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Chapter Five

Dedication

To my dear wife, evlyn, I dedicate this project paper.

Tatia, my sweet daughter, you are the fountain of my inspiration.

Acknowledgement

he success of this study is indebted to many people who took their treasured time to ive ideas, suggestions, and support.

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ABSTRACT

This paper presents an empirical examination of firm characteristic determinants of the capital structure of 31 companies listed on the Nairobi Stock Exchange for a period of 6 years from 2000 to 2007. The capital structure of a company consists of a particular combination of debt and equity issues to relieve potential pressures on its long-term financing. To examine such issues, many theories have been developed in the literature and they generally focus upon what determinants are likely to influence the *so-called* leverage decisions of the firms. Among these, the MM theory, trade-off theory and agency theory have been said to mainly play a crucial role in identifying and testing the various properties of the leverage decisions. This paper briefly tries to define the fundamentals underlying these theories and evaluates whether some *a priori* assumed macroeconomic determinants can be related to the leverage parameters of interest examined in the paper. The paper then zeroes in on size a determinant of capital structure. Studies that have been done so far relate to big firms in developed markets developed markets, Rajan and Zingales (1995).However, similar studies can now be done in small and medium sized firms in developing markets, Booth et al. (2001),like the NSE in Kenya. Following the developments in the contemporaneous estimation techniques that allow us to use time series and cross section data concurrently, the panel data methodology has been applied to the actual data to compute the leverage ratios for each firm within the time period 2000-2007.Our main result reveals that firm size has a positive and statistically significant impact on the firm's leverage ratio as evidenced in the empirical works of Huang and Song (2002), Rajan and Zingales (1995) and Friend and Lang (1988).

CHAPTER ONE

1.0 Introduction

1.1 Background of the Study.

How businesses are financed is one of the most fundamental questions of finance research. Financial capital is one of the necessary resources required for firms to form and subsequently operate. The importance of the financing decision of businesses consequentially has important implications for the economy, given the role firms play in employment growth, competition, innovation and export potential. Additionally, capital decisions and the use of debt and equity have been shown to have important implications for the operations of the business, risk of failure, firm performance and the potential of the business to expand in the future. A firm can combine different proportions of debt and equity in an attempt to increase its market value and this is recognized as capital structure of the firm. Firms differ with respect to capital structure which has given birth to different capital structure theories in an attempt by researchers to explain variation in capital structure over time or across regions.

Modigliani and Miller (1958) demonstrated that the market value of a firm is determined by its earning power and the risk of its underlying assets, and is independent of the way it chooses to finance its investments or distributes dividends. Moreover, a firm can choose between three methods of financing: issuing shares, borrowing or spending profits (as opposed to disbursing them to shareholders as dividends). The theorem gets much more complicated, but the basic idea is that under certain assumptions, it makes no difference whether a firm finances itself with debt or equity.

Although this theory is based on many unrealistic assumptions, it provides the basic theoretical background for further research. These assumptions include no agency costs, Information Symmetry, all cashflow streams are perpetual, no corporation and personal taxes, all firms are in the same risk class, firms issue only riskfree debt and equity, no bankruptcy costs, individuals can borrow and lend at the risk free rate,

and capital markets are frictionless (Kretlow W.J.,McGuigan J.R. and Moyer R.C.,1999).

After Modigliani and Miller (1958), a lot of research was done on optimal capital structure and the determinants of capital structure. During this period, among others, three main theories emerged to explain the behaviour of the firm in choosing its capital structure. These are Static Trade-off Theory, Pecking Order Theory and the Signalling Theory.

The main ground upon which capital structure theory was initially developed concerned the large listed firms. However, several authors have pointed out that the theoretical implications of capital structure can also be applied in the small firm context. Kinyua (2005) concludes that most small and medium size firms prefer the use of short term credit followed by retained earnings then long term loans. Issuing of new ordinary share capital was not common. Small and medium sized firms seek to raise capital to finance its long term operations just like the big firms. However, research tends to concentrate on the big firms especially in the developed economies like the USA as suggested by Regan and zingales (1995) and the results of such research are replicated on the small and medium firms of the developing economies. This, in most cases, fails because the kind of management fears, availability of information, and exposure to the market risks of big and small firms in the developed and developing economies is different.

The public has a great fascination with lists - the biggest, the fastest, the richest or the best. But with any such compilation there is plenty of disagreement about the best way to measure. This is particularly true when measuring corporate size i.e. whether small, medium or large. Forbes 500s, a magazine in the USA, identifies the largest U.S. corporations by four separate metrics: sales, profits, assets and market value and concludes that size matters but measuring it is tricky.

Larger firms have easier access to capital markets and borrow at more favourable interest rates perhaps because they are more diversified in their investments and therefore have a lower risk of default. Larger firms, by virtue of being more diversified, fail less often, so size (computed as the logarithm of turnover) may be an inverse proxy for the probability of bankruptcy.

An alternative argument is that firm size can be viewed as a proxy for information asymmetry between the firm and market. It's thought that the larger the firm the more the information that is available for it and the lower the cost caused by information asymmetries, ceteris paribus.

The cost of issuing debt and equity securities is also related to firm size. In particular, small firms pay much more than large firms to issue new equity and also somewhat more to issue long-term debt.

But just how is the size of a firm determined? How are firms in different industries to be compared with each other? For example, in the Nairobi Stock exchange (NSE), how do you compare the size of firms listed under the Agricultural, Commercial and Services, Finance and Investment, Industrial and Allied sectors? Does sales turnover provide a useful yardstick? How about the number of employees? How many branches it has? The size of the branches? The balance sheet? In this day of increasing mergers and acquisitions among firms in different industries, such questions seem to be gaining significance.

There are only a limited number of studies on factors influencing capital structure among Kenyan firms. The studies that have been conducted include Matibe (2005), Onsomu Z.N.(2003); Kamere I.N. (1987); Chonde (2002);Kinyua J.M. (2005); Kiogora M. (2000). As for similar studies in other countries, especially in the developed countries like the studies done in the USA by Rajan and Zangales (1995), most empirical evidence on capital structure tends to focus on large firms. Only in recent years have a few studies examined these issues either in developing countries or among small firms. Carrying out similar studies in different environments would assist in testing the robustness of the conclusions arrived at in the USA. Hence studies are now being carried out on the relationship between capital structure and factors like value of a firm, size of a firm, industry risk etc for small and medium size firms.

In Kenya, such studies are minimal and have concentrated on the relationship between capital structure and value of firms listed at the NSE; relationship between debt ratio and factors such as asset value, firm size, profitability, growth of firm,

liquidity ,non-debt tax shield, stability of future sales, level of interest rate in the country, asset structure ,lending attitude towards the firm (Kamere,1987;chonde,2002,Kinyua ,2005).

Based on the limited number of studies with respect to factors influencing capital structure among Kenyan firms, this paper attempts to study the relationship of capital structure and size of Kenyan firms listed in the NSE over the period 2002-2007 during which the markets had not been affected by the post election violence. The study will combine data from financial statements and other relevant information from the NSE, focusing on the relationship between capital structure and size of the firms listed on the NSE.

1.2 Statement of the Problem

There are several theoretical reasons why firm size would be related to the capital structure of the firm. Firstly, smaller firms may find it relatively more costly to resolve informational asymmetries with lenders and financiers (Myers and Majluf, 1984). Consequently, smaller firms are offered less capital or are offered capital at higher costs relative to larger firms, which discourages the use of outside financing. Such effects should be more prevalent around start-up as new firms are more informationally opaque than existing firms.

Small firms are often managed by very few managers whose main objective is to minimize the intrusion in their business and avoid the discipline inherent in other financing options than internal funds (Jensen and Meckling, 1986). That is why internal funds will lie in the first place of their preference of financing. In case internal funds are not enough, small firms will prefer debt to new equity mainly because debt means lower level of intrusion and, most importantly, lower risk of losing control and decision-making power than new equity.

Boateng A. (2004) undertook a study on the relationship between capital structure and various other factors for 41 joint venture firms in Ghana in the years between 1965 and 1995.He concluded that size of a joint venture, industry of joint venture and ownership level of foreign ownership were positively related to debt level.

Kiamere (1987) carried out a study on the relationship between debt ratio and some factors i.e. stability of future sales, level of interest rates in the economy, asset structure, lending attitude towards the firm, tax advantage of debt, size of the business that influence the capital structure for all the public firms in Kenya during the period 1981 and 1985.He concluded that future cashflows, level of interest rates in the economy, asset structure were positively related to debt ratio. No significant relationship between debt ratio and the other factors was found.

Chonde (2002) studied the relationship between debt ratio and some other factors i.e. asset value, firm size, profitability, growth of the firm, liquidity, non-debt tax shield that influence capital structure for a number of state controlled enterprises in Kenya during the years between 1994-1998.He concluded that profitability and growth showed positive relationship to leverage while the other factors showed negative correlation.

Onsomu (2003) undertook a regression of debt/equity ratio against value of firms quoted on the NSE with an exception of firms listed under the finance and investment sector. The study did not find any significant relationship between debt level and value of the firm as evidenced by MM,1958.

The studies that have been done in Kenya on capital structure have focussed on testing separately the main theories of capital structure and also the relationship between capital structure and other determinants. It appears that a lot of empirical work needs to be done in the area of capital structure in Kenya according to Mirie, M (2007).

These studies that have been done shed light on the specific characteristics of firms and industries that determine leverage ratios. These studies generally agree that leverage increases with fixed assets, profitability, non-debt tax shields, growth opportunities, and decreases with volatility, advertising expenditures, research and development expenditures, bankruptcy probability, and uniqueness of the product.

However, the results of both theoretical and empirical studies on the relationship between size and leverage are not always unambiguous. Some authors find a positive relation between size and leverage, for example, Huang and Song (2002), Rajan and Zingales (1995) and Friend and Lang (1988). On the other hand, some studies report a negative relation, for example, Kester (1986), Kim and Sorensen (1986) and Titman and Wessels (1988), Chonde (2002).

As a result of the variances in findings of the above studies done, this study tries to answer the question - Does the size factor have any relationship with capital structure of firms listed at the NSE?

1.3 Objective of the Study

To determine the relationship between the capital structure and the size of the firm for companies listed on the NSE.

1.4 Hypotheses of the Study

H_0: There is no significant relationship between capital structure and size of a firm

H_A: There is a significant relationship between capital structure and size of a firm.

1.5 Importance of the Study

The research findings shall be used by various stakeholders in diverse ways that include the following:-

Researchers and Academicians

The study will add more knowledge in the area of capital structure and offer a foundation for further research on capital structure especially in developing economies.

Investors

The results of this study will give a clear guidance to both current and future investors in making informed decisions whether or not to invest in highly levered firm as it will have a bearing on value optimization of the firm.

Investment Managers

As the people charged with the responsibility of making capital decisions, they will benefit from knowing if size matters in deciding which funding source to access.

Financial Consultants

The study will enable them to offer enhanced advice to clients with regard to the optimal capital structure for a given firm size.

Suppliers of non-equity finances to firm

These are faced with various risks especially default risk. In attempting to optimize risk and return, they will benefit by knowing if size if a major determinant of the level of indebtness of a firm so that they can accept any funding request by a firm or take suitable action if they have already provided the funds.

1.6 Assumptions of the Study

The study takes sales revenue as a proxy of the size of a firm and that trading at the NSE was revamped after the change of political regime in the year 2002 but was subdued after the presidential elections in the month of December 2007.

1.7 Scope of the Study

The study covers all firms listed at the NSE subject to the researcher's bias and spreads over the calendar years 2002 to 2007.

Chapter Two

2.0 LITERATURE REVIEW

2.1 Introduction

Firm size has become such a routine to use as a control variable in empirical corporate finance studies that it receives little to no discussion in most research papers even though not uncommonly it is among the most significant variables. This paper's goal is to provide rationale for one of the size relationships, that is, between firm size and capital structure. Cross-sectionally, it has been consistently found that large firms in the developed economies tend to have higher leverage ratios than small firms. According to Kurshev (2005), International evidence suggests that in most, though not all, countries leverage is also cross- sectionally positively related to size

Intuitively, firm size matters for a number of reasons. In the presence of non-trivial fixed costs of raising external funds large firms have cheaper access to outside financing per each shilling borrowed (Ferri and Jonnes,1979). Related, larger firms are more likely to diversify their financing sources. Alternatively, size may be a proxy for the probability of default for it is sometimes contended that larger firms are more difficult to fail and liquidate, or, once the firm finds itself in distress, for recovery rate. Size may also proxy for the volatility of firm assets, for small firms are more likely to be growing firms in rapidly developing and thus intrinsically volatile industries. Yet, according to Myers (1984),another explanation is the extent of the wedge in the degree of information asymmetry between insiders and the capital markets which may be lower for larger firms, for example because they face more scrutiny by ever-suspicious investors.

Capital structure is defined as the relative amount of debt and equity used to finance a firm. It's the relative amount of permanent short term debt, long term debt, preferred stock and common equity used to finance a firm. In contrast, financial structure refers to the amount of total current liabilities, long term debt, preferred stock and common equity used to finance the firm. Thus, capital structure is part of

financial structure, representing the permanent sources of a firm's financing. The optimal capital structure is the mix of debt, preferred stock and common stock that minimizes the weighted cost to the firm of its employed capital. At the capital structure where the weighted cost of capital is minimized, the total value of the firm's securities (and, hence, the value of the firm) is maximized. As a result, the minimum-cost capital structure is called the optimal capital structure (Kretlow W. J. 1990).

According to Schwartz (1959), there exists a single optimum capital structure for any given firm that maximizes its value. Firms usually face two types of risks i.e. the industry related risk (external risk) and firm related risk captured by debt/equity ratio (Internal risk).If equity is held constant, a firm would continue to borrow until the marginal return of earnings from the additional assets financed by the debt equals the marginal cost of the funds. This means that beyond the equality of marginal earnings and marginal costs of funds, any additional borrowing would lead to reduction of value hence the existence of optimal capital structure which is firm specific and varies across different industries. This resonates the static trade-off theory. The conclusion of Schwartz were echoed by Kiogora (2000) who tested variations based on sectors in capital structure of firms listed on the NSE between 1991-1998.The results of his study were that there are differences in the capital structure among industry groupings and those firms within a given sector tend to cluster towards some target capital structure.

The amount of debt contained in a firm's optimal capital structure is referred as a firm's debt capacity. The optimal capital structure and accordingly the debt capacity of the firm are determined by factors such as business risk of the firm, the tax structure, the extent of potential bankruptcy and agency costs and the role played by capital structure policy in providing signals to the capital markets regarding the firm's performance. (Moyer C. R 1990) .

2.2 Theoretical Framework

Theories explaining capital structure and the variation of debt ratios across firms range from the irrelevance of capital structure, proposed by Modigliani and Miller (1958), to a host of relevance theories. If leverage can increase a firm's value in the MM tax model (Modigliani and Miller 1963; Miller 1977), firms have to trade off between the costs of financial distress, agency costs (Jensen and Meckling 1976) and tax benefits, so as to have an optimal capital structure. However, asymmetric information and the pecking order theory (Myers and Majluf 1984; Myers 1984) state that there is no well defined target debt ratio. The latter model suggests that there tends to be a hierarchy in firms' preferences for financing: first using internally available funds, followed by debt, and finally external equity.

In the no tax MM case, the cost of debt and the overall cost of capital are constant regardless of a firm's financial leverage position, measured as the firm's debt-equity ratio, B/E. As a firm increases its relative debt level, the cost of equity capital, K_e increases, reflecting the return requirement of stock holders due to the increased risk imposed by the additional debt. The increased cost of equity capital exactly offsets the benefits of the lower cost of debt, K_d , so that the overall cost of capital does not change with change in capital structure.

Optimal capital structure consists entirely of debt if a corporate income tax exists and there are no bankruptcy or agency costs. Weston (1954) states that a firm may borrow so long as the incremental returns from borrowing exceed incremental costs of borrowing, taking into account the additional risks that may be involved by incurring more debt. A firm would thus continue to borrow until its value is maximized. Any more borrowing would result in a reduction of shareholders' value.

Given corporate income tax, bankruptcy costs, and agency costs, an optimal capital structure consisting of both debt and equity is shown to exist. However, according to Miller (1977), bankruptcy costs should be insignificant as it is in the best interest of all the stakeholders to control them.

The emphasis of capital structure analysis is of the firm's long range target capital structure i.e. the capital structure at which the firm ultimately plans to operate. In his study on the existence of capital structure and if firms tend to make adjustments to it, Marsh (1982) discovered that firms tend to make choices of financing instruments as if they had target debt ratios in mind. For most firms, the current and target capital structure are virtually identical. Occasionally, however, firms find it necessary to change from their current capital structure to a different target .The reasons for such change may involve a change in a firm's asset mix (and a resulting change in its risk) or an increase in competition that may imply more risk.

The corporate finance literature offers two competing bodies of theory explaining firms' capital structure choice. The first, trade-off theory, is a school of thought consisting of several theorems that describe the forces underlying the trade-off between the advantageous and disadvantageous effects of debt financing on firm value. On the one hand, increasing leverage by taking on more debt means that the firm can profit more from debt tax shields, which will increase its value (Modigliani and Miller's (1963) Proposition I under corporate taxes). On the other hand, higher leverage leads to higher (expected) direct and indirect costs of financial distress, decreasing the firm's value. Direct costs include the legal and administrative costs of liquidation or reorganization. Indirect costs refer to the impaired ability to conduct business and to agency costs of debt that are specifically related to periods of high bankruptcy risk (such as the incentive for stockholders to select risky projects) (Rosset al., 2002). The second line of reasoning as regards firms' capital structure choice is the pecking order hypothesis.

Fama and French (2002) noted that on many issues there is no conflict between Trade-Off theory and Pecking Order theory. The two theories share many predictions about capital structure such that controlling for other effects, more profitable firms have a higher dividend payout and those firms with more investments have lower payouts.

2.2.1 Original M&M Theory

Capital structure irrelevant theory is under 'without taxes' environment; the value of a geared and an ungeared firm is equal. Capital structure has no effect on a firm's WACC, so capital structure is irrelevant. Cost of equity will increase as the debt-equity ratio increases. And equity risk can be split into business risk and financial risk (McGuigan, 1999). This theory is the basic research of capital structure in economic sphere, which has been regarded as a statement in a prefect market. Economists including M&M themselves were all interested in research about capital structure. This theory has been accepted widely and used in area outside financial firms, for example currency bank, financial policy and international finance. However, it could be understood that people suspect it in practice. Because whenever we pick up any financial newspaper or magazine, we can see that such contents, that is, when a firm after a capital restructuring, the market value will be increased substantially.

2.2.2 Modified M&M Theory

So, in 1963 M&M modified their original theory. Capital structure relevant theory was published, it is under taxes environment; the value of a geared firm is equal to the value of an ungeared firm plus the present value of the interest tax shield. There are significant advantages to a firm in using debt in its capital structure. A firm's cost of equity will increase and the WACC will decline as the debt-equity ratio increases. (McGuigan, 1999) These two theories are capital structure theory in the two extreme views of debt configuration.

However, the assumptions of M&M (1958) theory do not exist in real life obviously. Firms should trade-off between using debt and using equity to finance. So, modern trade-off theory of capital structure came out. Trade-off theory can be expressed by Vg=Vu + Value of the tax shield - Present Value of the expected cost of bankruptcy (McLaney, 1986).

Where:-

V_g - is value of geared firm;

V_u – is the value of ungeared firm.

This theory or mainstream view prefers to explain capital structure in terms of a trade-off between agency/bankruptcy costs and the tax shield on debt interest. This theory has more meaning in practice. Myers (1984) argued that the theory performs at least as well as the static trade-off theory, which has breathed new life into the pecking order framework. From his research, we can get the static trade-off works to some extent; it sounds plausible and yields an interior optimum of debt ratio, but the moderate and plausible does not make it right.

Static Trade-Off Theory (STT) explains that a firm follows a target debt-equity ratio and then behaves accordingly. The benefits and costs linked with the debt option sets this target ratio. There are significant advantages of debt including tax advantage, management disciplining effect of debt .The costs include bankruptcy costs-both direct and indirect, agency costs, decision inflexibility.

The bankruptcy cost explains the positive relation between the capital structure and size of a firm. The large firms are more diversified (Remmers and others 1974), have easy access to the capital market, receive higher credit ratings for debt issues, and pay lower interest rate on debt capital (Pinches and Mingo 1973). Further, larger firms are less prone to bankruptcy (Titman and Wessels 1988) and this implies the less probability of bankruptcy and lower bankruptcy costs. The bankruptcy cost theory suggests the lower bankruptcy costs, the higher debt level. The empirical studies carried out during the 1970s, as suggested by this theory, also show the positive relation between the size of firms and capital structure (Martin and others 1988).

2.3 Agency costs

Agency costs are costs incurred by the owners of a firm when the firm is managed by others. It includes monitoring costs, bonding costs and any other losses that cannot be eliminated economically by monitoring and bonding. (Jensen and Meckling ,1976).

Agency theory suggests that there exists an optimal debt level in capital structure that can minimize the above agency costs. To mitigate the agency problems, various methods have been suggested. Jensen and Meckling (1976) suggest either to increase the ownership of the managers in the firm in order to align the interest of managers with that of the owners or increase the use of debt which will reduce the equity base and thus increase the percentage of equity owned by managers. Grossman and Hart (1982) suggest that the use of debt increases the chances of bankruptcy and job loss that further motivate managers to use the organizational resources efficiently and reduce their consumption on perks. Jensen (1986) present free-cash flow hypothesis. Free cash flow refers to cash flow available after funding all projects with positive cash flows. Managers having less than 100% stake in business and their compensation tied to firm's expansion may try to use the free cash flows sub-optimally and increase firm size resulting in greater compensation (Baker, Jensen, and Murphy, (1988); Donaldson, (1984)). Jensen (1986) suggests that this problem can be somehow controlled by increasing the stake of managers in the business or by increasing debt in the capital structure, thereby reducing the amount of "free" cash available to managers.

Once a debt is outstanding, shareholders have the incentive to take actions that benefit themselves at the expense of the bondholders. So if there is debt outstanding, the objectives of maximizing the value of the firm and the value of the equity are not identical. Some examples of bondholder-shareholder conflicts are: claim dilution, dividend payout and asset substitution.

Since the conflicts of interest between stockholders and bondholders reduce the price of the debt, the stockholders bear all of the costs of the conflict. Even though

the shareholders bear the costs of the conflict, there is still an incentive to extract value or expropriate from the bondholders - after the debt is outstanding.

Since the stockholders bear the costs that arise from the conflicts of interest, they have an incentive to minimize the agency costs. Bond covenants are detailed enforceable contracts that reduce agency costs by restricting the stockholders' actions after the debt is issued. The covenants may restrict the production and investment policy (i.e. mergers, sale of certain assets and lines of business). The covenants may restrict the financial policy of the firm (i.e. dividend payouts, priority and total debt). Furthermore, there is usually a provision for auditing. The bond covenants will reduce but will not eliminate these agency costs. Note that there are also costs involved in monitoring the firm's actions (Kretlow W.J.,McGuigan J.R. and Moyer R.C.,1999).

2.4 Bankruptcy Costs

Miller (1977) noted that there are many costs involved in bankruptcy. The direct costs are legal fees and court costs. The indirect costs arise from discontinued operations, the hesitancy of customers to purchase the product and the unwillingness of suppliers to extend any credit. These costs make it unlikely that a firm will push its debt equity ratio very high. If we take the bankruptcy costs into account, then there may be an optimal capital structure where the marginal tax advantage equals the marginal bankruptcy costs. Note that the marginal bankruptcy costs may be different across firms. This may explain why all firms do not have the same level of debt-equity. Direct bankruptcy costs appear to constitute a larger proportion of a firm's value as that value decreases. It is also the case that relatively large firm tend to be more diversified and less prone to bankruptcy. These arguments suggest that large firms should be more highly leveraged.

Shapiro and Titman (1985) and Castanias (1983) discuss that because of bankruptcy risk, managers would not likely to use debt choice. However, since larger firms have a chance to be more diversified, they have relatively little bankruptcy risk. Titmand and Wessels (1988). Warner (1977) suggests that bankruptcy costs would be higher for smaller firms. In this sense, there exist several researches for the effect of size

on leverage decisions. Friend and Hasbrouck (1988) and Crutchley and Hansen (1989) report a positive correlation, whilst Feri and Jones (1979) suggest that firm's size has a significant impact on leverage even though the sectoral decisions have been observed to vary among industries. The measure of size used in this paper is the natural logarithm turnover similar to the approach followed by Drobetz and Fix (2003). They discuss the logarithm of total assets as an alternate, however, they accept the turnover as a better proxy for the measure of size

The cost of issuing debt and equity securities is also related to firm size. In particular, small firms pay much more than large firms to issue new equity and also somewhat more to issue long-term debt. This suggests that small firms may be more leveraged than large firms and may prefer to borrow short term (through bank loans) rather than issue long-term debt because of the lower fixed costs associated with this alternative.

Ferri and Jones (1979) argue that larger firms could have easier access to capital markets and borrow at more favourable interest rates perhaps because they are more diversified in their investments and therefore have a lower risk of default. However, as firms become highly leveraged, they might no longer be able to borrow at favourable terms regardless of their size. Thus, size may have a positive impact at low and moderate debt ratios but a negligible or zero impact on firms with high debt ratios

Harris and Raviv (1991) state that several studies have shed light on the specific characteristics of firms and industries that determine leverage ratios. These studies generally agree that leverage increases with fixed assets, non-debt tax shields, growth opportunities, and firm size and decreases with volatility, advertising expenditures, research and development expenditures, bankruptcy probability, profitability and uniqueness of the product. However, the results of both theoretical and empirical studies are not always unambiguous

From the theoretical point of view, the effect of size on leverage is ambiguous. As Rajan and Zingales (1995) claim: "Larger firms tend to be more diversified and fail less often, so size (computed as the logarithm of turnover) may be an inverse proxy

for the probability of bankruptcy. If so, size should have a positive impact on the supply debt. However, size may also be a proxy for the information outside investors have, which should increase their preference for equity relative to debt."

2.5 OTHER DETERMINANTS OF CAPITAL STRUCTURE

Uniqueness

Titman (1985) holds that firms in highly specialized market segments suffer greater losses in bankruptcy as compared to less unique firms. The workers in these industries are often specialists in their particular fields and are less employable in the event of retrenchment. In addition, their customers may find it difficult to obtain servicing for their specialized products. Suppliers of specialized firms also suffer financially since they handle very specific products for unique processes which are not employed by other industries in general. Because of the risks faced by these unique firms, they try to minimize the use of debt to maintain a low risk profile hence a negative relation with debt.

Cash Holdings

The level of cash holding in a firm is a measure of internal funds available for financing investments and is hypothesized to be a determinant of capital structure. Jensen (1986), arguing within the context of takeovers suggested that cash rich firms are attractive take over targets. He argued that managers are motivated to increase the firm size as this is related to their prestige and compensation. In achieving their aim, managers may undertake negative NPV projects. Financing these projects with external funds imposes scrutiny by capital markets agents and may attract negative publicity. He suggested that firms with high level of free cash flow should use debt to prevent managers from wasting it. The introduction of debt increases external repayment and thus reduces the firm's free cash flow hence a positive relation with debt.

Growth Opportunities

Myers (1977) identified two types of assets of a firm i.e. tangible assets and growth opportunities. Growth opportunities give managers greater discretion in their choice

of future investments. This increases the difficulty of monitoring managerial activities and raises agency costs of equity, such as those associated with curbing the tendency for equity controlled firms to effect wealth transfers from debt holders to share holders by investing sub-optimally. Expected future growth is thus hypothesized to be negatively related to long term debt holding. Myers (1977) suggested the use of short term debt to reduce the cost associate with contractually bonding management. If an investment opportunity arises before debt matures then firms never get the chance to invest sub -optimally. Long term debt can be replicated by rolling over short term debt and sub -optimal investments will always be avoided.

Further, a negative relation between debt and growth opportunities is also possible if growth opportunities are viewed as intangible assets which are not collateralizable for the purpose of borrowing funds. Hence a firm's borrowing capacity is limited to the extent that their assets are in the form of intangible or unreleased growth opportunities. Titman and Wessels (1987).

Non Debt Tax Shields

Arguments put forward by Modigliani and Miller (1966) suggest that firms gain an advantage in the form of tax deductions associated with interest payments on debt. Subsequently, DeAngelo and Masulis (1980) formalized a framework whereby tax deductions (tax shield) which are not associated with debt act as substitutes for interest deductions. These non-debt tax shields minimize the use of debt by providing tax advantage similar to debt. Therefore it is hypothesized to be a factor which determines the level of debt held in a firm and is negatively related to debt level.

Profitability

Following Ross'(1977) signaling theory, and in the presence of asymmetric information, managers are supposed to effect capital structure changes to indicate future profitability of the firm. Alternatively, if managers share in a firm's profitability via compensation plan, and are primarily responsible for a firm's financing decisions, a nexus is forged between firm's profitability and managerial wealth. The desire to

signal future profitability, therefore, stems from managerial preferences (Blazenko,(1987)).Future profitability is viewed as an attribute which determines a firm's capital structure and is expected to be positively related to leverage since managers utilize debt to signal investments which yield high profits in the future.

Collateralizable Value of Assets

These are those assets which creditors require as security for a loan. Arguments put forward by Jensen and Meckling (1976) and Myers and Majluf (1984) suggest the use of debt financing to contractually bond and align managers interests with those of shareholders. Debt financing introduces the interplay of debt covenants and financial reporting requirements of regulatory authorities which restrict manager's ability to consume excessive perquisites and subject their actions to public scrutiny. Thus the cost associated with agency problems may be reduced. High levels of debt finance, however, are only feasible if firms can offer tangible collateral as security.

In addition, creditors that are wary of transfer of wealth away from them to shareholders would require their loan advances to be secured or collateralized against tangible assets since this restricts the use of funds to a specific project and gives creditors recourse to the value of the assets in case of default. Myers 91977).Without collateralizable assets the cost of borrowing may be prohibitively high. (Creditors may demand very generous discounts or high interest repayments as a prerequisite to making the loan).Hence their existence increases the firm's borrowing opportunities hence a positive relation with debt level.

Empirical studies do not provide us with clear information with regard to size. Some authors find a positive relation between size and leverage, for example Huang and Song (2002), Rajan and Zingales (1995) and Friend and Lang (1988). On the other hand, some studies report a negative relation, for example, Kester (1986), Kim and Sorensen (1986) and Titman and Wessels (1988),Chonde (2002). Moreover, the results are very often weak as far as the level of statistical significance is concerned.

Chonde (2002) carried out a study aimed at establishing what the capital structures of Kenyan public sector enterprises (Parastatals) are and the factors affecting their capital structure. According to him, the Kenyan public sector firms offer a unique

opportunity of testing capital structure because most firms are not traded on the capital market and do not issue shares to the public. Thus the choice of financing is basically between internal funds and private loans. The research done was on public companies with financial statements between 1994-1998.He concluded that in the public sector firms, qualitative factors do play a significant role in determining leverage ratios of public enterprises. These qualitative factors include parent ministry aspect, legality and strategic considerations by the government, composition of the board of directors.

Kamere (1987) sought to ascertain the important factors influencing leverage from correspondents. He found out the following factors to be important in Kenyan firms: stability of future cashflows, level of interest rates, asset structure, growth, need for outside capital, risk, lenders' attitude towards a firm and the advantage of debt.

Kiogora (2000) carried out a notable research. She set out to establish the nature of capital structures employed by companies quoted on the NSE especially whether the capital structure differs by industry category and whether the firms in the same sector have similar capital structure hence lending support to the existence of optimal capital structure. The results indicated that there were differences in capital structure among industry groupings and that firms within a given sector tend to cluster towards some target equity to total assets ratio lending support to the existence of optimal capital structure as dictated by market realities. The results of the relationship between capital structure and returns indicate that returns increase with increased leverage also supporting the traditional view on capital structure.

An alternative argument is that firm size can be viewed as a proxy for information asymmetry between the firm and market. It's thought that the larger the firm the more the information that is available for it and the lower the cost caused by information asymmetries, ceteris paribus. In turn this too will suggest a positive relationship between size and debt, both long term and short term, ceteris paribus.

On the other hand, a number of studies have found a negative dependence between size and firm's leverage, indicating that as size increases, the proportion of leverage incurred falls. In turn, this suggests that larger firms have larger agency and

bankruptcy cost. Titman and vessels (1988) suggest that this finding arises from smaller firms using short term finance than their larger counterparts i.e. that smaller firms have higher transaction costs when they issue long term debt/equity.

Altman (1984) investigated the impact of both direst and indirect bankruptcy costs as well as likelihood of bankruptcy of a sample of 12 USA firms retailers (1970-1978) and seven industrial bankruptcies (1975-1978) for both industrial and retailing firms. It was found that in general there was a marked decrease in value of firms in the period prior to bankruptcy, a decrease that was especially acute for industrial corporations.

Significance relationships were found in the cases of industrial classes between operating leverage and size. The relationship between firm size and capital structure was consistent with the findings of Scott (1972) and Scott and martin (1976) but inconsistent with the findings of Ramners, Storehill, wright and Bee Khuzein (1975) who argued that size and industry were not indisputably determinants of firm's capital structure.

According to Chonde (2002) size was calculated as a ratio of sales to total assets of each firm. A weak and negative relationship was arrived at from the empirical analysis between size and leverage. The results suggest that the larger the corporation the lower leverage. The possible explanation of these findings are consistent with Titman and Wessels (1988) but inconsistent with Rajan and Zingales (1995),Hussein (1999),Hirota (1999) among others.

Size which was measured by turnover divided by total assets of all firms proved negatively correlated with capital structure at an insignificant and very low level. Previous research on financial structures shows a positive relationship between size and leverage .The argument is that as the firm grows bigger it becomes more diversified, have larger debt capacity and a positive link is expected between size and leverage. In this study the results indicate a negative relationship, this might possibly be due to the fact that as firms in the public sector grow in terms of size, they tend to utilize internal funds more and less borrowing. Also how size was

measured by the ratio between turnover and total assets might have influenced the results.

According to Onsomu (2003), debt can be measured using various ratios such as debt /equity; debt/total assets; capital employed/networth .She used debt/equity ratio to ascertain the proportion of debt in the capital structure. She concluded that there is no significant relationship between debt and value of the firm.

Kiogora (2000) did a study that aimed at establishing the nature of capital structure employed by companies quoted on the NSE, specifically whether the capital structure differs per industry category and whether the companies in the same sector have similar capital structure, hence lending support to the existence of optimal capital structure. She used 51 companies for the period between 1991 – 1998.The results were that there are indeed differences in capital structure among industry groupings and that firm within a given sector tend to cluster towards some target equity/total assets ratio. The results of the relationship between capital structure and returns indicate that returns increase with increased leverage hence supporting the traditional view of capital structure.

The studies above have used ratio of sales to total assets of a firm (Chonde, 2002), book value of equity (kiogora,2000), number of employees (Kiamere,1987) as proxy for firm size. This study will use natural logarithm of turn over as proxy for firm size to try and resolve the conflicting results since this will smoothen the variations over the periods considered.

CHAPTER THREE

3.0 Research Methodology

3.1 Introduction

This section provides information about the research design, source of data, population and sample size, measurement of the variables and data analysis.

Panel regression model is used for the estimation in this study. Panel data, also called longitudinal data or cross-sectional time series data, are data where multiple cases (people, firms, countries etc) were observed at two or more time periods. Panel data involves the pooling of observations on a cross-section of units over several time periods.

The panel regression model is used to estimate the relationship between the firm level characteristic i.e. size (SZ) and capital structure measured by long-term debt and short-term debt to equity ratios.

3.2 Research Design

The correlation research design is used in the study. A correlation research design is a quantitative method of research in which you have two or more quantitative variables from the same group of subjects and you are trying to find out if there is a relationship between the two variables. Causality cannot be inferred as it can only be done in an experimental design where variable manipulation is done. Although correlation can not prove a causal relationship, it can be done for prediction, to support a theory or to measure test-pretest reliability.

3.2 Model Specification

The general form of the model can be specified as:

$Y_{it} = \alpha + \beta X_{it} + e_{it}$

with the subscript *i* denoting the cross-sectional dimension and *t* representing the time series dimension. The left-hand variable, Y_{it}, represents the dependent variable in the model, which is the firm's debt to equity ratio at time t. X_{it} contains the explanatory variable in the estimation model, which is the size of a firm in time t, **a** is the constant or intercept and β represents the coefficient i.e. the slope or change in Y given one unit change in X_{it}, e is the error term. The error term captures the effects of all omitted variables. The studies done reveal that results of all other variables but size of a firm are unambiguous hence the model has size as the only independent variable.

The model uses size of the firm (SZ) as the independent variable to determine the capital structure, D/E (the dependent variable). Size (SZ) of the firm is measured by taking the natural log of the sales to smoothen the variation over the periods considered. Capital structure, which is the dependent variable, is defined in terms of debt to equity ratio. This is given as the ratio of debt divided by total equity of the firm.

3.3 Source of Data.

This study is based on secondary data. The data is obtained from published financial statements of the listed firms under study and contained in the Nairobi Stock Exchange (NSE) hand book for the years 2002 to 2007.

3.4 Population

All firms listed on the Nairobi Stock Exchange (NSE) during the six-year period, 2002–2007 form the population of the study. Firms that are suspended from trading their shares and firms from the Finance and Investment sector are omitted. Thirty one (31) firms, from the Main investment market segment i.e. Agricultural, Commercial and Services, Industrial and allied sector and the Alternative Investment Market Segment form the study population.

3.5 Data Analysis

Simple regression analysis is used to analyse the data since only one dependent and one independent variable will be used. Coefficient of Determination, R^2,derived from the regression analysis is used to show the amount of variation explained by the independent variable. In addition, correlation coefficient (r) is used in the data analysis to show the magnitude of the relation between the variables, if any, and the direction of the relationship between the two variables. The probability t- test i.e p>|t|, is used in the study for significance testing. The variables under study are the sources of funds (debt and equity) and turnover (sales revenue).To test the hypotheses, a 0.05 significant level (95% confidence level) was used. The STATA statistical package and the regression Analysis model in the form of Y=a+bX are used to analyse the data.

Chapter Four

4.0 Analysis and Findings

The estimates for the parameters of measurement model are presented in table1 and 2 at the appendix. The estimation method used in the study is the Generalised Least Square (GLS) and not the Ordinary Least Squares (OLS).This was to avoid the problem of heteroskadasticity. The number of observations made was 186 while the number of groups, derived from the number of years considered for each firm, was 6 as shown in table 2 in the appendix. Generally, the results show that the indicator variable measured the underlying attribute, i.e. debt/equity (capital structure), well.

The direction of the effect for the indicator variable is generally in accord with theoretical predictions and this is supported by the significant parameter estimates. Its reasonable to conclude that the indicator variable captured the construct which was hypothesized to be a determinant of capital structure, hence it could be appropriate to consider the impact of this determinant on financial leverage(structural medel).This is in general agreement with the conclusion reached by Titman and Wessels,(1988),Smith and Wanner,(1979),Friend and Hansbrouck,(1988),Crutchly and Hansen,(1989) who found a positive significant cross-section relationship.

The natural logarithm of turnover coefficient of 0.1028 shows that for any unit increase in turnover, leverage increases by 10.28%.This result supports the diversification cost effect of firm size, that is, larger firms demonstrate increased leverage and hence are able to include more debt in their capital structure. This result also supports the view of size as an inverse proxy for the probability of bankruptcy that motivates the use of debt financing. From the probability t-test, i.e. p>|t|, in table 2, testing the level of significance at 95% and 90% confidence level reveals that natural log of turnover, which is the proxy for size of a firm ,is significant i.e. 5%<2%<10% whereas the constant is significant at 10% significance level but insignificant at 5% significance level i.e. 5%<9%<10%.In addition, the

calculated F statistic in table 2 of 0.0942 is less than the critical of .19 hence the significance of the model.

From table 3,firm size, proxied as natural logarithm of turnover, accounts for 25.47% of the changes in capital structure, proxied as debt to equity ratio. This implies that the other factors excluded from the model account for 74.26% of the changes in capital structure. This shows that firm size is a major determinant of capital structure as envisaged in the static trade off theory and in the disciplining effect of debt in the agency theory. Trade off theory suggests that firm size should matter in deciding an optimal capital structure because bankruptcy costs constitute a small percentage of the total firm value for larger firms and greater percentage of the total firm value for smaller firms. As debt increases the chances of bankruptcy, hence smaller firms should have lower debt ratio

The correlation matrix in table 5 shows that there is a positive correlation between debt ratio and natural logarithm of turnover as evidenced by the variance covariance value of 0.0932.

4.1 Industry Classification

Table showing leverage levels of firms

observations	Sector	mean	maximum	minimum	Standard deviation
24	Agriculture	0.308938	0.637537	0.250553	0.153583
41	Comm. & Sevices	0.37507	1.778974	0	0.500748
89	Indus. & Allied	0.412234	8.878549	0	1.026449
30	AIMS	0.561189	11.14806	0	2.005778

Source: Stata statistical package

From above table, on average, the agricultural sector is deemed to use the least debt followed by commercial and services sector, then Industrial and services sector while firms within the alternative market segment are deemed to have the highest leverage. On individual firm basis, a firm with highest level of leverage lies in the AIMS while all sectors except agricultural sector have a firm which are unlevered.

Table showing Size of firms:

Observation	Sector	Mean	Maximum	Minimum	Std. Deviation
24	Agriculture	14.23696	15.35855	13.40879	0.652467
41	Comm. & Services	15.069	17.91678	12.9871	1.288921
89	Industrial& Allied	15.54115	17.76987	12.48079	1.472883
30	AIMS	12.70425	15.19801	10.52415	1.39514

Source: Stata statistical package.

From the table above, on average, Industrial and allied sector has the biggest firms while AIMS has the smallest. On individual basis, Commercial and services sector has the biggest firm while AIMS has the smallest firm.

The summary descriptive statistics for all the observations.

Variable	Mean	Standard Deviation
Debt/equity	0.4169159	1.093095
LnTurnover	14.81222	1.672778

Source:Stata statistical package.

Chapter Five

5.0 Summary of Findings

The findings of this study indicate that the mean debt/equity levels of firms listed on the NSE average to 0.4169159 which implies that most firms listed on the NSE are financed by equity. The possible explanation is that most companies raise their funds by selling shares to the public. However, firms have started floating debt instruments like commercial papers and bonds. This might reverse the mean of debt/equity in future as investors prefer the more secure debt instruments. From table 3, a generic model of capital structure for Kenyan firms can be specified as Y_{it}=-1.106542+ 0.1028514X_{it} +e

The level of correlation is 0.1028514 indicating that there is a strong association between debt ratio and size of a firm. This model implies that for any firm listed on the NSE, given the value of size and using the constant -1.106542, you will be able to determine the debt ratio of that firm. Size, which is measured as the natural log of Turnover of the listed firms proved positively correlated with capital structure at a significant level. This, as previous research on capital structure show, is because as a firm becomes bigger, it becomes more diversified, less risky and thus less prone to bankruptcy.

In conclusion, since firms strive to maximize their value, they should use more debt in their financing. However, this introduces the risks of bankruptcy. These costs make it unlikely that a firm will push its debt equity ratio very high. If we take the bankruptcy costs into account, then there may be an optimal capital structure where the marginal tax advantage equals the marginal bankruptcy costs. Note that the marginal bankruptcy costs may be different across firms. This may explain why all firms do not have the same level of debt-equity. Direct bankruptcy costs appear to constitute a larger proportion of a firm's value as that value decreases. It is also the case that relatively large firm tend to be more diversified and less prone to

bankruptcy. These arguments suggest that large firms should be more highly leveraged. In addition, the disciplining effect of debt helps to reduce the agency costs in a firm.

5.1 Limitations of the Study

a) Only 31 firms, which had annual report and financial statements for 6 years between 2002 and 2007, were used in the study. Those that had been suspended during the period or were listed on the NSE after 2002 were omitted from the study. Firms not listed on the NSE were also omitted from the study. It's therefore difficult to generalize the results from this analysis to be representative of all firms.

b) The period chosen was assumed to be normal i.e. after the 2002 general elections when a different Government regime came into power and 2007 just before the general elections. The market conditions after the 2007 general elections changed hence the time frame chosen may not enable the researcher to draw generalized conclusions of the current performance of firms listed on the NSE.

5.2 Suggestions for Further Research

A comparative study on the determinants of capital structure for unlisted firms and listed firms should be carried out to evaluate the robustness of the results obtained from studies conducted on determinants of capital structure for listed firms.

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APPENDIX 1

FIRMS LISTED ON THE NSE

Agriculture

1. Unilever Tea (k) Ltd
2. Rea Vipingo Ltd.
3. Sasini Tea & Coffee Ltd
4. Kakuzi Ltd

Commercial and services

1. Marshalls E.A Ltd
2. Kenya Airways Ltd
3. CMC Holdings Ltd
4. Nation Media Group Ltd
5. TPS (Serena) Ltd
6. Standard Group Ltd

Industrial and Allied

1. Athi River Mining Ltd
2. British American Tobacco Kenya Ltd
3. Olympia Capital Holdings Ltd
4. E.A Cables Ltd
5. Sameer Africa Ltd
6. Kenya Oil Ltd
7. Mumias Sugar Firm Ltd
8. Bamburi Cement Ltd
9. Crowm berger (K) Ltd
10. E.A Portland Cement Co. Ltd
11. Kenya Power and Lighting Co. Ltd
12. Total Kenya Ltd
13. Kengen Ltd

Alternative Investment Market Segment

1. A. Bauman & Co.
2. Express
3. Williamson Tea Kenya
4. Kapchorua Tea Co.
5. Limuru Tea Co.

APPENDIX 2

Table 1

summarize debtequity- lnturnover

Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
debtequity	186	.4169159	1.093095	0	11.14806
lnturnover	186	14.81222	1.672778	10.52415	17.91768

Table 2

Hausmanf ixed effect regression

browse debtequity lnturnover

. xtreg debtequity lnturnover, fe

Fixed-effects (within) regression — Number of obs = 186
Group variable: year — Number of groups = 6

R-sq: within = 0.0290 — Obs per group: min = 31
between = 0.2547 — avg = 31.0
overall = 0.0229 — max = 31

F(1,179) = 5.34
corr(u_i, Xb) = -0.0737 — Prob > F = 0.0220

debtequity	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnturnover	.1095713	.0474313	2.31	0.022	.015975	.2031677
_cons	-1.206079	.7069317	-1.71	0.090	-2.601071	.188913

sigma_u	.26662552
sigma_e	1.0702547
rho	.05843582 (fraction of variance due to u_i)

F test that all u_i=0: F(5, 179) = 1.91 — Prob > F = 0.0942

Table 3

Hausman random effect of regression

. xtreg debtequity lnturnover, re

```
Random-effects GLS regression                   Number of obs      =       186
Group variable: year                            Number of groups   =         6

R-sq:  within  = 0.0290                         Obs per group: min =        31
       between = 0.2547                                        avg =      31.0
       overall = 0.0229                                        max =        31

Random effects u_i ~ Gaussian                   Wald chi2(1)       =      4.73
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0297

------------------------------------------------------------------------------
  debtequity |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  lnturnover |   .1028514   .0473089     2.17   0.030     .0101276    .1955752
       _cons |  -1.106542   .7078275    -1.56   0.118    -2.493858    .2807749
-------------+----------------------------------------------------------------
     sigma_u |  .15019069
     sigma_e |  1.0702547
         rho |  .01931267   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Table 4

comparison of hausman fixed and random effect

```
 estimates store random_effects

. estimates store fixed_effects

. hausman random_effects fixed_effects

                ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |  fixed_effe~s  random_eff~s    Difference          S.E.
-------------+----------------------------------------------------------------
  lnturnover |    .1028514     .1028514            0                0
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg
```

Note: there is no difference between the fixed and random effect hance either can be used.

Table 5

covariance Matrix

```
   |     year debteq~y lnturn~r _est_p~l _est_r~s _est_f~s
-------------+------------------------------------------------------
```

year |	1.0000		
debtequity |	0.0183	1.0000	
lnturnover |	0.1431	0.0932	1.0000

Table 6

Summary statistics agricultural sector

	LNTURNOVER	DEBTEQUITY
Mean	14.23696	0.308938
Median	14.03933	0.250553
Maximum	15.35855	0.637537
Minimum	13.40879	0.134313
Std. Dev.	0.652467	0.153583
Skewness	0.804	1.046614
Kurtosis	2.163298	2.721807
Jarque-Bera	3.285733	4.458996
Probability	0.193425	0.107582
Sum	341.687	7.414505
Sum Sq. Dev.	9.791408	0.542518
Observations	24	24

Table 7

Summary statistics commercial and Services Sector

	DEBTEQUITY	LNTURNOVER
Mean	0.37507	15.069
Median	0.135907	14.90226
Maximum	1.778974	17.91768
Minimum	0	12.9871
Std. Dev.	0.500748	1.288921
Skewness	1.620439	0.783376
Kurtosis	4.322665	2.914221
Jarque-Bera	20.93176	4.206035
Probability	0.000028	0.122087
Sum	15.37786	617.8289
Sum Sq. Dev.	10.02993	66.45273
Observations	41	41

Table 8

Summary statistics industrial & Allied Sector

	DEBTEQUITY	LNTURNOVER
Mean	0.412234	15.54115
Median	0.127514	15.98507
Maximum	8.878549	17.76987
Minimum	0	12.48079
Std. Dev.	1.026449	1.472883
Skewness	6.621687	-0.408811
Kurtosis	53.58007	2.053187
Jarque-Bera	10137.59	5.80339
Probability	0	0.05493
Sum	36.68886	1383.162
Sum Sq. Dev.	92.71657	190.9057
Observations	89	89

Table 9

Summary statistics Alternative Investment Market Segment

	LNTURNOVER	DEBTEQUITY
Mean	12.70425	0.561189
Median	12.95171	0.192983
Maximum	15.19801	11.14806
Minimum	10.52415	0
Std. Dev.	1.39514	2.005778
Skewness	-0.031775	5.148604
Kurtosis	1.781513	27.6883
Jarque-Bera	1.860937	894.4306
Probability	0.394369	0
Sum	381.1274	16.83568
Sum Sq. Dev.	56.44604	116.6712
Observations	30	30

APPENDIX 3

List of the 186 observations

Main Investment Market Segment (MIMS)

AGRICULTURAL SECTOR

1 UNILIVER TEA (K) Ltd

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove
2002	871,155.00	3,307,882.00	4,251,285.00	0.263357	15.26273
2003	743,119.00	3,124,483.00	3,975,876.00	0.237837	15.19576
2004	742,743.00	3,140,836.00	4,656,109.00	0.236479	15.35369
2005	825,109.00	3,069,520.00	4,678,783.00	0.268807	15.35855
2006	866,908.00	3,140,943.00	4,244,832.00	0.276002	15.26121
2007	699,989.00	2,672,067.00	4,303,763.00	0.261965	15.275

Source: Annual Report and Financial Statements

2 Rea Vipingo Ltd

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove
2002	176,154.00	451,391.00	665,830.00	0.390247	13.40879
2003	168,506.00	468,253.00	697,391.00	0.359861	13.4551
2004	169,478.00	575,807.00	873,408.00	0.294331	13.68016
2005	148,085.00	619,239.00	1,104,363.00	0.23914	13.91478
2006	126,247.00	652,372.00	1,181,207.00	0.19352	13.98205
2007	106,129.00	790,165.00	1,232,980.00	0.134312	14.02494

Source: Annual Report and Financial Statements

3 Sasini Tea and Coffee Ltd

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove
2002	394,792.00	1,754,912.00	848,445.00	0.224964	13.65116
2003	402,781.00	1,695,910.00	858,171.00	0.237501	13.66256
2004	590,503.00	3,138,077.00	1,039,639.00	0.188174	13.85438
2005	424,910.00	2,697,425.00	931,567.00	0.157524	13.74462
2006	504,175.00	2,936,955.00	1,268,959.00	0.171666	14.05371
2007	473,219.00	2,868,149.00	1,325,354.00	0.164991	14.09719

Source: Annual Report and Financial Statements

4 Kakuzi Ltd

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove
2002	407,663.00	1,797,252.00	1,082,190.00	0.226826	13.8945
2003	642,188.00	1,007,295.00	1,310,780.00	0.637537	14.08613

2004	652,447.00	1,090,350.00	1,424,503.00	0.598383	14.16933
2005	498,544.00	910,218.00	1,110,348.00	0.547719	13.92018
2006	625,245.00	1,043,269.00	1,399,194.00	0.599313	14.15141
2007	638,078.00	1,265,916.00	1,512,118.00	0.504045	14.22902

Source: Annual Report and Financial Statements

Commercial and Services sector

5 **Car & General**

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove
2002	29,281.00	298,614.00	436,741.00	0.098056	12.9871
2003	23,974.00	354,816.00	489,308.00	0.067567	13.10075
2004	29,436.00	398,442.00	629,100.00	0.073878	13.35205
2005	119,619.00	603,358.00	1,061,742.00	0.198255	13.87542
2006	160,461.00	732,497.00	1,244,403.00	0.21906	14.03417
2007	189,960.00	886,599.00	1,846,523.00	0.214257	14.42881

Source: Annual Report and Financial Statements

6 **Marshalls E.A Ltd**

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove
2002	-	353,016.00	1,424,543.00	0	14.16936
2003	-	202,379.00	1,652,221.00	0	14.31763
2004	-	224,635.00	1,273,874.00	0	14.05757
2005	178,783.00	288,461.00	1,261,640.00	0.619782	14.04792
2006	142,205.00	333,161.00	1,304,988.00	0.426836	14.0817
2007	191,668.00	462,982.00	1,291,845.00	0.413986	14.07158

Source: Annual Report and Financial Statements

7 **Nation Media Group**

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove
2002	60,300.00	2,331,600.00	4,103,400.00	0.025862	15.22733
2003	45,900.00	2,781,400.00	4,469,100.00	0.016502	15.3127
2004	10,600.00	2,856,800.00	4,866,200.00	0.00371	15.39782
2005	37,100.00	3,230,700.00	5,597,100.00	0.011484	15.53776
2006	358,900.00	3,496,700.00	6,339,200.00	0.10264	15.66226
2007	267,200.00	3,736,300.00	7,685,600.00	0.071515	15.85486

Source: Annual Report and Financial Statements

8 **CMC Holdings Ltd**

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove
2002	127,689.00	1,140,745.00	4,552,390.00	0.111935	15.33116
2003	312,661.00	2,300,559.00	4,493,092.00	0.135907	15.31805

2004	393,699.00	2,735,401.00	6,048,231.00	0.143927	15.61528
2005	307,115.00	3,035,218.00	6,810,705.00	0.101184	15.73401
2006	349,865.00	3,542,025.00	7,362,964.00	0.098775	15.81197
2007	361,080.00	3,889,267.00	7,590,345.00	0.09284	15.84239

Source: Annual Report and Financial Statements

9 Kenya Air Ways Ltd

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove
2002	9,756,000.00	7,379,000.00	27,461,000.00	1.32213	17.12828
2003	13,502,000.00	8,438,000.00	30,421,000.00	1.600142	17.23064
2004	18,490,000.00	12,340,000.00	42,234,000.00	1.498379	17.55874
2005	25,358,000.00	18,459,000.00	50,035,000.00	1.373747	17.72823
2006	38,497,000.00	21,640,000.00	58,792,000.00	1.778974	17.88952
2007	34,381,000.00	25,873,000.00	60,471,000.00	1.328837	17.91767

Source: Annual Report and Financial Statements

10 TPS (Serena) Ltd

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove
2002	324,955.00	1,021,130.00	1,450,158.00	0.318231	14.18718
2003	313,627.00	1,003,660.00	1,217,130.00	0.312483	14.01201
2004	242,017.00	1,091,639.00	1,672,490.00	0.221701	14.32982
2005	653,365.00	1,240,964.00	1,969,769.00	0.526498	14.49343
2006	1,960,039.00	3,403,992.00	3,264,006.00	0.575806	14.99847
2007	1,652,948.00	3,678,411.00	3,667,660.00	0.449365	15.11506

Source: Annual Report and Financial Statements

11 Standard Group Ltd

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove
2002	89,390.00	149,152.00	1,321,611.00	0.599321	14.09436
2003	8,994.00	302,778.00	1,452,173.00	0.029705	14.18857
2004	17,685.00	289,625.00	1,762,993.00	0.061062	14.38252
2005	2,335.00	362,613.00	1,987,670.00	0.006439	14.50247
2006	72,163.00	567,870.00	2,964,610.00	0.127077	14.90226
2007	587,081.00	792,455.00	2,608,218.00	0.740838	14.77418

Source: Annual Report and Financial Statements

Industrial and Allied sector

12 Athi River Mining Ltd

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove

2002	176,765.00	862,802.00	1,126,385.00	0.765992	13.93452
2003	309,715.00	964,110.00	1,240,388.00	0.777265	14.03093
2004	332,147.00	1,039,227.00	1,639,508.00	0.633865	14.30991
2005	1,508,230.00	1,209,969.00	2,208,724.00	0.547814	14.60793
2006	1,798,138.00	1,374,492.00	2,605,032.00	0.52763	14.77296
2007	1,638,686.00	1,771,984.00	3,881,736.00	0.456493	15.17179

Source: Annual Report and Financial Statements

13 BAT (K) Ltd

year	Debt	Equity	Turnover	Debt/Equity	LN Turnove
	Kshs'000	Kshs'000	Kshs'000		
2002	505,124.00	4,110,810.00	9,422,530.00	0.122877	16.05861
2003	485,906.00	4,200,831.00	9,446,056.00	0.115669	16.06111
2004	514,580.00	3,761,025.00	9,865,047.00	0.136819	16.10451
2005	561,327.00	3,893,063.00	11,263,628.00	0.144186	16.23709
2006	668,048.00	4,194,485.00	12,669,489.00	0.159268	16.35471
2007	1,003,639.00	4,693,250.00	15,770,234.00	0.213847	16.57363

Source: Annual Report and Financial Statements

14 Olympia Capital Holdings Ltd

year	Debt	Equity	Turnover	Debt/Equity	LN Turnove
	Kshs'000	Kshs'000	Kshs'000		
2002	40,709.00	96,489.00	263,232.00	0.421903	12.48079
2003	31,487.00	136,021.00	274,450.00	0.231486	12.52252
2004	21,394.00	198,463.00	291,887.00	0.107798	12.58412
2005	15,158.00	183,044.00	291,225.00	0.082811	12.58185
2006	106,687.00	200,571.00	396,760.00	0.531916	12.89109
2007	76,798.00	675,082.00	1,366,927.00	0.113761	14.12808

Source: Annual Report and Financial Statements

15 E.A Cables Ltd

year	Debt	Equity	Turnover	Debt/Equity	LN Turnove
	Kshs'000	Kshs'000	Kshs'000		
2002	13,311.00	246,017.00	388,008.00	0.054106	12.86878
2003	13,592.00	249,009.00	428,430.00	0.054584	12.96788
2004	10,178.00	317,042.00	825,316.00	0.032103	13.62352
2005	32,432.00	589,086.00	1,162,041.00	0.055055	13.96569
2006	322,641.00	805,010.00	2,040,533.00	0.400791	14.52872
2007	661,276.00	1,102,345.00	34,622,139.00	0.599881	17.36

Source: Annual Report and Financial Statements

16 Sammer Africa Ltd

year	Debt	Equity	Turnover	Debt/Equity	LN Turnove
	Kshs'000	Kshs'000	Kshs'000		

2002	96,066.00	1,989,431.00	2,736,539.00	0.048288	14.8222
2003	33,200.00	1,909,581.00	2,538,316.00	0.017386	14.74701
2004	16,851.00	2,012,290.00	3,270,254.00	0.008374	15.00038
2005	39,274.00	2,028,470.00	3,359,010.00	0.019361	15.02716
2006	103,881.00	1,850,986.00	3,171,049.00	0.056122	14.96957
2007	40,074.00	1,961,922.00	3,469,283.00	0.020426	15.05946

Source: Annual Report and Financial Statements

17 Kenol Ltd

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove
2002	274,057.00	2,149,225.00	13,317,933.00	0.127514	16.40462
2003	234,197.00	2,398,935.00	16,658,516.00	0.097625	16.62843
2004	288,785.00	3,392,935.00	34,478,830.00	0.085114	17.35586
2005	271,314.00	4,018,797.00	37,536,818.00	0.067511	17.44083
2006	399,572.00	4,672,903.00	46,381,292.00	0.085508	17.65241
2007	301,542.00	5,007,469.00	52,162,477.00	0.060218	17.76987

Source: Annual Report and Financial Statements

18 Mumias Sugar Co. Ltd

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove
2002	1,289,978.00	5,065,115.00	7,847,233.00	0.254679	15.87567
2003	1,231,643.00	4,859,056.00	7,628,937.00	0.253474	15.84746
2004	1,213,346.00	5,402,165.00	9,792,503.00	0.224604	16.09713
2005	1,167,164.00	6,080,035.00	10,080,174.00	0.191967	16.12608
2006	1,911,416.00	7,709,049.00	11,657,540.00	0.247944	16.27146
2007	1,900,774.00	8,337,660.00	10,381,190.00	0.227975	16.15551

Source: Annual Report and Financial Statements

19 Total Kenya Ltd

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove
2002	-	3,420,122.00	16,239,994.00	0	16.60299
2003	-	4,122,404.00	22,318,219.00	0	16.92091
2004	-	4,522,751.00	37,628,109.00	0	17.44326
2005	-	4,616,649.00	40,547,536.00	0	17.51799
2006	-	4,665,064.00	38,052,875.00	0	17.45449
2007	-	4,751,591.00	44,109,728.00	0	17.60219

Source: Annual Report and Financial Statements

20 Bamburi Cement Ltd

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove

2002	2,121,000.00	9,035,000.00	7,687,000.00	0.234754	15.85504
2003	1,987,000.00	9,874,000.00	10,527,000.00	0.201236	16.16945
2004	2,134,000.00	10,485,000.00	12,427,000.00	0.203529	16.33538
2005	1,932,000.00	11,281,000.00	15,142,000.00	0.171261	16.53298
2006	1,900,000.00	13,736,000.00	16,488,000.00	0.138323	16.61814
2007	1,951,000.00	15,075,000.00	22,111,000.00	0.12942	16.91159

Source: Annual Report and Financial Statements

21 Crown Berger (K) td

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove
2002	67,388.00	555,952.00	1,090,626.00	0.121212	13.90226
2003	49,096.00	578,337.00	1,028,278.00	0.084892	13.8434
2004	43,723.00	591,606.00	1,069,174.00	0.073906	13.8824
2005	71,937.00	646,669.00	1,442,439.00	0.111242	14.18185
2006	116,478.00	770,953.00	1,689,630.00	0.151083	14.34002
2007	102,678.00	813,869.00	2,089,988.00	0.12616	14.55267

Source: Annual Report and Financial Statements

22 E.A Portland Cement Ltd

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove
2002	4,381,456.00	1,897,111.00	3,207,060.00	2.309541	14.98087
2003	3,988,255.00	2,151,656.00	3,842,138.00	1.853575	15.16154
2004	4,171,759.00	1,802,463.00	4,166,289.00	2.314477	15.24254
2005	4,145,899.00	2,252,835.00	5,363,196.00	1.840303	15.49507
2006	4,109,011.00	3,076,933.00	6,180,715.00	1.335424	15.63694
2007	3,393,896.00	3,607,097.00	6,402,736.00	0.940894	15.67224

Source: Annual Report and Financial Statements

23 KPLC Co.Ltd

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove
2002	5,049,326.00	3,516,168.00	24,807,649.00	1.436031	17.02666
2003	5,494,863.00	618,892.00	23,130,782.00	8.878549	16.95667
2004	3,769,347.00	17,491,219.00	23,323,083.00	0.215499	16.96495
2005	3,248,936.00	18,898,179.00	28,341,356.00	0.171918	17.15983
2006	2,701,722.00	20,560,405.00	33,966,730.00	0.131404	17.34089
2007	2,268,549.00	19,643,965.00	35,724,768.00	0.115483	17.39135

Source: Annual Report and Financial Statements

24 EABL

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove

2002	751,069.00	11,147,910.00	27,734,679.00	0.067373	17.13819
2003	805,130.00	12,591,122.00	28,918,151.00	0.063944	17.17998
2004	1,212,380.00	15,258,620.00	30,076,665.00	0.079455	17.21926
2005	1,493,842.00	16,892,216.00	19,186,425.00	0.088434	16.76971
2006	1,830,466.00	18,585,570.00	20,906,885.00	0.098489	16.85559
2007	2,051,597.00	20,850,776.00	25,870,696.00	0.098394	17.06862

Source: Annual Report and Financial Statements

25 BOC Kenya Ltd

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove
2002	41,566.00	1,006,873.00	697,505.00	0.041282	13.45526
2003	49,351.00	1,074,556.00	728,720.00	0.045927	13.49904
2004	46,116.00	1,153,363.00	830,675.00	0.039984	13.62999
2005	57,480.00	1,266,661.00	987,138.00	0.045379	13.80257
2006	69,191.00	1,271,846.00	1,109,584.00	0.054402	13.9195
2007	58,165.00	1,317,489.00	1,213,457.00	0.044148	14.00898

Source: Annual Report and Financial Statements

26 Kengen Ltd

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove
2002	29,172,680.00	28,288,163.00	10,252,108.00	1.031268	16.14299
2003	19,779,454.00	46,138,700.00	10,108,769.00	0.428696	16.12891
2004	21,790,423.00	47,815,041.00	8,754,447.00	0.455723	15.98507
2005	23,308,760.00	33,428,760.00	11,011,577.00	0.697267	16.21446
2006	23,234,000.00	36,498,663.00	14,300,600.00	0.636571	16.47581
2007	31,094,483.00	63,638,189.00	14,551,767.00	0.488614	16.49322

Source: Annual Report and Financial Statements

Alternative Investment Market Segment (AIMS)

27 A. Bauman & Co Ltd

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnove
2002	34,553.00	291,682.00	112,749.00	0.118461	11.63292
2003	28,315.00	282,431.00	112,734.00	0.100255	11.63279
2004	18,518.00	264,009.00	107,685.00	0.070142	11.58697
2005	-	146,832.00	101,431.00	0	11.52713
2006	-	104,514.00	103,992.00	0	11.55207
2007	2,663.00	69,019.00	79,019.00	0.038584	11.27744

Source: Annual Report and Financial Statements

28 Express Kenya Ltd

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnover
2002	64,897.00	79,889.00	3,984,859.00	0.81234	15.19801
2003	127,846.00	11,468.00	3,964,581.00	11.14806	15.19291
2004	19,030.00	199,079.00	1,762,203.00	0.09559	14.38208
2005	41,680.00	253,009.00	1,055,414.00	0.164737	13.86944
2006	133,703.00	377,643.00	822,487.00	0.354046	13.62009
2007	123,617.00	444,294.00	922,347.00	0.278232	13.73468

Source: Annual Report and Financial Statements

29 Williamson Tea (K) Ltd

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnover
2002	404,680.00	1,699,303.00	1,010,236.00	0.238145	13.82569
2003	614,801.00	1,667,504.00	837,958.00	0.368695	13.63872
2004	608,263.00	2,359,956.00	855,610.00	0.257743	13.65957
2005	567,535.00	2,422,342.00	1,198,588.00	0.234292	13.99665
2006	512,865.00	2,318,260.00	985,059.00	0.221228	13.80046
2007	640,276.00	2,667,355.00	1,206,528.00	0.240042	14.00326

Source: Annual Report and Financial Statements

30 Kapchorua Tea Co. Ltd

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnover
2002	111,733.00	386,140.00	383,334.00	0.289359	12.85666
2003	107,623.00	404,147.00	413,673.00	0.266297	12.93283
2004	209,916.00	672,645.00	416,059.00	0.312075	12.93858
2005	78,910.00	660,874.00	427,130.00	0.119402	12.96484
2006	191,621.00	654,711.00	462,749.00	0.29268	13.04494
2007	216,674.00	710,646.00	610,303.00	0.304897	13.32171

Source: Annual Report and Financial Statements

31 Limuru Tea

year	Debt Kshs'000	Equity Kshs'000	Turnover Kshs'000	Debt/Equity	LN Turnover
2002	2,787.00	31,477.00	47,654.00	0.088541	10.77172
2003	3,426.00	45,278.00	57,491.00	0.075666	10.95938
2004	3,501.00	45,937.00	56,277.00	0.076213	10.93804
2005	2,170.00	36,778.00	37,203.00	0.059003	10.52414
2006	4,561.00	42,099.00	51,036.00	0.10834	10.84029
2007	3,848.00	37,501.00	54,362.00	0.102611	10.90342

Source: Annual Report and Financial Statements