, investment in

unconsolidated subsidiaries, real estate assets, net property, plant and equipment and other assets.

MVE (market value of equity, Data-stream item MV) is the share prices multiplied by the number of ordinary shares in issue. The amount in issue is updated whenever new trenches of stock are issued or after a capital change. In order to avoid the effect of financial statement publication on the stock price formation, the average stock price of four weeks prior and 4 weeks after the balance sheet date was used to calculate market value of equity.

BV (book value of equity, Data-stream item 305) is the equity share capital and reserves of the company i.e. ordinary share capital, other equity capital, share premium account and reserves.

3.4.2 Independent Variables

The independent variable in the above hypotheses is capital structure. Capital structure will be measure using the following variables: Gearing ratio, Debt-to-Equity ratio, and two control variables (Total sales and Volatility).

3.4.2.1 Gearing Ratio

It should be noted that there is contradictory evidence about the use of the market value of equity or book value of equity. Some of the previous studies have used the book value of equity, arguing that although the theory of capital structure suggests that debt ratios should be measured in market value terms management prefers to use the book value. In his paper, Muradoglu et al (2004), investigates the predictive ability of gearing in the long term for UK firms. Robustness tests are carried out to examine the returns in excess of that attainable using book to market, price earnings and size as risk factors.

The higher a company's degree of leverage, the more the company is considered risky. As for most ratios, an acceptable level is determined by its comparison to ratios of companies in the same industry. For this, the gearing ratio will be scaled to its industry. A company with high gearing (high leverage) is more vulnerable to downturns in the business cycle because the company must continue to service its debt regardless of how bad sales are. A greater proportion of equity provides a cushion and is seen as a measure of financial strength.

Myers (1977) argues that market values incorporate the present values of future growth opportunities. Debt issued against these values can distort future real investment decisions. Accordingly, in this study capital gearing will be measured using two ratios: the book value of gearing and the market value of gearing as defined below.

3.4.2.1.1 Book value of Capital Gearing (BG)

This is the ratio of total debt plus preference share capital to total assets, where: Total debt is the total of all long and short-term borrowings (Data-stream, item: 1301). Preference share capital is the capital, which has a fixed dividend and does not participate further in the company's profits (Data-stream, item: 306). Total Assets is the book value of total assets and is defined below (Data-stream, item: 392).

3.4.2.1.2 Market value of Capital Gearing (MG)4

This is the ratio of total debt plus preference share capital to total debt plus preference share capital plus the market value of the common stock, where market value of equity capital share is defined as the number of shares outstanding (data-stream, item: NS), multiplied by the stock prices (data-stream, item: P) at the balance sheet date. In order to avoid the effect of financial statement publication on the stock price formation, the average stock price of four weeks prior and 4 weeks after to the balance sheet date was used to calculate market value of equity.

[4] We have also used book and market values of debt in calculating the debt-to- equity ratio

3.4.2.2 Debt-to-Equity ratio (D/E)

Debt-to-Equity is a measure of a company's financial leverage calculated by dividing long-term debt by stockholder equity. It indicates what proportion of equity and debt the company is using to finance its assets. Sometimes only interest-bearing long-term debt is used instead of total liabilities in the calculation. But, in this paper total liabilities plus preference share capital will be used to measure the value of debt. Only Book Debt-to-Equity will be used since not all ratios for Market Debt-to-Equity were available.

A high debt/equity ratio generally means a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense. If a lot of debt is used to finance increased operations (high debt to equity), the company could potentially generate more earnings than it would have without this outside financing. If this were to increase earnings by a greater amount than the debt cost (interest), then the shareholders benefit as more earnings are being spread around to the same amount of shareholders. However, the cost of this debt financing may outweigh the return that the company generates on the debt through investment and business activities and become too much for the company to handle. This might lead to bankruptcy, which would leave shareholders with nothing, so it is a delicate balance. This is what the leverage effect is about and what the debt/equity ratio measures.

Debt/equity ratio is dependent on the industry in which the company operates. For example, capital-intensive industries such as auto manufacturing tend to have a debt/equity ratio above 2, while personal computer companies have a debt/equity of under 0.5. Since the ratio varies widely between industries, the debt/equity ratio will be scaled according to its industry.

Debt to equity ratio was used by Han-Suck Song (2005) in its paper that investigates capital structure determinants of Swedish firms based on a panel data set from 1992 to 2000 comprising about 6000 companies. In his paper, Song studies determinants of total debt ratios as well as determinants of short-term debt and long-term debt ratios. Also, Dimitrios Vasiliou (2002), in his sample of 129 Greek firms listed in the Athens Stock

Exchange during the period 1997 – 2001, used total liabilities as a measure of debt ratio.

3.4.2.3 Control Variables

Two control variables are used: the natural logarithm of total sales (LnTS) and the stock price volatility. Total sales variable controls for firm size as suggested by the literature large companies may be able to borrow more than small companies. High stock price volatility necessitates careful evaluation of a firm's investment decisions. The reason for including this control variable is that stock price volatility encourages managers to reduce gearing in order to over-gearing. Stock Price volatility is a measure of a stock's average annual price movement to a high and low from a mean price for each year.

3.4.3 Book Value vs. Market Value

In general, the market value of either equity or assets is not the same as book value. Book value is based on the cost principle and reflects the cost of a transaction which has occurred or is reasonably certain to occur. Book value is an accounting number. Market value, on the other hand, represents the market's estimate of the value of assets or equity. Market value is forward looking; that is, market value reflects expectations about the future of the company. Market value and book value may differ because:

- Book value does not reflect reputation, brand names, customer loyalty
- Book value does not reflect expected future growth
- Book value does not reflect management talent
- Book value does not reflect the fact the whole is greater than the sum of the parts.

Empirical research typically relies on book rather than market value of debt, though theory is virtually always in terms of market values. A paper by Sweeney et al (1997) documents how book value measurements of debt distort debt-equity ratios and cost of capital calculations. In their paper, they focus on three key issues. First, mismeasurement can influence cross-sectional studies of capital structure, though the errors introduced may not be important because the cross-sectional correlation is very

high each month between book and market-based measures. Second, mismeasurement can influence time-series studies of capital structure; this influence can be quite important. Third, mismeasurement can importantly influence calculations of cost of capital.

Sweeney at al paper measures the market value of debt and assesses how using book value of debt as a proxy for market value of debt may have serious effects in empirical work. Book values sometimes, but not always, seriously mismeasure market values of debt. They focus on three key empirical issues to explore how the use of book values of debt affects empirical results. They find that mismeasurement can influence cross-sectional studies of capital structure that it can influence time-series studies of capital structure, and that calculating the costs of capital requires estimates of the value of debt.

In this paper, both book value and market value of equity will be used in order to recognize any difference that may arise as a result of one or more of the reasons mentioned above.

Table 3.1: Definition of the Data-stream Variables

Item	Not.	Description
392	BVTA	BVTA. The book value of total assets. This item is used to calculate Tobin's Q as well as to determine capital gearing.
305	BVE	Equity Capital and Reserves. This item is used in combination with BVTA to determine Tobin's Q.
MV	MV	Market value of equity. Is used together with 392 and 305 to determine Tobin's Q.
1301	TD	Total debt including long and short-term debt
306	PC	Preference capital. This item is added to item 1301 to determine company's overall debt.
NS	NS	The number of shares used in the calculation of market value of equity.
P	P	Is the market stock price used in combination with NS to calculate the market value of equity
Ln(104)	Ln(TS)	Natural logarithm of total sales. This item is used as a control variable for firm's size.
MG	MG	Market value of gearing calculated as TD (1301) + PC (306) to TD (1301) + PC (306) + MV.
BG	BG	Book value of gearing calculated as TD (1301) + PC (306) to BVTA (392).
TQ	TQ	Tobin's Q is the BVTA (392) + MV – BVE (305) to BVTA (392)
E002	Vol.	Stock Price volatility is a measure of a stock's average annual price movement to a high and low from a mean price for each year. This item is used as a control variable.

Source: Data-stream data items

3.5 Hypotheses test

The hypotheses will be tested using data and variables to give the regression analysis, the statistical package used will be "SPSS", and Cross Sectional design for the year 2002 will be used.

3.5.1 Results analysis

Data first will be tested to see whether it is normally distributed or not. If the variables are close to normality, then parametric test will be used. If variables are not normal, then they will be transformed in order to get them as close as possible to normal, since

parametric test can be used only if data is normal and parametric test provides more powerful results than non-parametric test which will be used if data fails to get close to normality. For normality, Regression analysis will be used. For non-normality, Chi-square will be used.

Regression Analysis is a statistical technique used to find relationships between variables for the purpose of predicting future values. In statistics, it is a mathematical method of modeling the relationships among three or more variables. It is used to predict the value of one variable given the values of the others. For example, a model might estimate sales based on age and gender. A regression analysis yields an equation that expresses the relationship.

A non-parametric test, like chi square, is a rough estimate of confidence; it accepts weaker, less accurate data as input than parametric tests and therefore has less status in the pantheon of statistical tests. Nonetheless, its limitations are also its strengths; because chi square is more 'forgiving' in the data it will accept, it can be used in a wide variety of research contexts

In this paper, regression analysis will be used to test the relationship between the dependent variables: stock price, ROA, and Tobin's Q and the independent variables: Debt-to-Equity ratio, Gearing ratio, and 2 control variables (Total Sales and Volatility).

3.5.2 "SPSS" (Statistical Package for the Social Sciences)

"SPSS" is a statistical package used extensively in marketing research. It provides over 50 statistical processes, including regression analysis, correlation and analysis of variance. Originally named Statistical Package for the Social Sciences, it was written by Norman Nie, a professor at Stanford. In 1976, he formed SPSS, Inc.

"SPSS" was chosen since it is widely used by many researchers and it gives a very advanced statistical analysis results.

3.5.3 Cross sectional vs. Time series analysis

Cross-sectional analysis studies relationship between different variables at a point in time, e.g. the relationship between income, locality, and personal expenditure. Unlike Time Series, Cross-sectional analysis concern about how variables affect each other at same time.

A Time Series is a sequence of data points, measured typically at successive times, spaced apart at uniform time intervals. Time series analysis accounts for the fact that data points taken over time may have an internal structure (such as autocorrelation, trend or seasonal variation) that should be accounted for.

Some empirical studies used the cross sectional analysis while other used the time series analysis to test capital structure effect on companies' performance. However, due to time constraint and since not all data are available for all years, cross sectional analysis will be used in this project for the year 2002.

3.6 Conclusion

The objective of this study is to see whether a certain level of Debt-to-Equity ratio will increase firms' performance. The null hypothesis to be rejected is that there is no relationship between capital structure and firms' performance. The market chosen is the UK and the companies are from the FTSE 350 listed firms. The sample size was reduced to 129 after excluding financial companies and other companies that do not have all data. Both book value and market value for equity are considered. Regression Analysis will be used to test the relationship between the dependent variables: stock price, ROA, and Tobin's q and the independent variables: gearing ratio, debt-to-equity ratio, and the 2 control variables (total sales and volatility). SPSS will be the statistical package used to test the regression analysis using cross sectional analysis of 2002 data.

Chapter 4: Findings and Analysis

As we have seen in chapter 3, the data are secondary from the FTSE 350 which is an index for the largest 350 firms in the UK. The size was reduced to 129 after excluding financial companies and other companies that have insufficient data. The dependent variables, which are a measure of companies' performance, are the stock price, ROA, and Tobin's Q. The independent variables, which are a measure of capital structure, are the Market Gearing, Book Gearing, and Book Debt-to-equity in addition of the 2 control variables (LnTS and stock Volatility).

4.1 Descriptive Statistics

Table 4.1: Descriptive Statistics of variables

	N	Minimum	Maximum	Mean	Median	Mode	Std. Deviation
Share Price	129	16.20	3287.50	364.16	278.33	155.83	364.44
ROA	129	-29.18	24.31	3.26	3.76	0.74	7.16
Tobin's Q	129	11.84	101.35	58.71	58.87	47.63	15.13
Book Gearing	129	0.00	366.33	53.68	41.06	0.00	54.40
MarketGearing	129	0.00	83.71	28.51	25.78	0.00	18.91
Book D-to-E	129	0.00	132.77	25.07	23.09	0.00	16.98
Ln (TS)	129	10.76	18.59	13.85	13.70	12.33	1.42
Volatility	129	20.20	64.31	33.49	31.87	29.62	7.93

Table 4.1 lists the descriptive statistics, using SPSS, for all the variables; number of observations, minimum, maximum, mean, Median, Mode, and standard deviation. Looking at the dependent variables which are a measure of companies' performance, i.e. Share Price, ROA, and Tobin's Q, we can realize that Tobin's Q is the most homogeneous variable and gives the most accurate results in the test. Tobin's Q is the ratio of the market value of a firm's assets to the replacement cost of the firm's assets. This measure of Q is likely to capture growth opportunities. Mean and Median for Tobin's Q are very close, 58.71 and 58.87 respectively indicating that the variable is normally distributed. Another way to interpret the results is graphically. Figure 4.1

displays the histogram and normal curve for Tobin's Q. Looking at the graph we can see also that data are normally distributed which justifies also our explanation in chapter 3 that Tobin's Q is a powerful variable since it captures both accounting and market measures.

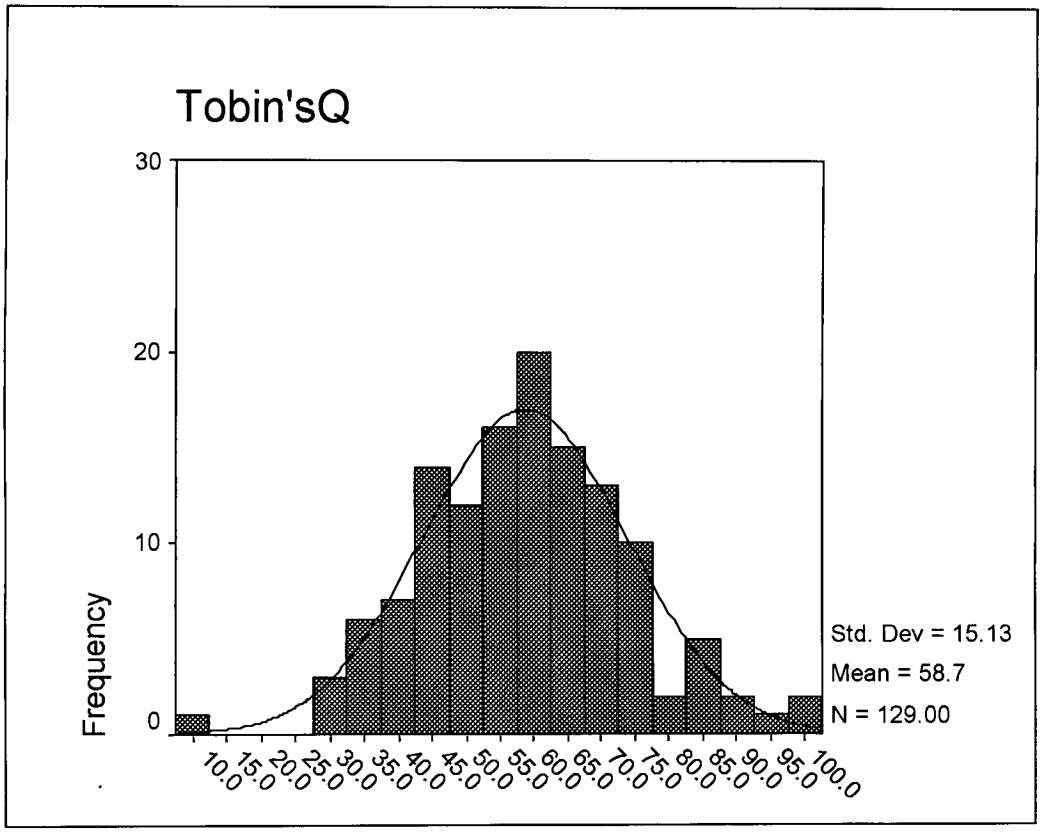


Figure 4.1: Tobin's Q

Share price was calculated by taking the average of eight weeks (four prior to the publication of the firm's annual profit and 4 weeks after) in order to avoid as much as possible the effect of announcing a firms' annual result on its stock price. As we have said in chapter 3 that stock price impound market expectations about a firm's future and thus may not be able to capture managers' current performance. It also may not be an efficient contracting parameter because it is driven by many factors beyond the control of the firms' executives. For this, share price is expected to be not very close to normality. The standard deviation of the Share Price is high reaching 364.4 with minimum price of 16.2 and maximum price of 3,287.5. The mode for share price is 155.83 and the median is 278.33. These values reflect also the difference in the stock price from industry to industry though we have taken the FTSE 350 sample with the

largest firms in the UK and data were supposed to be homogeneous. But looking at the curve in figure 4.2, we can say that share price is considered as close to normality.

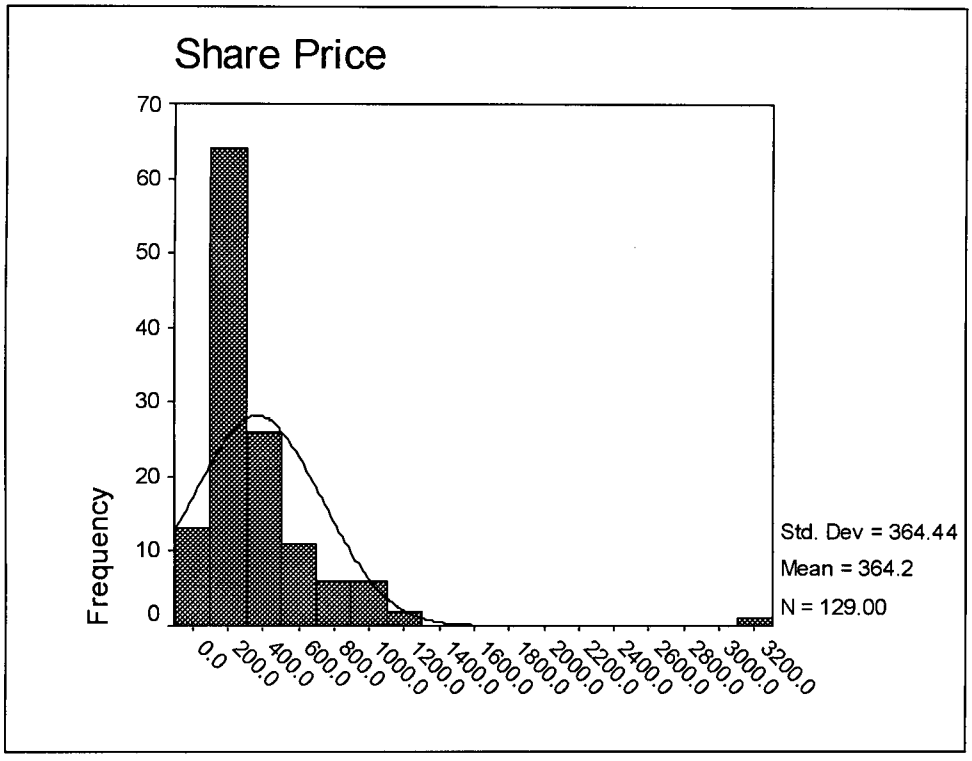


Figure 4.2: Share Price

Figure 4.3 below shows the histogram for ROA (return on assets). ROA is calculated by dividing a company's annual earnings by its total assets. As shown in table 4.1 that mean and median are very close, 3.26 and 3.76 respectively. Also, the curve implies that the variable is normally distributed though its weakness as mentioned in chapter 3 that ROA is an inadequate instrument because it ignores the cost of capital.

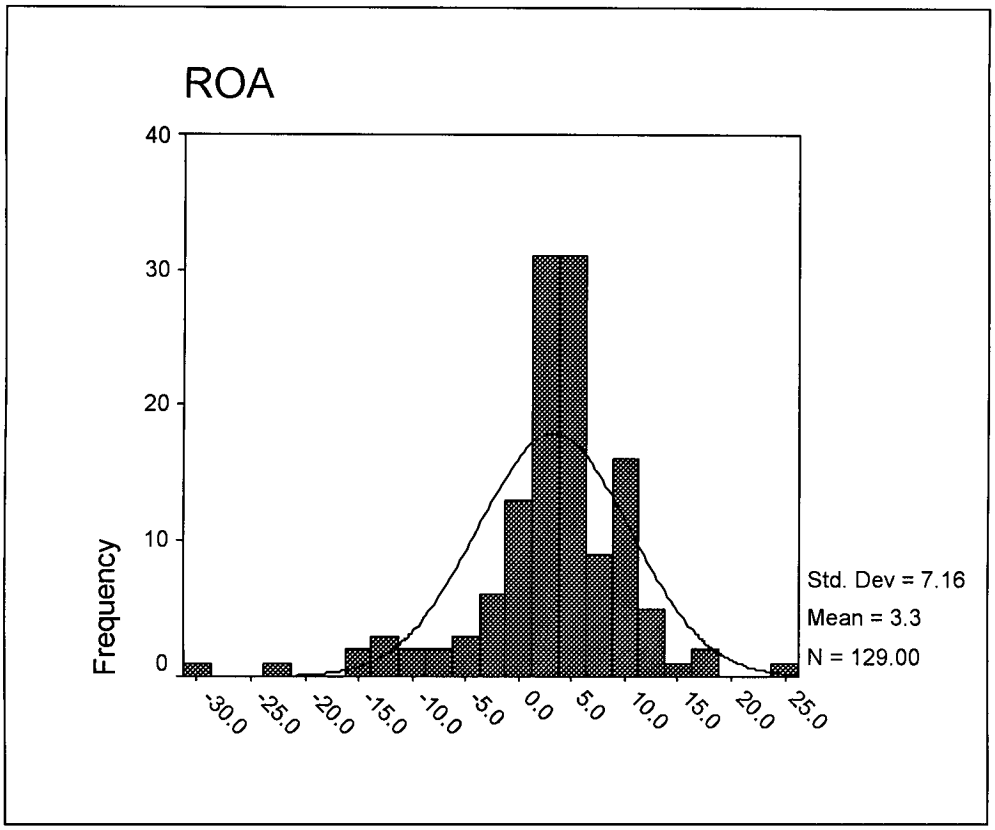


Figure 4.3: ROA

Comparing the independent variables, i.e. Book Gearing, Market Gearing, and Book Debt-to-Equity, we conclude that market gearing data are more homogenous and closer to normality than book gearing as shown in table 4.1. Market Gearing is the ratio of total debt plus preference share capital to total debt plus preference share capital plus the market value of the common stock. Book gearing variance is 2,959 while market gearing is only 357. Mean and Median for Book Gearing are 53.68 and 41.06 respectively while Mean and Median for Market Gearing are 28.51 and 25.78 respectively. Mean and Median are close to each other for Market Gearing than for Book Gearing indicating also that Market Gearing variables are more normally distributed or closer to normality. The curve in figure 4.4 below shows also that the data for market gearing are closer to normality than book gearing data.

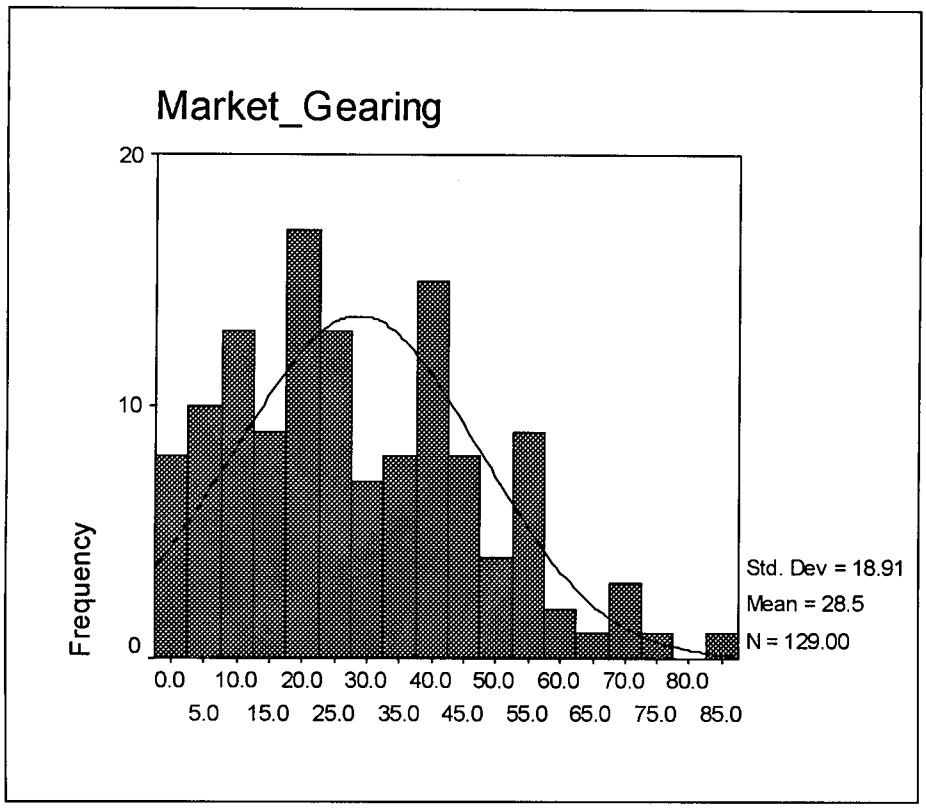


Figure 4.4: Market Gearing

Figure 4.5 shows the histogram and normal curve for Book Gearing ratio. This is the ratio of total debt plus preference share capital to total assets. From the figure, we can consider that data are close to normality.

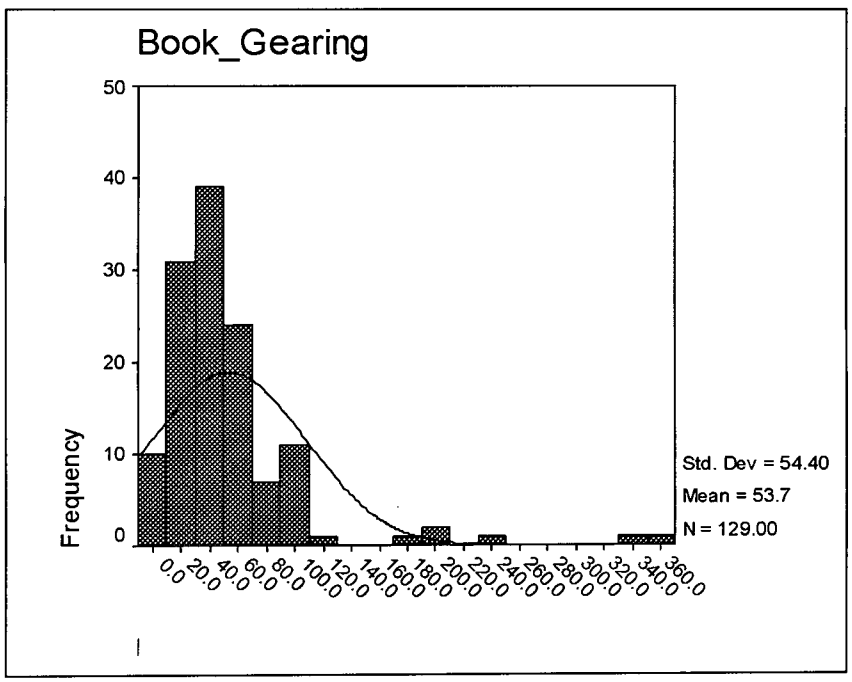


Figure 4.5: Book Gearing

Figure 4.6 shows the histogram and normal curve for Book Debt-to-Equity ratio. Debt-to-Equity is a measure of a company's financial leverage calculated by dividing long-term debt by stockholder equity. From table 4.1 and the curve in figure 4.6, it is obvious that Book Debt-to-Equity data are closer to normality than Book Gearing. Mean and Median are very close, 25.07 and 23.09 respectively.

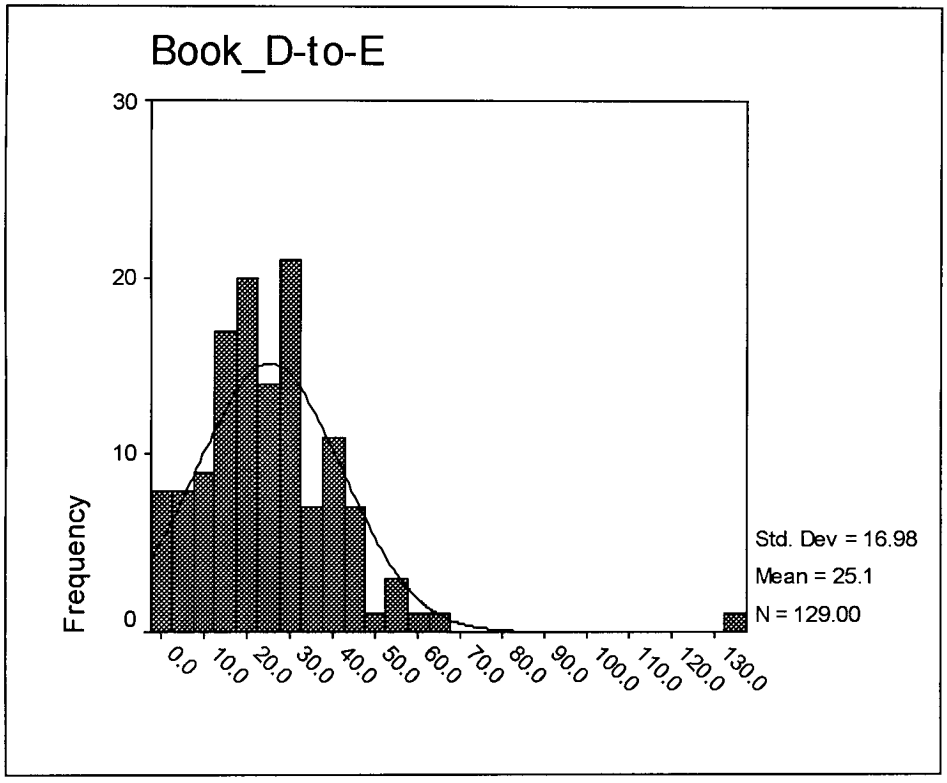


Figure 4.6: Book D/E

Figure 4.7 displays the histograms as well as the normal curve for Logarithm of Total Sales. Total sales variable controls for firm size as suggested by the literature large companies may be able to borrow more than small companies. Note that Logarithm for sales was effectively used to transform the data from being non-normal to become very close to normality. Mean and Median are very close, 13.85 and 13.70 respectively. The curve for this control variable implies that data are normally distributed.

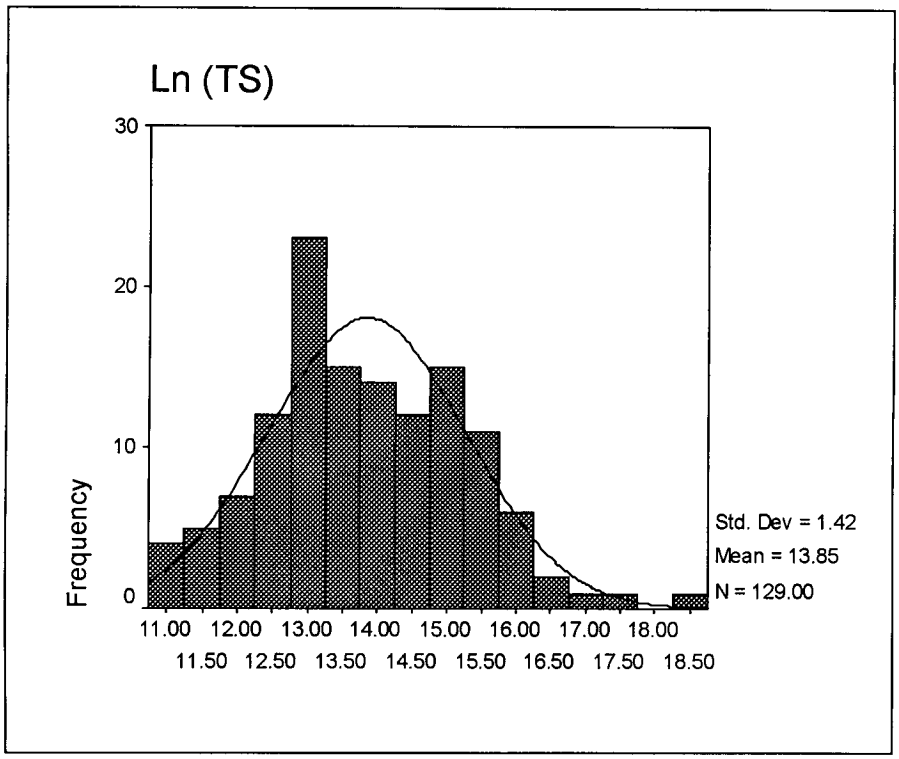


Figure 4.7: Ln (TS)

Figure 4.8 displays the histograms as well as the normal curve for stock price Volatility. Stock Price volatility is a measure of a stock's average annual price movement to a high and low from a mean price for each year. The curve for this second control variable indicates that data are close to normality.

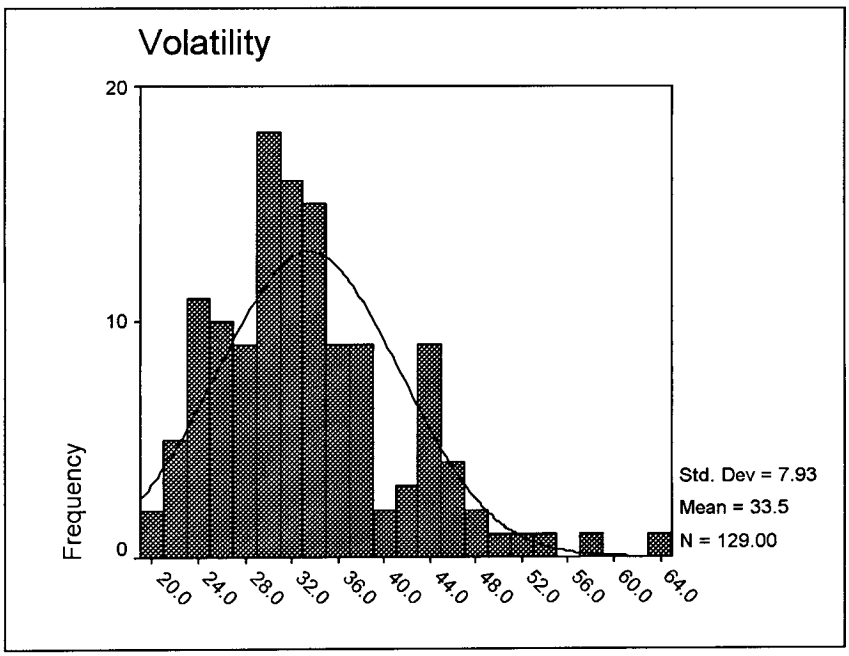


Figure 4.8: Volatility

In general, we can conclude from the above figures as well as from table 4.1 that the variables are normally distributed. Some are closer to normality than others; in the dependent variables Tobin's Q is the closest to normality while Share Price is the least and ROA is in between. In the independent variables, Market Gearing and Book Debt-to-Equity are closer to normality than Book Gearing. Since parametric tests provide more powerful results and all the variables are close to normality so we will assume that the variables satisfies the normality condition and parametric tests will be applied using regression analysis.

4.2 Regression Analysis

The following tables show the output results of the regression analysis performed on SPSS between each dependent and independent variable. (Detailed SPSS output are found in Appendix C)

Table 4.2: Regression analysis between Tobin's Q and Book Gearing + control variables

Dependent: Tobin's Q
Independent: Book Gearing, Ln (TS) & Volatility

Table 4.2.1: Coefficient Correlations

Correlations	Book Gearing	Ln (TS)	Volatility
Book Gearing	1.000	-0.029	-0.212
Ln (TS)	-0.029	1.000	0.198
Volatility	-0.212	0.198	1.000

Table 4.2.2: Model Summary

R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	Sig. F Change
0.398	0.384	11.876	0.398	27.600	0.000

Table 4.2.3: Coefficients

	Coefficients Beta	t-test	Sig.
Book Gearing	0.245	3.446	0.001
Ln (TS)	0.471	6.652	0.000
Volatility	0.39	5.383	0.000

Starting with Table 4.2, Regression analysis between Tobin's Q and Book Gearing + control variables (Ln (TS) and stock volatility), the Coefficient Correlations (table 4.2.1) show that correlation between variables is low implying that there is no problem of multicolinearity between selected variables. In addition, the model fits well with the variables with R Square = 0.398 (table 4.2.2) indicating that there is a strong positive relationship between firms' performance represented by Tobin's Q and capital structure represented by Book Gearing. The significance of the model (table 4.2.2) is 0.000 indicating that the selected variables contribute strongly in firms' performance. From table 4.2.3, the coefficient of book gearing is 0.245, t is 3.446 and the significant value of t is 0.001 indicating that book gearing has a strong contribution in firms' performance and a positive relationship exists between Tobin's Q and Book Gearing. As for the 2 control variables, results were good too and significant so they contribute also in firm's performance. These results lead us to reject the null hypothesis H_0 which predicts that there is no relationship between capital structure and firms'.

Table 4.3: Regression analysis between Tobin's Q and Market Gearing + control variables

Dependent: Tobin's Q
Independent: Market Gearing, Ln (TS) & Volatility

Table 4.3.1: Coefficient Correlations

Correlations	Market Gearing	Ln (TS)	Volatility
Market Gearing	1.000	-0.340	-0.362
Ln (TS)	-0.340	1.000	0.295
Volatility	-0.362	0.295	1.000

Table 4.3.2: Model Summary

R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	Sig. F Change
0.480	0.467	11.043	0.480	38.436	0.000

Table 4.3.3: Coefficients

	Coefficients Beta	t-test	Sig.
Market Gearing	0.414	5.770	0.000
Ln (TS)	0.341	4.869	0.000
Volatility	0.295	4.187	0.000

Table 4.3, displays the regression analysis between Tobin's Q and Market Gearing + control variables (Ln (TS) and stock volatility). Table 4.3.1 shows that there is no multicolinearity between selected variables. The table implies that there is a strong positive relationship between Tobin's Q and Market Gearing, even stronger than that with Book Gearing with R Square = 0.48. The significance of the model as well as for each variable is 0.000 indicating that the selected variables contribute strongly in firms' performance. Coefficient of Market Gearing is 0.414 which is very interesting and has strong contributions in companies' performance. These results lead us to reject the null hypothesis H_0 which predicts that there is no relationship between capital structure and firms' performance. Note that Market Gearing gave better results than Book Gearing, coefficient of Market gearing is 0.414 while for Book gearing is 0.245. This result was expected and mentioned in chapter 3 that researchers prefer it on book gearing. For instance, Myers (1977) argues that market values incorporate the present values of future growth opportunities.

Table 4.4: Regression analysis between Tobin's Q and Book D/E + control variables

Dependent: Tobin's Q
Independent: Book Debt-to-Equity, Ln (TS) & Volatility

Table 4.4.1: Coefficient Correlations

Correlations	Book Debt to Equity	Ln (TS)	Volatility
Book Debt to Equity	1.000	-0.213	-0.215
Ln (TS)	-0.213	1.000	0.233
Volatility	-0.215	0.233	1.000

Table 4.4.2: Model Summary

R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	Sig. F Change
0.501	0.489	10.812	0.501	41.898	0.000

Table 4.4.3: Coefficients

	Coefficients Beta	t-test	Sig.
Book Debt to Equity	0.416	6.335	0.000
Ln (TS)	0.389	5.901	0.000
Volatility	0.353	5.349	0.000

From table 4.4, it is obvious that the strongest positive relationship between firms' performance represented by Tobin's Q and capital structure represented by Book Debt-to-Equity is realized. R Square is 0.5 and the significance of the model is at 0% level. The significance of the t-test for each variable is 0.000 indicating that the selected variables mainly Book Debt-to-Equity has the strongest contributions in firms' performance. These results lead us to reject the null hypothesis H_0 which predicts that there is no relationship between capital structure and firms' performance.

Table 4.5: Regression analysis between Share Price and Book Gearing + control variables

Dependent: Share Price
Independent: Book Gearing, Ln (TS) & Volatility

Table 4.5.1: Coefficient Correlations

Correlations	Book Gearing	Ln (TS)	Volatility
Book Gearing	1.000	-0.029	-0.212
Ln (TS)	-0.029	1.000	0.198
Volatility	-0.212	0.198	1.000

Table 4.5.2: Model Summary

R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	Sig. F Change
0.118	0.097	346.310	0.118	5.583	0.001

Table 4.5.3: Coefficients

	Coefficients Beta	t-test	Sig.
Book Gearing	-0.021	-0.240	0.811
Ln (TS)	0.000	-0.004	0.996
Volatility	-0.339	-3.866	0.000

From table 4.5, we can say that the relationship between Share Price and Book Gearing is weak; R square is only 0.118 comparing with above results. The Coefficient of Book Gearing is very low -0.021 and the significance of the t-test is very high at 81% above our acceptable level of 10%. Share price was expected to be insignificant since it does not reflect current management decisions, as mentioned in chapter 3, for this it is a weak measure of capital performance. All these results lead us not to accept this model.

Table 4.6: Regression analysis between Share Price and Market Gearing + control variables

Dependent: Share Price
Independent: Market Gearing, Ln (TS) & Volatility

Table 4.6.1: Coefficient Correlations

Correlations	Market Gearing	Ln (TS)	Volatility
Market Gearing	1.000	-0.340	-0.362
Ln (TS)	-0.340	1.000	0.295
Volatility	-0.362	0.295	1.000

Table 4.6.2: Model Summary

R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	Sig. F Change
0.201	0.182	329.609	0.201	10.493	0.000

Table 4.6.3: Coefficients

	Coefficients Beta	t-test	Sig.
Market Gearing	-0.321	-3.613	0.000
Ln (TS)	0.106	1.218	0.226
Volatility	-0.229	-2.621	0.010

From table 4.6, we can say that there is a weak relationship between Share Price and the independent variables, R square is only 0.2. The coefficient of Market Gearing is negative which is insignificant so the model is weak and not acceptable. Note that the coefficient of Volatility is negative which is expected since it is directly linked to share price so as volatility increases the share would be risky and in turns its price would decrease.

Table 4.7: Regression analysis between Share Price and Book D/E + control variables

Dependent: Share Price
Independent: Book Debt-to-Equity, Ln (TS) & Volatility

Table 4.7.1: Coefficient Correlations

Correlations	Book Debt-to-Equity	Ln (TS)	Volatility
Book Debt-to-Equity	1.000	-0.213	-0.215
Ln (TS)	-0.213	1.000	0.233
Volatility	-0.215	0.233	1.000

Table 4.7.2: Model Summary

R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	Sig. F Change
0.137	0.117	342.529	0.137	6.632	0.000

Table 4.7.3: Coefficients

	Coefficients Beta	t-test	Sig.
Book Debt-to-Equity	-0.145	-1.683	0.095
Ln (TS)	0.030	0.347	0.729
Volatility	-0.312	-3.596	0.000

From table 4.7, we can say that the relationship between Share Price and Book Debt-to-Equity is weak. R square is only 0.137 and Coefficient of Book D/E is -0.145. For this, the model is weak in representing the relation between capital structure and firms' performance. From the above three regressions, we can say that Share Price has is a weak measure of firms' performance as expected, since share price doesn't reflect current management decisions.

Table 4.8: Regression analysis between ROA and Book Gearing + control variables

Dependent: ROA
Independent: Book Gearing, Ln (TS) & Volatility

Table 4.8.1: Coefficient Correlations

Correlations	Book Gearing	Ln (TS)	Volatility
Book Gearing	1.000	-0.029	-0.212
Ln (TS)	-0.029	1.000	0.198
Volatility	-0.212	0.198	1.000

Table 4.8.2: Model Summary

R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	Sig. F Change
0.045	0.022	7.082	0.045	1.976	0.121

Table 4.8.3: Coefficients

	Coefficients Beta	t-test	Sig.
Book Gearing	0.166	1.855	0.066
Ln (TS)	0.132	1.477	0.142
Volatility	0.024	0.260	0.795

Table 4.8 shows that the relationship between ROA and Book Gearing is weak with R square only 0.045. The coefficient of Book Gearing is 0.166 and significant at 6.6% indicating that Book Gearing has contributions in companies' performance. We conclude that the relationship between ROA and Book Gearing is weak since ROA has its limitations as mentioned in chapter 3; ROA ignores the cost of capital motivating dysfunctional behavior causing managers to pay attention to the "wrong" things.

Table 4.9: Regression analysis between ROA and Market Gearing + control variables

Dependent: ROA
Independent: Market Gearing, Ln (TS) & Volatility

Table 4.9.1: Coefficient Correlations

Correlations	Market Gearing	Ln (TS)	Volatility
Market Gearing	1.000	-0.340	-0.362
Ln (TS)	-0.340	1.000	0.295
Volatility	-0.362	0.295	1.000

Table 4.9.2: Model Summary

R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	Sig. F Change
0.028	0.005	7.146	0.028	1.205	0.311

Table 4.9.3: Coefficients

	Coefficients Beta	t-test	Sig.
Market Gearing	0.106	1.082	0.281
Ln (TS)	0.101	1.059	0.292
Volatility	0.022	0.227	0.821

Table 4.9 shows that there is a weak positive relationship between capital structure and firms' performance. The relationship between ROA and Market Gearing is weak with R square only 0.028. The coefficient of Book Gearing is 0.106 and the significance of the t-test is high at 28% which is above our accepted level of 10%. The significance of the model is also high at 31%. ROA is a weak measure of companies' performance since it has some limitations as mentioned before.

Table 4.10: Regression analysis between ROA and Book D/E + control variables

Dependent: ROA
Independent: Book Debt to Equity, Ln (TS) & Volatility

Table 4.10.1: Coefficient Correlations

Correlations	Book Debt-to-Equity	Ln (TS)	Volatility
Book Debt-to-Equity	1.000	-0.213	-0.215
Ln (TS)	-0.213	1.000	0.233
Volatility	-0.215	0.233	1.000

Table 4.10.2: Model Summary

R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	Sig. F Change
0.023	-0.001	7.165	0.023	0.977	0.406

Table 4.10.3: Coefficients

	Coefficients Beta	t-test	Sig.
Book Debt-to-Equity	0.065	0.709	0.480
Ln (TS)	0.123	1.328	0.186
Volatility	0.046	0.493	0.623

Table 4.9 shows that the relation between ROA and Book Debt-to-Equity is also weak with R square only 0.023. The significance of the model is at 40% level, very high. The coefficient of Book Gearing is positive and very low indicating a weak positive relationship between Book Debt-to-Equity and ROA. The above three tables for the regression analysis between ROA and capital structure variables, i.e. Book Gearing, Market Gearing, and Book Debt to Equity, implies that there exists a weak positive relationship between ROA and the independent variables. In addition, ROA as expected is a weak measure of companies' performance since it has its limitations mentioned before that it doesn't take into consideration the cost of capital.

4.3 Conclusions

In general, we conclude from the above tables and figures that the variables are normally distributed. Some are closer to normality than others; in the dependent variables Tobin's Q is the best measure of companies' performance since it captures both accounting and market measures. Share Price is a weak measure for firm's performance, as expected, since it doesn't reflect current management decisions. ROA also has its limitations since it does not take into consideration the cost of capital motivating dysfunctional behavior causing managers to pay attention to the "wrong" things.

From the regressions analysis, we can say that Tobin's Q is the best measure of firms' performance and there exists a strong positive relationship between firms' performance measured by Tobin's Q and Capital Structure variables measured by Book Gearing, Market Gearing, and Book Debt-to-Equity. In addition, the strongest positive relationship between firms' performance and capital structure is realized between Tobin's Q and Book Debt-to-Equity. Note that Market Gearing gave better results than Book Gearing, as expected and mentioned in chapter 3, for instance it was used by many researchers like Myers (1977) who argues that market values incorporate the present values of future growth opportunities. As expected, Share Price and ROA are weak measures of firms' performance because of their limitations mentioned above. Overall, the regressions analysis lead us to reject the null hypothesis H_0 which predicts that there is no relationship between capital structure and firms' performance and to accept the alternative H_1 which predicts that there is a relationship between capital structure and firms' performance and indeed a strong positive relationship exists between leverage and firms' performance.

Our empirical evidence, a significant positive relationship exists between capital structure and firms' performance, is in line with the Trade-off theory, Agency theory, and signalling theory. The Trade-off theory which predicts that leverage will increase firms' performance. So, as the level of debt increases, firms' performance will increase too but, up to a certain level since debt is risky. So, the theory states that firms trade-off the benefits of debt financing against the higher interest rates and bankruptcy costs. The Agency theory is the analysis of the conflict that arises between corporate managers and

shareholders. Shareholders delegate decision-making authority to managers who may not pay the costs or reap the benefits of their decisions. So, managers increase the level of debt in order to increase their returns and profits however, bankruptcy risk will increase and is bared mainly by shareholders. The Signalling theory predicts that management should issue debt in order to give good signal to the market about their firm's performance. Signal is an action taken by a firm's management that provided clues to investors about how management views the firm's prospects. Accordingly, the announcement of a stock offering is generally taken as a signal that the firm's prospects as seen by its management are not bright. All these theories are in accordance with our empirical study that increasing debt has some benefits and will increase companies' performance.

Our empirical evidence contradicts MM theory 1958, MM 1963, and the Pecking order model. The Modigliani and Miller theorem states that the value of a company is unaffected by its capital structure decisions. MM theory implies that the capital structure of a firm is a matter of indifference and that consequently, one of the core problems of corporate finance, the problem of the optimal capital structure for a firm, is no problem at all. However, in our empirical study we realized that a strong relationship exists between capital structure and firms' performance, more precisely a positive relationship exists between leverage and firms' performance. Modigliani and Miller theory in 1963 implies that introducing corporate taxes into the model creates tax shield benefits to debt. So, MM suggested a 100% use of debt while in our empirical study we found that a moderate use of debt, as shown in table 4.1 that the average ratio of debt measures was less than 50%, has a positive relationship with firms' performance. The pecking order model predicts that internal financing, i.e. using retained earnings is always better than external financing, i.e. issuing debt or equity. This theory contradicts our empirical study that debt has advantages and increase companies' performance.

To conclude, our empirical results lead us to reject the null hypothesis H_0 which predicts that there is no relationship between capital structure and firms' performance and to accept the alternative H_1 which predicts that there is a relationship between capital structure and firms' performance.

Chapter 5: Conclusions and Recommendations

5.1 Introduction

The theory of capital structure has been dominated by the search for optimal capital structure. Optimums normally require a trade-off between the tax advantages of borrowed money and the costs of financial distress (bankruptcy costs) when the firm finds it has borrowed too much. Debt is a cheaper source of fund than equity (issuing stocks) but debt is risky. In the real world, companies do not generally raise their debt-to-equity ratios to very high levels. This suggests that there are other important influences on capital structure besides lower costs of debt and tax relief on debt. The basic additional factors which have a bearing on the gearing level are: financial distress (bankruptcy costs); agency costs; borrowing capacity; managerial preference; pecking order; financial slack; and signalling. Understanding all these will help us to achieve a link between companies' performance and the level of debt-to-equity.

Many interesting questions have been raised over the years: Is there really an optimal capital structure for any individual firm or industry? Does that ratio stay constant over time? Why do leverage-altering transactions (stock and/or debt offerings, swaps, buy-backs) have such consistent effects on firm stock price? Although most of the literature on the topic points to the existence of optimal capital structures, no one theory has emerged to explain all these phenomena

This chapter reviews the significance of the previous chapters' findings in light of the theories and empirical research elaborated in the literature review. Data collection and variables will be discussed. The managerial implications of the results are discussed and the limitations of the study a well as proposals for further research will be presented. This chapter concludes with the relevance of managing capital structure.

5.2 Summary of Chapters

Chapter 2, literature review, discusses the most influential theories about capital structure and financing decisions. All mentioned theories failed to reach a universal consensus on optimal financing structure. The influential work in this area was by Modigliani and Miller (1958). MM showed that with perfect markets and without taxes, the total value of a firm is independent of its debt/equity ratio. Similarly, they proved that the value of the firm is independent of the level of dividends. In their framework, it is the investment decisions of the firm that are important in determining its total value.

The existence of a tax advantage for debt financing does not necessarily mean that corporations should at all times seek to use the maximum possible amount of debt in their capital structures. For one thing, other forms of financing, notably retained earnings, may in some circumstances be cheaper. More important, there are limitations imposed by lenders. These additional considerations imply the maintenance by the corporation of a substantial reserve of untapped borrowing power. The tax advantage of debt may well tend to lower the optimal size of that reserve. All of these led to the Trade-Off theory of capital structure. Some debt is desirable because of the tax shield arising from interest deductibility, but the costs of bankruptcy and financial distress limit the amount that should be used. Moreover, debt, from the agency's point of view, is preferable since it reduces the agency cost between managers and shareholders. However, as the level of debt increases the agency problem between bondholders and shareholders increase. For this, the result is a trade-off between debt and equity.

The tax advantage of debt, relative to the magnitude of expected bankruptcy costs, would seem to imply that firms should use more debt than is actually observed. Miller (1977) attempt to explain this was not successful. In Miller model, there is a personal tax advantage to equity because capital gains are only taxed on realization and a corporate tax advantage to debt because interest is tax deductible. In equilibrium, people with personal tax rates above the corporate tax rate, hold equity while those with rates below, hold debt. However, these predictions were not consistent with what happened in reality.

Myers and Majluf (1984) assume that a potential purchaser of securities has less information about the prospects of the firm than management, and that management is more likely to issue securities when the market price of the firm's traded securities is higher than management's assessment of their value. Sophisticated investors revise their estimate of the value of the firm if management announces a new security issue; furthermore, the larger the potential disparity in information, the greater the revision in expectations and the larger the negative price reaction to the announcement of a new issue. This information gap has at least two potential consequences for the capital structure debate. The first is the possible existence of a financial pecking order firms may follow when financing new projects. The second involves the various signals companies can send to the market with different financial transactions.

The Pecking Order hypothesis predicts that if company insiders happen to believe the firm's stock has been underpriced in the market, they will hesitate to issue new stock, even for a positive NPV project. Underpricing the equity may lead new buyers to gain more than the NPV of the new project, at the expense of current shareholders. The company would much rather finance the project with retained earnings or riskless debt, both of which will not be undervalued.

There is much room for improvement in the explanatory and predictive ability of capital structure theories. It is obvious that none of the theories has reached a target debt-to-equity ratio for an optimal capital structure. That is why the objective of my empirical study was to test the relationship between debt-to-equity ratios and companies performance.

Chapter 3 mentions data collection as well as dependent and independent variables. The data are secondary from the FTSE 350 which is an index for the largest 350 firms in the UK. The size was reduced to 129 after excluding financial companies and other companies that have insufficient data. The null hypothesis H_0 predicts that there is no relationship between capital structure and firms' performance. The dependent variables, which are a measure of companies' performance, are the stock price, ROA, and Tobin's Q. The independent variables, which are a measure of capital structure, are the Market Gearing, Book Gearing, and Book Debt-to-equity in addition of the 2 control variables (LnTS and stock Volatility).

Chapter 4, findings and analysis, concludes that the variables are normally distributed. Some are closer to normality than others; in the dependent variables Tobin's Q is the best measure of companies' performance since it captures both accounting and market measures. Share Price is a weak measure for firm's performance, as expected, since it doesn't reflect current management decisions. ROA also has its limitations since it does not take into consideration the cost of capital. The descriptive statistics show that the mean for the companies represented in the sample has relatively moderate debt ratios. From the regressions analysis, we can say that a strong positive relationship exists between Tobin's Q and Capital Structure variables, i.e. Book Gearing, Market Gearing, and Book Debt-to-Equity. Overall, the regressions analysis led us to reject the null hypothesis H_0 which predicts that there is no relationship between capital structure and firms' performance.

5.3 Contributions and Managerial Implications

Our empirical evidence, a positive relationship exists between capital structure and firms' performance, is in line with the Trade-off theory which predicts that leverage will increase firms' performance but up to a certain level since debt is risky. So, firms trade-off the benefits of debt financing against the higher interest rates and bankruptcy costs. Our empirical evidence supports also the Agency theory which states that the conflict between managers and shareholders is mainly due to the fact that managers increase the level of debt in order to increase their returns and profits, however, bankruptcy risk will increase and is bared mainly by shareholders. Our evidence supports, as well, the Signalling theory which predicts that management should issue debt in order to give good signal to the market about their firm's performance.

Our empirical evidence contradicts MM theory 1958 which states that the capital structure of a firm is a matter of indifference and that consequently, one of the core problems of corporate finance, the problem of the optimal capital structure for a firm, is no problem at all. Our evidence contradicts also MM theory 1963 which implies that introducing corporate taxes into the model creates tax shield benefits to debt; so, the theory suggested a 100% use of debt. Our empirical evidence contradicts, as well, the Pecking order model which predicts that internal financing, i.e. using retained earnings,

is always better than external financing, i.e. issuing debt or equity and if to use external financing, always debt is used and never equity.

Companies with relatively high levels of debt in their capital structure perform better than those with lower debt levels. However, gearing increases risk as well as returns. If a recession occurs and debt repayments cannot be met, insolvency of the company is possible. A manageable level of debt bestows tax benefits and increases shareholders' returns, without unnecessarily risking insolvency.

Managers should seek opportunities to diversify their operations, and the composition of their assets, as this will reduce the risk of poor performance associated with bad economic conditions that can affect a single industry sector. Capital structure decisions require ongoing optimal trade-off between maximizing the long-term value of a firm and minimizing the cost of capital. However, management must be sensitive to factors such as the need to have unused good debt capacity during downturns in the economic cycle to take advantage of opportunities and of particular needs which may exist during recessions in an economy.

This optimal capital structure is a function of several variables including the business risk of a company and the tax rate: the higher the tax rate, the greater the benefits of using a given amount of debt. The lower the company's business risks, the greater debt proportion it should use in its financial structure; conversely, the higher the company's business risks, the lesser the debt proportion it should use in its financial structure. It is dangerous to combine high gearing with high business risk or low profitability. Management must look carefully at the stability of profits and cash flow stream before committing to too much debt.

This study contributes to the literature by providing evidence that supports the positive relationship between profitability and capital structure. Debt, up to a moderate level, increases firms' performance. To conclude, the results indicate that capital structure does have effect on firms' performance.

5.4 Limitations of this Project

The study was going to be made at first on the Middle East since none of the empirical studies on capital structure was performed on this area. During my research, all of the studies were performed on the USA. However, I could not find information for the Middle East market since I required financial data for listed companies and that market is very primitive and small, so financial information are not easily accessed.

Financial companies were excluded from the study since in each country there are specific regulations from the central bank and other regulators that regulate the capital of financial companies. In addition, there is the BASEL I and II agreements that regulate banks' capital and enforce them to increase capital to a certain level to minimize risks. Market Debt-to-Equity was excluded also from the independent variables since the ratios were not available for all companies.

Sample size was reduced to 129 firms out of 350 listed firms in the FTSE 350 due to the unavailability of many ratios for the omitted firms. Of course, a sample of 350 firms might have given more accurate results.

Using cross-sectional design for the purposes of this project may also indicate some limitations, as most of the companies' profit level and especially debt level can change considerably over time. But due to unavailability of all data for the same years, cross sectional analysis was used instead of times series.

5.5 Recommendations

Capital structure decisions offer important opportunities to create value for shareholders and in light of the findings and limitations of this study, the following further research is suggested:

- This research inspected the relationship between capital structure and financial performance for the FTSE 350 companies in the UK as a cross-sectional design. The same relationship can be examined by using a time serious analysis. Data

relating to all the companies' capital structure and financial performance ratios could be examined for a period such as 4 or more years rather than a single point in time.

- In this project, the sample was the FTSE 350 which is an index for the largest 350 firms in the UK. The size was reduced to 129 firms after eliminating financial companies and companies that do not have all required ratios. A further study can be applied on medium and small size firms and compares the results.

- The UK is a matured market with well developed stock exchanges; in addition, it is a developed country. A similar study can be performed on an emerging market whereby the stock exchange is not so developed or on an underdeveloped country.

Firms should embrace the shareholders' value creation approach. Value is only created when the return on the assets of a company is superior to the cost of financing those assets. This study has pointed out the relationship between capital structure and companies' performance for the FTSE 350 in such a way that as company's debt increases (up to a moderate level), so does performance, and shareholders value is maximized. To conclude, this study prompts for the adoption of management strategy for capital structure.

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Appendix A: FTSE 350 data

	Name	Share Price	ROA	TQ	Book Gearing	Market Gearing	Book D/E	Ln(TS)	Volatility
C1	BG Group	255.00	-0.85	50.96	25.02	11.48	18.15	14.77	24.19
C2	BP	422.75	6.07	56.48	20.71	12.53	13.84	18.59	22.17
C3	Hunting	91.00	4.60	67.94	53.9	26.67	32.79	13.77	38.21
C4	Premier Oil	278.75	5.72	59.59	48.13	41.89	42.14	12.20	43.11
C5	Andrews Sykes Group	132.25	0.86	71.15	57.65	15.27	41.03	11.16	45.86
C6	BPP Holdings	242.50	3.72	52.77	28.24	10.31	14.47	11.57	33.21
C7	Bunzl	403.50	3.22	59.45	48.66	14.40	22.30	14.80	26.16
C8	Davis Service Group	294.75	2.65	60.96	73.55	44.00	38.85	13.61	23.60
C9	De La Rue	456.67	6.30	45.82	11.41	6.13	6.45	13.39	36.17
C10	Electrocomponents	469.83	3.24	37.75	25.4	5.61	11.14	13.54	29.40
C11	Interserve	183.75	3.45	65.38	44.78	22.90	9.57	13.91	27.49
C12	Jarvis	282.25	5.48	68.01	63.04	24.17	20.40	13.72	64.31
C13	Johnson Service Group	287.50	18.39	53.01	60.8	26.53	27.36	12.30	24.20
C14	Laing (John)	116.75	-6.76	72.28	65.01	71.26	55.74	13.23	53.41
C15	MITIE Group	149.00	4.13	62.08	0.08	0.02	0.03	13.16	30.76
C16	Premier Farnell	299.33	9.36	80.42	203.52	52.18	132.77	13.60	43.28
C17	RAC	399.00	24.31	68.16	95.59	43.71	24.62	14.01	34.28
C18	REXAM	404.50	4.35	72.79	87.35	44.81	42.19	14.94	30.83
C19	Serco Group	168.25	13.40	62.02	38.06	12.53	13.53	13.91	32.35
C20	Reuters Group	206.25	9.42	84.88	72.98	23.80	24.33	15.09	38.87
C21	Johnston Press	371.00	4.19	51.77	335.37	33.03	44.29	12.97	30.53
C22	Capital Radio	515.83	4.96	30.35	366.33	6.81	14.38	11.70	40.98
C23	Carlton Communications	127.08	4.03	77.13	100.13	56.60	62.19	13.78	43.83
C24	Scottish Radio Holdings	575.00	-3.33	37.38	104.54	18.15	27.53	11.16	36.98
C25	Ulster Television	323.75	9.51	67.76	247.34	18.47	45.16	10.76	34.30
C26	AGA Foodservice	205.50	3.53	36.70	12.3	8.08	5.46	12.71	31.75
C27	Bodycote International	96.00	2.21	52.95	49.86	57.24	33.52	12.99	36.70
C28	FKI	173.17	0.74	72.08	93.85	55.80	37.91	14.29	36.94
C29	Halma	155.83	16.32	32.48	10.97	3.59	6.46	12.50	28.60
C30	IMI	269.63	-3.55	58.37	42.49	20.98	19.58	14.29	30.32
C31	Morgan Crucible	56.75	4.59	66.08	50.77	73.85	34.09	13.69	33.34
C32	Senior	22.13	1.45	60.62	72.58	57.81	32.85	12.90	44.95
C33	Vitec Group	303.75	0.87	54.44	29.79	19.74	20.32	12.11	26.68
C34	Weir Group	215.00	0.89	72.60	41.42	25.99	23.03	13.46	32.58
C35	Metalrax Group	69.63	-12.47	33.55	0.54	0.32	0.34	11.62	20.66
C36	Rotork	288.75	-11.47	33.01	0.73	0.15	0.36	11.80	25.42
C37	SpiraxSarco Engineering	402.00	-1.66	47.28	27.93	16.22	21.42	12.60	29.62
C38	Shanks Group	170.17	1.96	77.78	92.09	55.12	46.28	13.18	33.68
C39	Huntleigh Technology	296.50	-12.38	49.99	40.07	21.01	28.62	12.08	30.26
C40	Smith & Nephew	378.50	2.55	58.35	52.27	8.22	25.65	13.92	23.88
C41	Whatman	81.50	-0.83	47.43	18.71	10.46	13.05	11.38	46.18
C42	Lonmin	866.17	-15.31	50.62	15.34	8.88	13.87	13.07	34.63
C43	Rio Tinto	1271.00	5.66	63.09	36.07	22.29	30.13	15.54	29.39
C44	GKN	219.88	3.56	70.99	52.4	38.96	28.72	15.01	28.97
C45	N. Brown Group	259.67	-8.80	47.23	31.96	20.09	24.15	13.01	31.82
C46	Findel	307.83	-9.39	63.45	59.12	33.33	35.89	12.74	38.31
C47	French Connection	793.33	-3.18	71.15	28.44	9.59	15.04	12.33	43.61
C48	Next	927.17	9.19	44.94	1.25	0.34	0.75	14.44	31.45
C49	Smith (W.H.)	347.25	4.57	46.06	12.28	5.95	4.95	14.89	31.87

	Name	Share Price	ROA	TQ	Book Gearing	Market Gearing	Book D/E	Ln(TS)	Volatility
C50	Big Food Group	59.50	0.76	73.39	90.33	69.32	29.48	15.47	46.99
C51	Boots Group	673.83	-5.90	47.63	22.16	10.12	14.45	15.49	22.06
C52	Greggs	3287.50	-14.33	39.68	0	0.00	0.00	12.95	22.63
C53	GUS	671.33	4.16	56.82	61.4	20.95	27.58	15.68	27.55
C54	Kingfisher	288.82	13.39	65.72	35.05	21.68	22.32	16.09	31.26
C55	Marks & Spencer	386.63	4.38	57.27	49.28	28.31	40.65	15.85	24.41
C56	Morrison(WM) Supermarket	201.25	-6.15	37.64	6.73	2.41	4.69	15.18	24.77
C57	Mothercare	228.50	1.27	36.12	0	0.00	0.00	12.96	43.16
C58	Safeway	305.58	5.44	56.49	36.55	37.49	27.52	15.96	28.12
C59	Sainsbury, J	405.92	7.64	56.26	42.23	39.77	32.20	16.66	25.96
C60	Tesco	242.58	10.90	59.31	41.96	23.54	31.20	16.98	22.85
C61	Courts	266.17	16.21	72.77	48.52	71.32	40.56	13.46	32.03
C62	Wyevale Garden Centres	382.25	9.43	54.39	57.62	41.45	42.64	12.08	24.88
C63	Reckitt Benckiser	1161.00	2.34	65.98	108.18	5.87	15.09	15.08	26.89
C64	Inchcape	724.38	10.85	68.36	17.05	13.30	6.99	15.04	37.63
C65	Aggregate Industries	77.13	9.09	52.85	41.06	37.64	30.80	14.14	35.71
C66	BPB	375.83	-21.31	54.70	34.13	26.59	23.31	14.32	34.98
C67	Hanson	300.00	3.45	60.89	49.74	55.70	37.56	15.10	27.03
C68	Heywood Williams Group	129.50	3.06	60.70	40.08	37.77	19.77	13.31	36.23
C69	Marshalls	278.33	9.57	34.73	11.76	6.76	8.48	12.74	30.00
C70	Pilkington	110.50	2.37	73.62	36.71	51.07	27.64	14.72	37.78
C71	RMC Group	394.00	10.09	64.23	40.06	57.35	27.24	15.32	30.94
C72	AMEC	165.63	5.35	84.57	61.59	39.39	17.19	14.98	43.70
C73	Balfour Beatty	154.88	12.00	87.82	206.92	30.64	17.03	14.95	44.24
C74	Countryside Properties	175.33	4.60	62.55	33.56	37.57	21.16	12.99	38.53
C75	McAlpine (Alfred)	243.25	0.62	45.67	6.28	4.76	2.29	13.55	37.31
C76	Mowlem	122.75	10.52	76.47	25.5	19.97	4.96	14.47	45.59
C77	Persimmon	420.00	-29.18	46.92	32.12	22.66	19.81	14.35	34.88
C78	Westbury	298.50	12.44	47.93	21.32	21.23	13.36	13.24	30.62
C79	Wilson Bowden	763.25	4.59	46.91	15.56	14.90	9.79	13.80	28.58
C80	Wilson Connolly	145.00	-3.46	53.72	33.22	37.14	21.67	13.48	36.45
C81	George Wimpey	253.00	2.13	58.51	30.84	29.75	18.65	14.77	33.42
C82	Taylor Woodrow	174.25	8.66	44.84	27.2	32.02	17.31	14.61	36.73
C83	Travis Perkins	1030.00	0.05	58.33	43.6	14.38	20.05	14.16	29.43
C84	Wolseley	533.75	5.07	58.87	43.63	23.45	23.98	15.89	31.63
C85	Alvis	147.17	3.29	84.42	20.71	12.12	9.31	12.33	51.14
C86	B A A	640.17	6.12	43.73	32.92	32.53	30.35	14.44	24.59
C87	BBA Group	194.88	3.03	57.86	59.5	43.04	36.09	14.14	33.75
C88	British Airways	227.92	-1.33	85.25	68.25	83.71	54.99	15.94	41.05
C89	Cobham	1043.75	9.65	59.57	62.9	20.18	29.44	13.51	31.08
C90	Rolls Royce	118.50	3.76	71.74	37.5	43.17	18.25	15.57	34.33
C91	VT Group	293.33	8.74	68.67	94.21	20.03	19.36	12.93	25.62
C92	Arriva	279.25	11.64	64.62	50.79	39.70	28.67	14.55	31.76
C93	Exel	726.50	4.26	63.62	31.27	13.65	13.15	15.34	29.91
C94	Christian Salvesen	95.17	6.16	74.10	65.88	48.70	30.23	13.58	33.96
C95	TDG	150.50	4.55	54.82	29.58	37.21	17.82	13.24	28.11
C96	Tibbett & Britten	386.75	4.72	93.36	63.42	37.58	22.32	14.20	38.03
C97	Associated British Ports	399.75	2.76	39.82	29.42	25.78	27.02	12.97	24.75
C98	Peninsular & Oriental	173.75	0.35	63.61	55.82	56.92	41.40	14.80	33.55
C99	BOC Group	905.67	10.80	65.62	39.57	25.50	30.93	15.11	20.20
C100	Croda International	256.50	2.37	52.36	29.4	18.95	22.85	12.66	31.33
C101	Delta	89.50	2.69	63.54	35.35	41.53	24.26	13.12	35.13

	Name	Share Price	ROA	TQ	Book Gearing	Market Gearing	Book D/E	Ln(TS)	Volatility
C102	Elementis	28.61	1.46	48.16	31.22	40.47	15.66	12.81	41.67
C103	Imperial Chemical Inds.	240.13	0.66	90.98	65.03	43.32	38.06	15.63	34.13
C104	Johnson Matthey	1013.67	2.34	51.01	34.31	17.96	23.09	15.39	29.09
C105	Intercare Group	234.75	2.73	59.47	107.23	29.08	30.39	12.53	39.88
C106	British Vita	247.25	4.72	44.38	16.9	11.27	9.73	13.70	29.62
C107	PZ Cussons	926.25	6.76	41.64	6.34	9.82	4.93	13.00	22.53
C108	Spirent	16.20	5.23	73.86	79.47	60.56	46.17	13.23	48.53
C109	BT Group	264.58	2.47	101.35	91.17	52.17	66.64	16.73	31.19
C110	Alba	380.00	3.27	62.69	48.67	19.84	34.22	12.99	37.11
C111	Chloride Group	50.67	3.23	59.74	48.08	29.24	19.22	11.91	48.24
C112	Domino Printing Sciences	124.50	10.01	39.67	14.78	5.89	8.66	11.99	32.80
C113	Invensys	109.17	7.85	97.80	114.46	65.61	54.57	15.76	57.42
C114	Laird Group	151.00	10.31	53.68	74.85	39.11	31.37	13.11	41.78
C115	TT Electronics	115.75	4.18	47.63	23.87	27.19	15.54	13.16	32.05
C116	First Choice Holidays	101.33	8.44	64.29	100.63	40.40	22.24	14.60	49.00
C117	Rank Group	274.25	-7.28	56.25	59.8	31.66	42.92	14.20	30.83
C118	Wembley	718.00	6.59	11.84	1.03	0.78	0.95	11.65	44.65
C119	De Vere Group	298.50	6.09	38.51	28.56	42.72	25.54	12.59	30.41
C120	Hilton Group	175.63	9.70	51.36	60.28	37.28	30.86	15.52	32.09
C121	Whitbread	632.33	3.86	45.79	35.47	39.23	30.24	14.52	25.99
C122	Wolverhampton & Dudley	592.00	1.93	59.29	59.32	53.54	46.34	13.13	25.58
C123	Associated British Foods	582.33	-4.56	31.60	13.89	8.83	10.33	15.33	25.19
C124	Cranswick	409.33	2.02	50.20	36.48	6.43	14.39	12.33	28.83
C125	Geest	494.00	-1.04	59.14	29.8	19.14	18.32	13.54	33.33
C126	Northern Foods	174.83	8.04	73.17	57.7	32.64	41.62	14.19	25.94
C127	Unilever	581.75	3.15	86.51	186.03	45.39	50.69	17.28	23.84
C128	Uniq	155.83	0.74	71.55	77.75	53.38	31.82	14.13	30.20
C129	Glenmorangie	690.83	3.97	45.28	12.39	11.24	8.12	10.98	24.86

Appendix B: Summary Statistics (1980-1997)

Country Name	Short Term Debt to Equity	Long Term Debt to Equity	Market Cap to GDP	Shares Traded to GDP	Turnover Ratio	FDI (Mil $)	GDP (Mil $)	Growth Rate	Inv	Liability to GDP	Bank Dep'st to GDP
Argentina	0.79	0.83	0.05	0.02	0.31	$ 1,816	$ 160,111	1.99%	18.79	0.15	0.20
Brazil	0.49	0.52	0.14	0.08	0.52	$ 3,436	$ 404,192	2.44%	20.77	0.20	0.26
Chile	0.92	0.81	0.49	0.05	0.08	$ 1,057	$ 36,092	5.48%	22.62	0.36	0.48
Colombia	0.38	0.28	0.07	0.01	0.09	$ 1,135	$ 50,463	3.68%	19.05	0.27	0.16
Egypt	0.91	0.88	0.07	0.01	0.09	$ 773	$ 37,892	4.33%	22.55	0.80	0.57
Greece	0.92	0.92	0.09	0.03	0.19	$ 786	$ 61,720	1.46%	20.52	0.66	0.42
India	0.29	0.38	0.14	0.05	0.48	$ 639	$ 230,584	5.32%	23.10	0.42	0.33
Indonesia	0.59	0.82	0.08	0.03	0.27	$ 1,497	$ 123,756	6.91%	29.43	0.30	0.33
Korea, Rep.	0.52	0.41	0.25	0.28	1.00	$ 2,326	$ 216,017	7.64%	33.06	0.50	0.50
Malaysia	0.49	0.53	1.22	0.56	0.32	$ 2,583	$ 48,381	7.00%	33.79	0.95	0.71
Mexico	0.66	0.63	0.17	0.07	0.53	$ 4,134	$ 243,171	2.31%	22.28	0.24	0.19
Nigeria	0.79	0.83	0.05	0.00	0.01	$ 784	$ 49,774	2.22%	17.21	0.26	0.16
Pakistan	0.83	0.72	0.19	0.04	0.24	$ 264	$ 41,301	5.71%	18.93	0.40	0.34
Peru	0.58	0.73	0.08	0.02	0.21	$ 695	$ 32,858	1.99%	22.19	0.15	0.11
Philippines	0.39	0.58	0.27	0.08	0.25	$ 983	$ 46,935	2.51%	22.79	0.36	0.32
Portugal	0.38	0.42	0.08	0.02	0.20	$ 1,950	$ 58,372	2.60%	27.82	0.73	0.80
South Africa	0.71	0.83	1.38	0.10	0.07	$ 207	$ 88,691	1.74%	20.74	0.45	0.58
Thailand	0.39	0.48	0.29	0.20	0.59	$ 1,276	$ 84,161	7.25%	34.33	0.63	0.63
Turkey	0.58	0.49	0.08	0.09	0.67	$ 427	$ 114,622	4.62%	21.31	0.23	0.19
Venezuela	0.81	0.73	0.09	0.02	0.16	$ 367	$ 64,250	1.46%	19.30	0.42	0.22
Zimbabwe	0.89	0.71	0.15	0.01	0.05	$ 11	$ 6,154	3.94%	20.46	0.39	0.22

Appendix C: SPSS output for the Regression Analysis

A C.1: Regression Analysis between Tobin's Q and Book Gearing

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Book_Gearing, Ln (TS), Volatility[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Tobin'sQ

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.631[a]	.398	.384	11.8757	.398	27.600	3	125	.000

a. Predictors: (Constant), Book_Gearing, Ln (TS), Volatility

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-39.231	12.198		-3.216	.002	-63.371	-15.090
	Ln (TS)	5.010	.753	.471	6.652	.000	3.520	6.501
	Volatility	.744	.138	.390	5.383	.000	.470	1.017
	Book_Gearing	6.805E-02	.020	.245	3.446	.001	.029	.107

a. Dependent Variable: Tobin'sQ

Coefficient Correlations[a]

Model			Book_Gearing	Ln (TS)	Volatility
1	Correlations	Book_Gearing	1.000	-.029	-.212
		Ln (TS)	-.029	1.000	.198
		Volatility	-.212	.198	1.000
	Covariances	Book_Gearing	3.900E-04	-4.33E-04	-5.79E-04
		Ln (TS)	-4.33E-04	.567	2.058E-02
		Volatility	-5.79E-04	2.058E-02	1.909E-02

a. Dependent Variable: Tobin'sQ

A C.2: Regression Analysis between Tobin's Q and Market Gearing

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Market_Gearing, Ln (TS), Volatility[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Tobin'sQ

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.693[a]	.480	.467	11.0432	.480	38.436	3	125	.000

a. Predictors: (Constant), Market_Gearing, Ln (TS), Volatility

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-19.807	11.869		-1.669	.098	-43.297	3.683
	Ln (TS)	3.625	.744	.341	4.869	.000	2.151	5.098
	Volatility	.564	.135	.295	4.187	.000	.297	.830
	Market_Gearing	.331	.057	.414	5.770	.000	.217	.445

a. Dependent Variable: Tobin'sQ

Coefficient Correlations[a]

Model			Market_Gearing	Ln (TS)	Volatility
1	Correlations	Market_Gearing	1.000	-.340	-.362
		Ln (TS)	-.340	1.000	.295
		Volatility	-.362	.295	1.000
	Covariances	Market_Gearing	3.292E-03	-1.45E-02	-2.79E-03
		Ln (TS)	-1.45E-02	.554	2.957E-02
		Volatility	-2.79E-03	2.957E-02	1.814E-02

a. Dependent Variable: Tobin'sQ

A C.3: Regression Analysis between Tobin's Q and Book D/E

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Book_D-to-E, Ln (TS), Volatility[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Tobin'sQ

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.708[a]	.501	.489	10.8120	.501	41.898	3	125	.000

a. Predictors: (Constant), Book_D-to-E, Ln (TS), Volatility

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-30.459	11.205		-2.718	.007	-52.635	-8.282
	Ln (TS)	4.140	.702	.389	5.901	.000	2.752	5.528
	Volatility	.673	.126	.353	5.349	.000	.424	.922
	Book_D-to-E	.371	.059	.416	6.335	.000	.255	.486

a. Dependent Variable: Tobin'sQ

Coefficient Correlations[a]

Model			Book_D-to-E	Ln (TS)	Volatility
1	Correlations	Book_D-to-E	1.000	-.213	-.215
		Ln (TS)	-.213	1.000	.233
		Volatility	-.215	.233	1.000
	Covariances	Book_D-to-E	3.423E-03	-8.74E-03	-1.58E-03
		Ln (TS)	-8.74E-03	.492	2.057E-02
		Volatility	-1.58E-03	2.057E-02	1.585E-02

a. Dependent Variable: Tobin'sQ

A C.4: Regression Analysis between Share Price and Book Gearing

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Book_Gearing, Ln (TS), Volatility[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Share Price

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.344[a]	.118	.097	346.3103	.118	5.583	3	125	.001

a. Predictors: (Constant), Book_Gearing, Ln (TS), Volatility

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	894.644	355.701		2.515	.013	190.669	1598.620
	Ln (TS)	-9.74E-02	21.964	.000	-.004	.996	-43.567	43.372
	Volatility	-15.579	4.029	-.339	-3.866	.000	-23.554	-7.604
	Book_Gearing	-.138	.576	-.021	-.240	.811	-1.278	1.002

a. Dependent Variable: Share Price

Coefficient Correlations[a]

Model			Book_Gearing	Ln (TS)	Volatility
1	Correlations	Book_Gearing	1.000	-.029	-.212
		Ln (TS)	-.029	1.000	.198
		Volatility	-.212	.198	1.000
	Covariances	Book_Gearing	.332	-.368	-.493
		Ln (TS)	-.368	482.419	17.505
		Volatility	-.493	17.505	16.237

a. Dependent Variable: Share Price

A C.5: Regression Analysis between Share Price and Market Gearing

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Market_Gearing, Ln (TS), Volatility[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Share Price

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.449[a]	.201	.182	329.6095	.201	10.493	3	125	.000

a. Predictors: (Constant), Market_Gearing, Ln (TS), Volatility

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	518.664	354.256		1.464	.146	-182.452	1219.780
	Ln (TS)	27.054	22.221	.106	1.218	.226	-16.924	71.032
	Volatility	-10.534	4.020	-.229	-2.621	.010	-18.489	-2.578
	Market_Gearing	-6.186	1.712	-.321	-3.613	.000	-9.575	-2.797

a. Dependent Variable: Share Price

Coefficient Correlations[a]

Model			Market_Gearing	Ln (TS)	Volatility
1	Correlations	Market_Gearing	1.000	-.340	-.362
		Ln (TS)	-.340	1.000	.295
		Volatility	-.362	.295	1.000
	Covariances	Market_Gearing	2.932	-12.943	-2.489
		Ln (TS)	-12.943	493.766	26.346
		Volatility	-2.489	26.346	16.158

a. Dependent Variable: Share Price

A C.6: Regression Analysis between Share Price and Book D/E

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Book_D-to-E, Ln (TS), Volatility[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Share Price

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.371[a]	.137	.117	342.5294	.137	6.632	3	125	.000

a. Predictors: (Constant), Book_D-to-E, Ln (TS), Volatility

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	815.828	354.985		2.298	.023	113.269	1518.387
	Ln (TS)	7.712	22.224	.030	.347	.729	-36.273	51.696
	Volatility	-14.340	3.988	-.312	-3.596	.000	-22.233	-6.447
	Book_D-to-E	-3.120	1.854	-.145	-1.683	.095	-6.789	.548

a. Dependent Variable: Share Price

Coefficient Correlations[a]

Model			Book_D-to-E	Ln (TS)	Volatility
1	Correlations	Book_D-to-E	1.000	-.213	-.215
		Ln (TS)	-.213	1.000	.233
		Volatility	-.215	.233	1.000
	Covariances	Book_D-to-E	3.436	-8.768	-1.590
		Ln (TS)	-8.768	493.918	20.648
		Volatility	-1.590	20.648	15.904

a. Dependent Variable: Share Price

A C.7: Regression Analysis between ROA and Book Gearing

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Book_Gearing, Ln (TS), Volatility[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: ROA

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.213[a]	.045	.022	7.0823	.045	1.976	3	125	.121

a. Predictors: (Constant), Book_Gearing, Ln (TS), Volatility

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-7.820	7.274		-1.075	.284	-22.217	6.576
	Ln (TS)	.663	.449	.132	1.477	.142	-.226	1.552
	Volatility	2.142E-02	.082	.024	.260	.795	-.142	.185
	Book_Gearing	2.184E-02	.012	.166	1.855	.066	-.001	.045

a. Dependent Variable: ROA

Coefficient Correlations[a]

Model			Book_Gearing	Ln (TS)	Volatility
1	Correlations	Book_Gearing	1.000	-.029	-.212
		Ln (TS)	-.029	1.000	.198
		Volatility	-.212	.198	1.000
	Covariances	Book_Gearing	1.387E-04	-1.54E-04	-2.06E-04
		Ln (TS)	-1.54E-04	.202	7.321E-03
		Volatility	-2.06E-04	7.321E-03	6.791E-03

a. Dependent Variable: ROA

A C.8: Regression Analysis between ROA and Market Gearing

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Market_Gearing, Ln (TS), Volatility[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: ROA

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.168[a]	.028	.005	7.1457	.028	1.205	3	125	.311

a. Predictors: (Constant), Market_Gearing, Ln (TS), Volatility

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-5.618	7.680		-.732	.466	-20.818	9.582
	Ln (TS)	.510	.482	.101	1.059	.292	-.443	1.464
	Volatility	1.977E-02	.087	.022	.227	.821	-.153	.192
	Market_Gearing	4.018E-02	.037	.106	1.082	.281	-.033	.114

a. Dependent Variable: ROA

Coefficient Correlations[a]

Model			Market_Gearing	Ln (TS)	Volatility
1	Correlations	Market_Gearing	1.000	-.340	-.362
		Ln (TS)	-.340	1.000	.295
		Volatility	-.362	.295	1.000
	Covariances	Market_Gearing	1.378E-03	-6.08E-03	-1.17E-03
		Ln (TS)	-6.08E-03	.232	1.238E-02
		Volatility	-1.17E-03	1.238E-02	7.594E-03

a. Dependent Variable: ROA

A C.9: Regression Analysis between ROA and Book D/E

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Book_D-to-E, Ln (TS), Volatility[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: ROA

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.151[a]	.023	-.001	7.1647	.023	.977	3	125	.406

a. Predictors: (Constant), Book_D-to-E, Ln (TS), Volatility

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-7.362	7.425		-.992	.323	-22.058	7.333
	Ln (TS)	.618	.465	.123	1.328	.186	-.303	1.538
	Volatility	4.115E-02	.083	.046	.493	.623	-.124	.206
	Book_D-to-E	2.747E-02	.039	.065	.709	.480	-.049	.104

a. Dependent Variable: ROA

Coefficient Correlations[a]

Model			Book_D-to-E	Ln (TS)	Volatility
1	Correlations	Book_D-to-E	1.000	-.213	-.215
		Ln (TS)	-.213	1.000	.233
		Volatility	-.215	.233	1.000
	Covariances	Book_D-to-E	1.503E-03	-3.84E-03	-6.96E-04
		Ln (TS)	-3.84E-03	.216	9.034E-03
		Volatility	-6.96E-04	9.034E-03	6.959E-03

a. Dependent Variable: ROA