EFFECT OF CAPITAL STRUCTURE ON FINANCIAL DISTRESS OF NON-FINANCIAL COMPANIES LISTED IN NAIROBI SECURITIES EXCHANGE

ROBERT GITAU MUIGAI

DOCTOR OF PHILOSOPHY

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Robert Gitau Muigai

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

Signature ……. Date ……. …….

Robert Gitau Muigai

This thesis has been submitted for examination with our approval as university supervisors

Signature ……. Date ……

Dr. Tabitha Nasieku

JKUAT, Kenya

Signature ……. Date ……

Dr. Stella Muhanji

Kabarak University, Kenya

DEDICATION

This thesis is dedicated to my family that comprises my lovely wife, Sarah, beautiful daughters: Precious Wanjiru and Angel Nyambura and my son Silver Muigai to whom I remain indebted for their incessant support and prayers.

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ABBREVIATIONS

CBK	Central Bank of Kenya
CMA	Capital Markets Authority
EBIT	Earnings before Interest and Taxes
EPS	Earnings per Share
EVA	Economic Value Added
FGLS	Feasible Generalized Least Squares
IPO	Initial Public Offer
IRA	Insurance Regulatory Authority
JKUAT	Jomo Kenyatta University of Agriculture and Technology
JSE	Johannesburg Stocks Exchange
KPCU	Kenya Planters Cooperative Union
MDA	Multivariate Discriminant Analysis
NSE	Nairobi Securities Exchange
OLS	Ordinary Least Squares
P/E	Price Earning
ROA	Return on Assets
ROE	Return on Equity
VAR	Vector Autoregressive
VIF	Variance Inflation Factor

DEFINITION OF KEY TERMS

Arbitrage: Refers to a trade that profits by exploiting price differences of identical or similar financial instruments, on different markets or in different forms (Barclay, Heitzman, & Smith, 2013).

Asset Structure: is the extent to which corporations retain their asset investment in one form or another (Cuong, 2014).

Capital Structure: Refers to the mix of the different forms of financing employed by firms to finance their business operations (Aggarwal & Kyaw, 2006; Harris & Raviv, 1991)

Debt financing: is a form of financing procured externally by the business with a requirement to be repaid at some future date (Salawu & Ile-Ife, 2007)

Debt Maturity: The period between procurement to repayment of debt capital (Diamond, 1993).

Default: Is the situation in which a firm violates the debt covenant with regard to repayment (Berger & Di Patti, 2006).

Equity financing: The form of business financing supplied by the owners of the business (Pandey, 2009).

Equity Structure: The combination of internally generated funds and externally issued equity used in financing business operations of the firm (Bender, 2013).

Failure: A situation where the realized rate of return on invested capital is significantly lower than the prevailing rates of similar investments (Berger & Di Patti, 2006).

Financial Distress is a situation where a firm is unable to meet the financial obligations as they mature or does so with difficulties. Usually, the phenomenon may be heralded by insufficient cash flows, decline in market value, profit breaches and low growth (Andrade & Kaplan, 1998).

Financial Leverage: Use of fixed charge source of capital in relation to the owners' capital within the capital structure (Muritala, 2012)

Financial Risk: The exposure occasioned to the firm through use of fixed charge source of capital such as debt as opposed to use of equity (Gwatidzo & Ojah, 2014).

Firm Size: Represents how big or small a firm is; usually in terms of investment in assets, turn-over or employment capacity (Babalola, 2013)

Long-term debt: The portion of debt capital that is payable after twelve months of the balance sheet date. Also called non-current debt (Ebaid, 2009)

Optimal Capital Structure: The level of equity and debt financing at which the value of a firm is maximized (Peura & Keppo, 2006).

Sales growth: the change in year-on-year turnover realized by the firm (Cuong, 2014).

Short term debt: The portion of debt capital that becomes payable within twelve months of the reporting date (Ebaid, 2009).

Tangibility: The extent to which corporations retain their asset investment in fixed form (Cuong, 2014)

ABSTRACT

Since independence, Kenya has witnessed numerous cases of financial distress among non-financial firms. This has been evidenced by some firms undertaking financial restructuring and others been placed under receivership and subsequently delisted. This situation does not only lead to loss of investors' wealth but also erode confidence in the capital market. This study sought to investigate the effect of capital structure on financial distress of non-financial companies listed in NSE. Different from the previous studies that have mainly determined the effect of capital structure based on financial performance measures such as profitability, liquidity and firm value, this study focused directly on financial distress. In accomplishing this overall objective, the study sought to establish the effect of financial leverage, debt maturity, equity structure and asset structure on financial distress of non-financial firms. In addition, the study investigated the moderating effect of firm size and the listing sector on the relationship between capital structure and financial distress of the firms. The study employed secondary data extracted from audited financial statements and annual reports of individual companies for the ten - year period covering 2004 – 2013 (both years inclusive). The study was undertaken using quantitative research design. A census of all the 41 non-financial companies listed in NSE as at December 2013 constituted target population. Descriptive statistics and panel regression analysis techniques were used to analyze the data. F-test was used to determine the significance of the overall model; while significance of individual variables was determined by t-test. The study concluded that financial leverage, asset tangibility and external equity have a significant negative effect on financial distress of non-financial firms. Nevertheless, internal equity and long term debt play a significant role in mitigating financial distress in non-financial firms. The study further concluded that the firm size and the listing sector have significant moderating effect on the relationship between capital structure and financial distress. Based on these findings, the study recommends that in financing their firms, corporate managers should adopt appropriate mix of different capital sources necessary to mitigate financial distress of the firms. Particularly, long term debt and internal equity should be employed while

debt should be applied sparingly. In addition, corporations should avoid maintaining large proportions of their asset investment in illiquid (fixed) form as this ties up significant portion of productive capital. At policy level, the study recommends that policy makers should initiate policies aimed at lowering the cost of debt financing and at the same time encourage non-financial firms to plough back much of their profits to finance the operations.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Capital structure constitutes the mix of the different forms of financing employed by the firm to fund operations (Fabozzi & Drake, 2009). According to Pandey (2009), equity and debt comprise the principal components of capital structure and represents the major claims on the corporations' assets. Financial distress on the other hand has been defined as the situation where the firm is unable to meet its financial obligations as they fall due or does so with difficulties (Andrade & Kaplan, 1998). According to Whitaker (1999), financially distressed firms are generally associated with insufficient cash flows, volatile profitability and decline in assets-liability ratio. According to Rajan and Zingales (1995), the financing factor plays a critical role in determining not only the interim financial performance of the firm but also its long run survival.

In studying the effect of capital structure on corporations, trade-off theory and pecking order hypotheses have been postulated as the two main schools of thought. The tradeoff theory, propounded by Myers (1977) argue that employment of debt financing is generally beneficial as a result of the associated tax-savings cash flows. Proponents of this hypothesis opine that the present value of the resultant cash flows increases the overall firm value and improves corporate financial stability. However, theorist note that persistent employment of debt also increases their probability of financial distress. The theory therefore advocates for existence of optimal capital structure which encompasses the equilibrium mix of debt and equity financing.

The Pecking order theory, on the other hand provide for hierarchical order of preference for different sources of capital available to the firm. According to Myers and Majluf (1984), companies prefer internal capital ahead of external financing. The theorists argued that internal capital is beneficial to the firm since it portends less costs of

information asymmetry between insiders and potential investors. The theory assert that only when internal sources are depleted that firms exploit the less risky form of external financing such as low-cost debt and subsequently external equity. The theory is therefore instrumental in advancing the argument that different components of capital structure affect corporate financial distress differently. It is however notable that although the theory does not explicitly uphold existence of optimal capital structure, it advocates for the need of managers to balance between different sources of capital necessary to preserve financial stability.

1.1.1 Capital Structure and Corporate Financial Distress

Over the past decades, the world has with devastating effects witnessed numerous cases of financial distress and subsequent failure among globally reputed corporations. These entities that include: General Motors (2009), Swissair (2001), The CIT Group (2009), Conseco (2002), Pacific Gas & Electric Ltd (2001), Delta Air lines (2005), Parmalat (2003), Enron (2001) and WorldCom (2002) represented the icons of corporate financial stability prior to filing for bankruptcy. Their collapse therefore came with tremendous amazement to researchers, analysts and industry practitioners alike. This undesirable phenomenon motivated finance scholars to commence research aimed at examining the underlying causes of firm failure.

According to Outecheva (2007), corporate financial distress is mainly attributed to poor governance, severe competition, adverse economic factors and the capital structure. Parker, Peters, and Turetsky (2002) found that poor corporate governance that encapsulate mismanagement precipitates fraud and corruption and ultimately drive firms into financial failure. In their study, Kapopoulos and Lazaretou (2007) found that severe industry competition leads to decline in sales turnover and hence reduced profitability for the affected firms. The authors argued that if the situation is sustained, the firm suffers from liquidity shortages that culminate in financial distress. In addition, Whitaker (1999) found that prolonged period of adverse economic conditions such as

high market interest rates provide an uncomfortable environment for businesses to operate. The author opined that this situation is a recipe for firm failure as it makes it difficult for firms to achieve the budgeted profitability levels.

However, review of literature show that while subsequent studies have consistently concluded that poor governance, severe competition and adverse economic factors are significant contributors of financial distress, the effect of capital structure has been debatable. Studies undertaken by Andrade and Kaplan (1998), Gupta, Srivastava, and Sharma (2014) and Chen (2004) have provided evidence that use of debt financing increases corporate financial distress. However, the findings of these studies are at variance with the findings of studies carried out by Shehla Akhtar, Javed, Maryam, and Sadia (2012), Ogbulu and Emeni (2012) and Ogundipe, Idowu, and Ogundipe (2012) that found use of leverage to mitigate corporate financial distress. On the other hand, studies taken by Ebaid (2009) and Modigliani and Miller (1958) concluded that the way firms are financed does not affect the failure process.

These conflicting empirical results could be explained by the fact that the studies have been based on specific financial distress indicators such as profitability, liquidity, firm value and investment growth. A major limitation of these studies is that by using single indicators of financial distress, the findings only provide short run information which may change with time. This is in contrast with Sundararajan *et al*. (2002) who opined that financial distress provides information concerning the overall financial health of the firm and is therefore a good indicator of firm quality. Given this situation, it is necessary to undertake an incisive study aimed at investigating the effect of capital structure on financial distress directly.

1.1.2 Capital Structure of Non-financial Firms Listed in Kenya

Nairobi Securities Exchange (NSE) is the sole body mandated to list corporations in Kenya. Incorporated in 1954, NSE is a body corporate established under the Companies

act (CAP 486) of the laws of Kenya and comprise of the licensed stock brokers as the shareholders. While NSE is also publicly listed, it is mandated to facilitate and supervise transactions carried out by investors of the listed companies. Another player in the Kenyan capital market is the Capital Markets Authority (CMA). Formed in 1989, CMA is charged with the role of regulating and licensing capital market players such as stock brokers, the securities exchange (NSE) and the listed entities. As at 31st December 2013, 64 firms were listed in NSE across 10 sectors that included: Agriculture, Automobiles & accessories, Commercial & services, Energy & Petroleum, Banking, Insurance, Investments, Manufacturing & Allied, Construction and allied and Telecommunication & Technology (CMA annual report, 2014). Among the listed firms, 22 were within the banking and insurance sectors (financial firms) while 42 were listed within the non-financial sectors.

The decision to base this study on non-financial firms derives from the fact that unlike financial firms whose capital holding is strictly regulated by the CBK, capital holding regulations do not apply among non-financial firms in spite of all listed firms falling under the purview of CMA. This means that non-financial firms are technically at liberty to adopt any capital structure configuration favorable to them in financing their operations. This laissez-faire approach predisposes non-financial firms to possibilities of over-gearing and subsequent distress (Bitok, Masulis, Graham, & Harvey, 2011).

Further, unlike in developed economies where capital market systems are relatively elaborate, effective and quite efficient, the Kenyan capital market is still immature on most fronts (Ongore, 2011). The corporate bond market is particularly at the infancy stage and heralds relatively low participation level on the corporate bond segment (Mwangi, Anyango, & Amenya, 2012). The implication is that whenever non-financial firms are in need of additional debt capital, they naturally subscribe to commercial bank loans as their main source of debt finance. Bank loans in Kenya are however characterized with significantly high interest rate regime which further strains the financial performance of non-financial firms (Magara, 2012).

The devastating effects of financial distress among non-financial firms listed in Kenya has been highlighted over the past few decades. This is evidenced by the many firms that have been placed under receivership, undertaking financial restructuring or being delisted from NSE altogether. Such firms include: Uchumi Super Markets (2006), KPCU (2009), East African Packaging (2003), Dunlop Kenya, Regent Undervalued Assets Ltd (2001), Lonhro EA Ltd (2001), Theta Group (2001) among others (CMA statistical bulletins, 2003 – 2009). Although subsequent investigative reports conducted by government agencies have attributed this phenomenon to aggressive financing, analysts and members of the public alike have discredited these explanation on grounds of political expediency and lack of scholarly underpinning to support this assertion. Among finance scholars, the debate is further complicated by the fact that the empirical relationship between financial structure and financial distress indicators of corporations is not clear. It is against this background that an investigation of the effect of capital structure on financial distress of non-financial firms listed in Kenya is necessary.

1.2 Statement of the Problem

Financial distress has characterized the corporate sector for many years. In recent times, the world has witnessed numerous cases of failure among globally reputed firms. These corporations were regarded as icons of corporate financial stability and their collapse came with tremendous surprise to researchers and analysts alike. In the local front, a total of 21 listed corporations have either been placed under receivership, undertaken financial restructuring or delisted from NSE altogether since independence (CMA annual bulletin, 2014).

According to Altman and Hotchkiss (2010) this situation presents a grave concern to stakeholders who include managers, stockholders, lenders, employees and the government at large. To the managers, their job security and personal reputation are in jeopardy should the firm fail (Altman, 2000). According to Center (2007), the employees' basic livelihood is threatened when the firm struggles financially. To the

stockholders and lenders, their equity position and claims are not guaranteed when the firm is unable to meet financial obligations (Bender, 2013). The government also suffers declining tax revenues as well as adverse economic growth as a result of firm failure (Fabozzi & Drake, 2009).

According to Memba and Nyanumba (2013), the financing factor is the main cause of financial distress in the corporate sector. Further, Ohlson (1980), included capital structure among the nine determinants of corporate financial distress. In his MDA model, Altman (1968) also concluded that increasing the level of financial leverage enhances financial distress in the firms. Going by these empirical results, it is logically expected that capital structure would also have an adverse effect on the key indicators of financial distress that have been identified as corporate profitability, liquidity, firm value and investment growth (Outecheva, 2007). However, a review of literature reveal that different studies have provided conflicting results.

In studies carried out by Gupta *et al*. (2014), Mwangi, Muathe, and Kosimbei (2014),Perinpanathan (2014) and Umar, Tanveer, Aslam, and Sajid (2012), capital structure has been shown to be negatively and significantly related to individual indicators of financial distress. On the other hand, studies by Shehla Akhtar *et al*. (2012), Ogundipe *et al*. (2012) and Velnampy (2013) postulate a positive effect of capital structure on these indicators. However, studies undertaken by Ebaid (2009), Pratheepkanth (2011) and Kodongo, Mokoaleli-Mokoteli, and Maina (2014) concluded that capital structure has no effect on indicators of financial distress. Such contradictions in empirical observation is puzzling and provides a need to carry out an incisive investigation of capital structure affects corporate financial distress.

This study is therefore designed to address this scholarly gap. In contrast with the previous studies that limited their scope to specific indicators of financial distress, this study investigates the effect of capital structure on financial distress directly by using the Altman's Z-score of financial distress. This methodology derives from the

observation by Sundararajan *et al*. (2002) that financial distress provide information on the overall financial health of the firm and is a good indicator of firm quality. In addition, Moorhouse (2004) opined that contrary to corporate financial performance which considers a limited aspects of the firm's operation such as turnover, profitability and liquidity, financial distress evaluates the long run solvency of the firm.

1.3 Objectives of the Study

In carrying out the study, the objectives were categorized into general objective and the specific objectives.

1.3.1 General Objective

The study sought to establish the effect of capital structure on financial distress of non-financial firms listed in NSE.

1.3.2 Specific Objectives

In fulfilling this objective, the study was guided by the following specific objectives:

1. To establish the effect of financial leverage on financial distress of non-financial firms listed in NSE.

2. To examine the effect of debt maturity on financial distress of non-financial firms listed in NSE.

3. To determine the effect of equity structure on financial distress of non-financial firms listed in NSE.

4. To investigate the effect of asset structure on financial distress of non-financial firms listed in NSE.

5. To establish the moderating effect of firm size on the relationship between capital structure and financial distress of non-financial firms listed in NSE.

6. To determine the moderating effect of the listing sector on the relationship between capital structure and financial distress of non-financial firms listed in NSE.

1.4 Research Hypotheses

Based on the specific objectives, the study sought to test the following null hypotheses:

H_{01}: Financial leverage has no significant effect on financial distress of non-financial firms listed in NSE.

H_{02}: Debt maturity has no significant effect on financial distress of non-financial firms listed in NSE, in Kenya.

H_{03}: Equity structure has no significant effect on financial distress of non-financial firms listed in NSE, in Kenya.

H_{04}: Asset structure has no significant effect on financial distress of non-financial firms listed in NSE, in Kenya.

H_{05}: Firm size has no significant moderating effect on the relationship between capital structure and financial distress of non-financial firms listed in NSE, in Kenya.

H_{06}: The listing sector has no significant moderating effect on the relationship between capital structure and financial distress of non-financial firms listed in NSE, in Kenya.

1.5 Significance of the Study

The findings of the study provide a crucial insight concerning the role of capital structure in determining corporate financial distress. This knowledge will be of significant scholarly contribution as it sets pace for future research in this field. The findings of the study will also sensitize industry practitioners involved in making financing decisions by affording them a vital reference point on the need by corporations to determine and maintain optimal financing framework necessary to cushion firms against instances of financial distress. This will not only maximize the shareholders' wealth but will also boost investor confidence in the Kenyan capital market. The study findings are also of assistance to the capital market regulator (CMA) and other policy makers in formulating appropriate mechanisms necessary to continuously monitor and evaluate the financing aspect of corporations. This could be achieved by identifying specific industry-based debt thresholds that would ensure that firms are not unnecessarily exposed to risk of financial failure that results to erosion of investors' wealth.

1.6 Scope of the Study

The population of the study comprised the non-financial firms quoted in NSE. The decision to exclude firms listed in financial sector (banks and insurance companies) was based on the fact that financial firms are subject to tight regulatory controls with regard to capital holding and liquidity requirements; which may distort the conclusions of the study. Further, financial institutions have a tendency to apply off–balance sheet policy in disclosing their financial assets and liabilities; with the effect that not all the reported assets and liabilities actually belong to the firm (Altman, 2000).

Secondary data for the study was collected over the ten-year period from 2004 – 2013. This period was considered appropriate for the study as it was marked by a momentous shift in the country's political and economic regime. During this period, Kenya realized

significant economic growth and a sizeable increase in the number of listings at the NSE. This favorable situation was therefore expected to be reflected in the financial statements of the listed firms.

1.7 Limitations of the Study

The ten-year period covered by the study might be considered inadequate sufficiently provide in-depth and exhaustive understanding of the relationship between capital structure and financial distress of non-financial firms listed in Kenya. Further, in the process of collecting the secondary data, the researcher experienced instances whereby some firms had data for some years missing; resulting to situations of unbalanced panels. Furthermore, the study acknowledges that secondary data; which was gathered from audited financial statements and annual reports of listed non-financial firms could also have contained errors. Considering the cited limitations, the possibility of arriving at a biased conclusion on the study was real. However, steps to mitigate these limitations were taken as described in chapter three.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides a review of the main capital structure theories that informs the study and offers an understanding of how financing decisions affects the financial status firms. The chapter also provides a framework of financial distress prediction models and shows the relevance of financing factor in the failure process. Further, the chapter presents a conceptual relationship between financial structure and financial distress. The chapter also examines the empirical literature that that investigate the relationship between the study variables and concludes by critiquing the existing literature and identifying the gap (s) relevant for the study.

2.2 Theoretical Framework

Generally, capital structure refers to the mix of the different forms of financing adopted by the firm in financing its operations (Abor, 2005). Though corporate financial distress has been attributed to a myriad of factors, theorists have over the years considered financial structure as a key determinant of corporate financial stability. However, existing theories postulate conflicting relationship between capital structure and financial distress of the firm. While some models provide for positive interrelation, others suggest a negative relationship yet others find no relationship between the two variables. It is noteworthy that to date, there is no universally accepted theory of capital structure and there is no reason to expect one (Myers, 2001). This section describes the main theoretical orientations that provide insight on the relationship between capital structure and corporate financial distress.

2.2.1 Capital Structure Irrelevance Hypothesis

In their seminal work, Modigliani and Miller (1958) hypothesized that in conditions of perfect capital market; where taxes and transaction costs are non-existent, firms operate in homogenous risk environment, firms have 100% dividend pay-out and investors can borrow and lend in the same interest rates as the corporates, capital structure does not affect corporate financial distress. They argued that it is the combination of business risk (cost of capital) and earnings capacity (return on assets) but not how firms are financed that determine their financial distress. The implication is that companies that operate within the same business environment ordinarily possess similar risk structure and therefore have identical earning potential.

The theorists argued that such firms command equal market values notwithstanding how they are financed. The theorists further demonstrated that should such firms exhibit dissimilar market values, investors (who can borrow and led at the same interest rates as corporates) will continuously engage in arbitrage activities by selling their securities in the overvalued firm and buying securities in undervalued firm (investment switching). This will effectively increase demand for the securities in the undervalued firm and reduce demand of securities in the overvalued firm hence restoring the market valuation equilibrium.

This theory has however faced a lot of criticisms that mainly hinge on its perfect market assumptions. As can be seen, the authors have assumed that each company belongs to a specific "risk class," with same or similar income within states across the world. However, Stiglitz (1969) proved that this assumption is not realistic based on the fact that firms do not operate in homogenous business environment. In his review, the author also criticized the assumption that individuals can borrow at the same rate as corporations. He argued that the practice has shown that there are limitations toward the market rates for individuals when borrowing, compared to firm borrowing. In this respect, he held that the assumption of home-made leverage is not sustainable.

Regarding the methodology, Frank and Goyal (2003) stated that the theory is based on an abstract mathematical model which did not include the collection and analysis of data to arrive at this conclusion. This is in contrast with the recent approaches in the capital structure literature that mainly use quantitative approach or less commonly qualitative research methods to empirically test the modern theories (Graham & Harvey, 2001).

It is however notable that despite these imperfections and the fact that it fails to provide normative statements of practical relevance, Modigliani and Miller's contribution to the theory of capital structure was considered "path breaking"(Jensen & Meckling, 1976). According to Frank and Goyal (2003), although the Modigliani-Miller theorem does not provide a realistic description of how firms finance their operations, it provides a means of finding reasons why financing may matter. Further, Miller (1988) noted that today, the overall theoretical concept is widely accepted and has become a substantial part of economic theory and the very foundation for the modern finance theories.

This theory is relevant to the study because it provides for a non-biased perspective on the relationship between capital structure and financial distress variables employed by the study. By providing that financing decisions are irrelevant to the firm, the theory offers a neutral platform to undertake an incisive empirical analysis of this relationship within the targeted population.

2.2.2 Trade-off Theory of Capital Structure

The trade-off theory which clearly dominates the literature on capital structure claims that a firm's optimal financing mix is determined by balancing the losses and gains of debt financing. This theory that pioneered from the work of Modigliani and Miller (1963) followed the heavy criticism levelled against their irrelevance theory on account of their perfect market assumptions. By accepting that taxes exists in the real world arbitrage activities are not always sustainable, the authors showed that capital structure indeed affected the corporate market value.

By incorporating the effects of corporate taxes and relaxing the assumption on existence of arbitrage, they argued that interest on debt; being tax deductible provides extra cash flows to the levered firm in form of interest tax savings; that increases the market value of the firm. The theory therefore contended that in situations of permanent debt, constant cost of debt and static marginal tax rate, leveraged firms have more market value than unlevered firms. This is attributed to the present value of interest tax shield associated with debt financing.

Jensen and Meckling (1976) introduced the agency costs dimension to this hypothesis by suggesting that although debt brings forth specific advantages to the firm, it also increases the associated agency costs. The author opined that agency costs emanate from the principal-agent conflicts that exist between the debt-holders, shareholders and managers. They argued that on one hand, the managers may not be fully dedicated to maximizing shareholders wealth but rather may serve their own interests; resulting to wastage of the free cash flow through perquisites and sub-optimal investments. On the other hand, shareholders may engage in unprofitable investment on account of their limited liability status to the firm. To mitigate upon the potential losses that may result from these activities, debt-holders constantly engage the services of professional analysts and introduce debt covenants and restrictions. These mechanisms constitute additional agency costs to the firm that offsets the benefits occasioned by debt financing and reduces the firm value.

Myers (1977) introduced the costs of bankruptcy dimension by suggesting that although debt financing benefits the firm through tax-shield cash flows, the benefits from use of debt are not infinite. The author argued that other than the agency costs, debt introduces the risk of bankruptcy which is associated with the possibility of defaulting on debt repayment. He theorized that as a firm uses more debt, the financial risk increases and equity-holders become less motivated to provide more capital to the firm. Further, stockholders demand higher rate of return in terms of dividends pay-out ratios as a compensation for bearing more risk. Similar to equity-holders, debt holders become are

less enthusiastic to provide additional capital or demand high rates of interest on debt; which further increases the rate of cash outflow on the firm. By combining the theoretical effects of agency costs and bankruptcy risk, the theorist concluded that the tax-shield benefits afforded by debt to the firm are offset by the present values of bankruptcy and agency costs. Effectively, the theory postulates that as debt levels increases, the firm value also increases proportionately until a certain point where further increase in debt use increases both agency costs and bankruptcy costs and reduces the firm value.

In contrast to the irrelevance theory, the trade-off theory proposes moderate gearing levels. Furthermore, it plausibly substantiates the existence of an optimal or target capital structure that firms gradually try to achieve and maintain in order to increase shareholder wealth (Brounen, De Jong, & Koedijk, 2006). According to Hovakimian, Hovakimian, and Tehranian (2004), a value-maximizing firm facing a low probability of financial distress should use debt to full capacity.

Different variations of trade-off models have been provided in literature taking even more factors into account. For example, Auerbach (1985) created and tested an adjusted trade-off model and arrived at the conclusion that risky and fast-growing firms should borrow less. Furthermore, Fischer, Heinkel, and Zechner (1989) conducted a study with a variety of rich specifications arguing that capital structure also depends on restrictions in the debt-contracts, takeover possibilities and the reputation of management. However, none of these theoretical and empirical further developments have managed to fully replace the traditional version. So most researchers still refer to the original assumptions described above when testing the trade-off theory.

The implication of the trade-off theory is that Modigliani and Miller (1963) showed that the benefit of debt is primarily the tax-shield effect that arises due to the deductibility of interest payments. Myers (1977) combined this model with the bankruptcy cost framework of Kraus and Litzenberger (1973) and Scott (1976) to come up with the

classic static trade-off theory where the costs of debt are mainly associated with direct and indirect costs of bankruptcy. These include legal and administrative costs and more subtle costs resulting from the loss of reputation among customers and the loss of trust among staff and suppliers due to uncertainties. However, the consensus view is that bankruptcy costs alone are too small to offset the value of tax shields and additional factors must be included in a more general cost-benefit analysis of debt (Ju, Parrino, Poteshman, & Weisbach, 2005). For that reason, the agency costs framework of Jensen and Meckling (1976) that is also considered in the trade-off model.

The relevance of this theory to the study is that it provides for explicit understanding of how debt financing increases the firm value through the tax-deductibility feature associated with borrowing. In addition, the theory introduces the of agency costs as well as costs of financial distress the capital structure concept and shows how capital structure may negatively influence the firm by increasing the agency costs associated with borrowing.

2.2.3 Pecking Order Theory

Myers and Majluf (1984) introduced the information asymmetry dimension to the pecking order hypothesis proposed earlier by Donaldson (1961). They argued that existence of information asymmetries between the firm and providers of capital causes the relative costs of financing to vary between the different sources. For instance, an internal source of finance where the funds provider is the firm will have more information about the firm than external financiers such as debt holders and equity holders thus, these outsiders will expect a higher rate of return on their investments. This means that it costs the firm more to obtain external capital than using internal funds.

Another dimension of presenting the information asymmetry effect on financing is that in normal circumstances, the insiders who constitutes the managers and directors have more knowledge about the firm than outsiders with regard to the firm's earning

potential. This inadequate information among the outsiders makes them to undervalue the firm. Based on the assumption that managers act in favor of the interest of existing shareholders, they refuse to issue undervalued shares unless the value transfer from existing to new shareholders is more than offset by the net present value of the growth opportunity. This leads to the conclusion that new shares will only be issued at a higher price than that imposed by the real market value of the firm.

Therefore, investors interpret the issuance of equity by a firm as signal of overpricing. If external financing is unavoidable, the firm will opt for secured debt as opposed to risky debt and firms will only issue common stocks as a last resort. Myers and Majluf (1984), maintain that firms would prefer internal sources to costly external finance. Thus, according to the pecking order hypothesis, firms that are profitable and therefore generate high earnings are expected to use less debt capital than those that do not generate high earnings. If internal funds are not sufficient, the managers will issue debt first so as to safeguard the existing shareholders against the diluting effect. They will only issue external equity when they are convinced that the market has fully appreciated the firm's potential in which case the external equity would be overvalued.

In contrast with the trade-off theory, this theory considers interest tax shields and the potential threat of bankruptcy to be only of secondary importance. The theory contend that gearing ratios are adjusted when there is a need for external funds which results from the imbalance between internal cash flow, net of dividends, and real investment opportunities (Shyam-Sunder & Myers, 1999). This means that only firms whose investment needs exceeded internally generated funds would borrow more debt. According to Myers (2001), under the pecking order proposition, each firm's debt ratio is therefore a reflection of its cumulative requirement for external financing and profitable companies with limited growth opportunities would always use their cash surplus to reduce debt rather than repurchasing shares.

The theoretical implication of pecking order theory is that there exists a clear financing hierarchy and there is no well-defined target debt ratio as suggested under the trade-off theory. This theory provides for preference to use of internal funds in place of external funds that encapsulate debt and equity in an effort to preserve value and firm stability. The implication is that increased use of external capital such as debt and equity influences the firm value negatively and increases the chances of financial distress.

2.3 Conceptual Framework

A conceptual framework is a graphical or diagrammatical representation of the relationships between the variables being investigated by the study (Myers, 2013). Based on the theoretical literature reviewed by the study a conceptualization of the interrelation between individual constructs of capital structure and financial distress of non-financial firms listed in NSE is undertaken. In addition, the study model captures the moderating effect of firm size and listing sector.

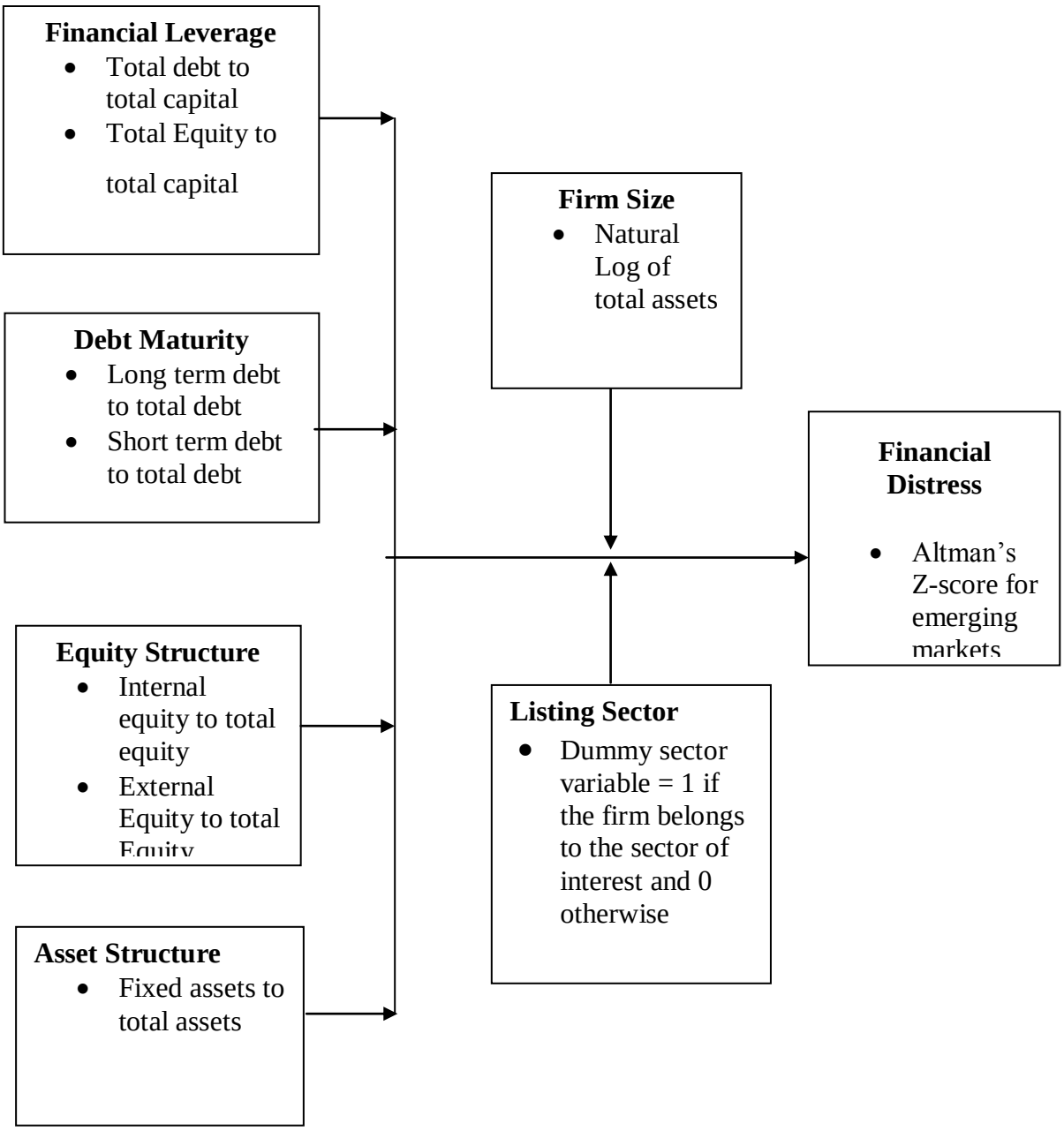

Figure 2.1: Conceptual Framework

Figure 2.1 show the conceptual framework of the study and depicts the interrelationship between the study variables. The dependent variable in the study is the financial distress. The independent variable is the capital structure. Capital structure is represented by four constructs which include: Tangibility, financial leverage, debt maturity and equity structure. The moderating variables for the study are firm size and the listing sector.

In the study, the dependent variable (financial distress) is operationalized through the Altman's Z-score index of financial distress as modified for the emerging markets. On the other hand, the asset structure is measured by the level of tangibility which is the ratio of fixed assets to total assets. Financial leverage is measured by the proportion of debt and equity in the capital structure. Debt maturity is measured using the duration taken between procurement and repayment of debt and encapsulates long term debt and short term debt. Equity structure is determined by the proportion of internal and external equity in the capital structure. The firm size is measured as the natural logarithm of total asset value while listing sector is operationalized using the dummy variable that takes a value of 1 if the firm belongs to the sector of interest or 0 otherwise. The sectors of interest that encompass the seven sectors within which non-financial firms are listed include: Agriculture, Automobiles and accessories, Commercial and services, Construction, Energy and petroleum, Manufacturing as well as Investments.

2.4 Review of Literature on Variables

2.4.1 Financial Leverage and Financial Distress

In a study aimed at investigating the impact of debt financing on financial distress of firms listed in Palestine stocks exchange, Abu-Rub (2012) used a sample of 28 firms over the five years period (2006 – 2010). In the study, total debt to total assets and total debt to total equity were used as proxies of financial leverage while return on equity represented corporate financial distress. The results showed that debt financing had a positive and significant effect on ROE. The author argued that companies that employed

debt to finance their operations benefited from interest-tax savings that helped in building up more reserves for shareholders. This finding agreed with those by Nerlove (1968) and Baker (1973) who found a positive and significant relationship between use of debt and return on assets of industries in Bangladesh and Turkey respectively. The effect of the finding was that increasing use of debt in the companies resulted in significant increase in productivity of the firms' assets.

In another study, Pratheepkanth (2011) studied the 210 Sri-Lankan firms listed in the Colombo stock exchange with a view of establishing how leverage affected financial distress of the firms. The study spanned over the five years period 2005 – 2009. In undertaking the study, leverage was measured by debt-equity ratio and total debt-total capital ratio while gross profit and net profit margins were adopted as measures of financial distress. The study found a negative but weak (insignificant) relationship between the key study parameters. The implication of the finding was that increasing debt use reduced the firms' level of productivity but to a lesser extent. The research result was in consonance with that by Perinpanathan (2014) whose study of John Keells Holdings plc. (Sri Lanka's largest listed firm) during the seven year period 2006-2012 concluded that debt financing had a negative but insignificant impact on the firm's profitability as represented by EBIT to Total assets ratio. These findings were however at variance with those by Yat Hung, Ping Chuen Albert, and Chi Man Eddie (2002) who observed that financial leverage had a positive effect on financial distress of firms in the property and construction sectors in Hong Kong as measured by ROE.

In another study, Gupta *et al*. (2014) investigated the effect of financial leverage on financial distress of the 100 firms listed in the Indian National Stocks Exchange over the 5 years period (2006 – 2010). Both the market and book value of debt and equity were adopted as proxies of leverage, while financial distress was measured by ROA. The author observed that financial distress was negatively and significantly correlated with debt financing but positively and significantly related with equity capital. The implication of the result was that the highly geared companies exhibited declining

financial distress while firms with high levels of equity were more financially sound. This finding mirrored the result by Krishnan and Moyer (1997) whose study showed a negative and significant impact of total debt on return equity (ROE) among the 81 Asian corporations studied. However, the findings differed with that by Shehla Akhtar *et al*. (2012) whose similar study on firms in the energy and fuel sectors listed in Karachi Stocks Exchange, Pakistan showed that there was a positive relationship between financial leverage and financial performance, corporate growth and firm size.

Ebaid (2009) carried out an empirical study to investigate the impact of borrowed capital on financial distress of firms listed in Egypt. Financial distress was operationalized using profitability measures that included ROE, ROA, and gross profit margin while borrowing level was represented by total debt to total assets ratio. The study indicated that debt use had insignificant to no impact on the financial distress of the firms. This result was however inconsistent with similar empirical studies carried out by Hadlock and James (2002) and Ghosh, Nag, and Sirmans (2000) both of which postulated a positive relationship between financial leverage and financial distress of the firm.

Umar *et al*. (2012) on the other hand undertook a similar study on 100 firms consecutively listed in the Karachi Securities exchange during the period 2006 – 2009. The study used total debt to total equity as well as total liabilities to total assets ratios as proxies of leverage while EBIT, Net profit margin and EPS represented financial distress. The study found that all the proxies of leverage had a significant and negative impact on profitability measure of financial distress. This findings mirror that by Xin (2014) who found a significant negative relationship between financial leverage (debt-equity ratio) and growth in earnings per share (EPS) among the Vietnamese firms. This conclusion however differs from the finding by Abor (2005) whose study showed a significant positive relationship between total debt to total assets ratio and return on equity (ROE) among the 22 firms listed in the Ghana stocks exchange during 1998 to 2002.

In a study of firms in the U.S banking industry, Berger and Di Patti (2006) examined the dualistic relationship between leverage and firm distress. They used a parametric measure of profit efficiency as an indicator of the agency costs. The study found that higher debt levels were associated with better firm distress. Margaritis and Psillaki (2007) considered a similar relationship for a sample of New Zealand small and medium sized enterprises (SMEs) using distance functions as a measure of firm performance. The study also found that highly leveraged firms have higher financial performance. However, Chhibber and Majumdar (1999) showed that in India leverage was negatively related to firm distress measured through profitability. This was however at variance with Pushner (1995) who found negative effect of leverage on financial distress of Japanese firms as measured by the total factor productivity (TFP).

Closer home, Mwangi *et al*. (2014) undertook a study to identify the relationship between financial leverage and profitability of the 42 non-financial firms quoted at the NSE over the period 2006 – 2012. Financial leverage was measured by current assets to total assets ratio and total debt to total capital ratio while profitability was observed through both ROA and ROE. The study found a statistically significant negative association between the two study variables with the implication that increased debt use lowered the firm's profitability as measured by ROA and ROE. This finding is in agreement with those by Zeitun and Tian (2014) and Maina and Ishmail (2014) who showed a negative and significant relationship between debt and profitability among the Jordanian and Kenyan listed firms. The findings however differ with that by Kiogora (2000) whose study showed a positive relationship between financial leverage and financial distress as represented by ROE among the Kenyan listed firms. Hoque, Hossain, and Hossain (2014) conducted a study of 20 manufacturing firms listed in Dhaka Stocks Exchange over the period 2008-2012. The study whose primary aim was to determine the effect of capital structure on firm value adopted the sum of debt and equity values as the proxy for the firm value. The debt-equity ratio, debt to asset, fixed assets to total assets (tangibility), earnings before interest and taxes to interest charges**,**

and the financial leverage multiplier represented the independent variable. The study found a negative association between the two debt ratios and firm value measures. These findings agrees with that by De Jong (2002) who found a significant negative relationship between leverage and Tobin's Q measure of firm value for the Dutch listed non-financial firms over the period 1992-1997. This finding is nonetheless at variance with that by Hoque *et al*. (2014) whose study of 48 firms quoted at the Bucharest Stocks Exchange, Romania for the period 2003-2012 showed a positive and significant influence of leverage on the firm value as measured by Tobin's Q.

Rayan (2010) conducted a 10-year longitudinal study of 113 firms listed in the Johannesburg Stocks Exchange, South Africa with a view to determine the relationship between financial leverage and firm value. The debt-equity ratio was used as a construct for financial leverage while ROE, ROA, EPS, P/E ratio and EVA were used to proxy firm value. The study found a negative correlation between use of debt in relation to equity and all measures of firm value; with the result that increased leverage decreased the firm value among the Southern African firms. He attributed this negative relationship to excessive use of debt financing by firms in a bid to benefit from tax-shields. The study results concurred with the findings by Rajan and Zingales (1995) but conflicted with pioneering research studies by Modigliani and Miller (1963), Fama and French (2002) and Lins (2003) all of which postulated that increase in debt use boosted the performance of the firm with regard to value.

Kodongo *et al.* (2014) undertook a study that sought to find out the effect of financial leverage on firm value of firms listed in Nairobi securities exchange, Kenya. The study that covered the period 2002 – 2011 adopted debt equity ratio, total debt to total assets ratio and long-term debt to equity ratio as proxies of leverage while Tobin's Q ratio was used to measure the firm value. Upon controlling for the GDP growth, firm size, tangibility and growth in sales, the study found that financial leverage had no effect on the Tobin's Q. This finding was in agreement with the pioneering capital structure irrelevance hypothesis postulated by Modigliani and Miller (1958) but differed with that

by (Zeitun and Tian (2014)) whose similar study of 167 Jordanian companies during the period 1989 – 2003 showed a significant negative relationship between debt ratios (leverage) and Tobin's Q.

Studies seeking to explain the effect of leverage on firms' liquidity have provided mixed results. Kim, Mauer, and Sherman (1998) undertook a study aimed at establishing the effect of financial leverage on cash holding levels among the Korean listed firms. Leverage was operationalized by debt-total assets as well as equity-total assets ratios while liquidity was measured by networking capital ratio. The study found that firms with high debt ratios depicted low cash holding levels in contrast to the firms that were mainly funded through equity. This is in line with the pecking order hypothesis of capital structure that argued that the basic motivation for holding liquid assets is creation of financial slack which will allow the firm insiders to pursue future attractive investment opportunities when they present themselves so as to maintain control of the entity (Myers & Majluf, 1984).

Dennis *et al* (2001) conducted a study that sought to determine how leverage influenced liquidity levels of firms listed in Toronto stocks exchange, Canada. He sought to test the validity of the agency hypothesis of capital structure as propounded by Jensen and Meckling (1976) on the Canadian capital markets. Leverage was represented by total debt to total capital ratio, while the current ratio was used as proxy for liquidity. The study found a significant and negative relationship between the study variables. He attributed the low liquidity levels to increased cash outflows in form of debt repayments. The findings were in support of the agency conflict hypothesis that provide for increased financial risk as a result of debt financing. This results to increase in the financial burden (through loan interest payments) to the firm and hence low levels of free cash flow. This findings concurred with that by Frieder and Subrahmanyam (2005) who found a negative relationship between debt financing and working capital among the Ghanaian listed firms. The researcher attributed low liquidity increased dividend payouts as

shareholders demanded more dividends in a bid to take away free cash flows from managers.

2.4.2 Debt Maturity and Financial Distress

In the words of Baum, Schafer, and Talavera (2006), debt maturity encapsulates the duration between procurement and repayment of borrowed capital. Depending on the period that debt remains outstanding, borrowed capital can be categorized as either short term and long term (Pandey, 2009). Antoniou, Guney, and Paudyal (2006) stated that while short term debt becomes due within one year of the balance sheet date, long term debt has a maturity period exceeding 12 months from the reporting date. Short term debt is also synonymous to current liabilities and include: bank overdrafts, current portion of term loans, accounts payable and accrued expenses as well as current taxes due (Baum *et al*., 2006). On the other hand, long term debt; which essentially constitute the non-current liabilities include: non-current portion of term loans, bonds payable, deferred taxation as well as retirement benefits obligations (Vermoesen, Deloof, & Laveren, 2013).

Over the years, empirical studies have demonstrated that the combination of short term and long term debt influences the corporate financial distress differently. In a seminal paper, Myers (1977) argued that firms that employed shorter-maturity debt are likely to have more growth options in their investment opportunities. They opined that debt that matured before execution of investment options cannot lead to suboptimal investment decisions. By exploring the contract-cost hypothesis, they reasoned that the conflict between stockholders and bondholders might lead to an underinvestment problem if long-term debt is issued. Given that underinvestment deteriorates profits in the long run, such behavior implies a negative relationship between long term debt and firm performance. The finding is in concurrence with that by Aivazian, Ge, and Qiu (2005) whose study showed a significant negative relationship between debt maturity (percentage of long term debt to total debt) and investments (the ration of capital

expenditure minus depreciation to lagged fixed assets value) of non-financial firms in the US over the period 1982 – 2002. This position was nevertheless at variance with the empirical finding by Brick and Ravid (1985) who showed a positive relationship between long term borrowing and profitability. He argued that long term debt enabled the firms to avoid taxes and hence boost their profitability.

Schiantarelli and Sembenelli (1997) investigated the relationship between debt maturity structure and performance of firms in UK and Italian firms as measured by the ratio of cash flow to capital. By use of panel data, they found that firms that used more long term debt as compared to short term debt tended to perform better than their counterparts with higher proportions of short term debt. The finding was consistent with the dominant role played by firms' fear of liquidation as well as loss of control associated with short term debt financing. It also reflects the willingness of the lenders to provide long term finance only to highly liquid and stable firms. However, this finding is diametrically opposite with that by Baum *et al*. (2006) whose study that sought to compare the effect of short term debt (current liabilities to total liabilities) on profitability (ROA) of German and US firms found that use of short-term borrowing leads to increased profitability among the Germany firms whereas it had no effect on US firms.

Velnampy (2013) carried out a study aimed at determining the impact of debt structure on the value of ten firms listed in Colombo Stocks Exchange, Sri Lanka, over the period 2006 – 2010. The long-term debt-assets ratio as well as short term debt to equity were used as proxies of debt structure while firm value was represented by EPS and P/E ratios. The study used correlation and regression analysis to test for the significance of debt structure on the firm value. The study found that while an inverse relationship exists between the short term debt-equity ratio and the dependent variables, the long term debt/asset ratio exhibited a positive influence on both the EPS and P/E measures. The implication of the finding was that the Sri Lankan firms preferred long term borrowing to initial maturity debt. The result resonated with that by Ogbulu and Emeni

(2012) whose study of 225 firms listed in the Nigerian Stocks exchange as at 31st December 2007 revealed a positive and statistically significant association between long-term debt and firm value.

Cuong (2014) undertook a study aimed at assessing how debt maturity terms influenced profitability of the Seafoods manufacturing enterprises listed in the Vietnamese Stocks Exchange. The study used 552 observations from the sampled 92 firms during the period 2005-2010. In the study, non-current liabilities to total assets ratio was used to proxy long term borrowing and ROE represented the profitability measure. Upon controlling for firm size (Ln total assets) and firm growth (total revenue$_t$ -total revenue $_{t-1}$/ total revenue $_{t-1}$), they used the panel threshold regression model to test for relationship between the variables. The study revealed that a multiple-threshold effect existed between long term debt ratio and profitability. Specifically, the study found that firms with more than 59.27% debt exhibited a significant positive relationship between the two variables while firms with less than 59.27% of long term debt demonstrated a significant inverse relationship. The implication of the study was that debt maturity had a nonlinear relationship with profitability represented by a convex Parabola. This finding mirrors that by Aggarwal and Kyaw (2006) who posited that, debt maturity can have both positive and negative effects on performance of the firm so that the optimal debt structure is determined by balancing the agency costs and other costs of debts as a means of alleviating the under and over-investment problems.

Ogundipe *et al*. (2012) undertook a study to assess the effect of debt structure on liquidity levels of the Nigerian listed firms over the period 2002-2010. Both short-term and long-term debt ratios were used to proxy debt structure while liquidity was measured by the ration of cash flow from operations to total assets and the working capital ratio. The results showed a significant positive relationship between long term debt and liquidity. On the other hand, a significant inverse relationship between short term debt and liquidity ratios was observed. This finding was in consonance with the signaling effect theory of debt structure postulated by Ross (1977) which opined that

higher levels of long term debt signify higher quality to the investors who responds by investing in the firm; effectively raising the cash flow levels.

2.4.3 Equity Structure and Financial Distress

In corporate finance theory, firms have two principal sources of equity financing: internal and external (Brealey & Myers, 1999). Internal sources constitutes the internally generate funds not distributed to owners in form of dividends such as retained earnings and reserves. On the other hand, external equity comprises all funds acquired externally with exception of debt (Smith Jr, 1988). Empirical studies on the manner in which the different sources of equity financing influences the firm's distress are underpinned on the pecking order theory of capital structure. Particularly, finance literature documents that firm's exhibit a clear preference for internally generated funds over external sources of capital (Brealey & Myers, 1999; James & Wier, 1988; Pinegar & Wilbricht, 1989).

Various explanations have been postulated for this preference for internal funding. First, using internal funds provides managers with greater flexibility. For example, managers can quickly finance and thus implement investment plans, and they retain the option of raising funds externally in the future. Second, firms avoid costs such as legal, accounting, and underwriting fees when using internal funds, but they must incur such flotation costs when raising funds externally (Pandey, 2009). Third, because there is asymmetric information between managers and investors about a firm's investment opportunities, the market may undervalue a firm's new shares relative to the value that would be assessed if managers' information about their firm's investment plans were publicly available (Myers and Majluf 1984). Consistent with this argument, the stock market generally responds negatively to announcements of the issuance of common shares and influences the performance of the firm.

Forsaith and McMahon (2002) Conducted a study of 871 Australian manufacturing SMEs aimed at identifying the manner in which different sources of equity finance influenced their growth levels over the five year period 1994 - 1998. Internal equity was proxied by the ratio of retained earnings to total assets while issued share capital to total capital represented external equity. Growth level was measured by year-on year growth in turn-over. After controlling for firm size and GDP growth, the regression results showed significant positive coefficient on internal equity variable while the coefficient for external equity was significant and negative at 10% significance level. The findings showed that while internal equity increased the growth rate, external equity was not favorable to the firms. The results were consistent with those by Cosh and Hughes (1994) whose study of 217 UK firms over the period 1982 – 1988 depicted use of internal equity as profitable to the firms. Further, the findings supports the pecking order hypothesis of capital structure.

In a study of 195 US firms, Park and Pincus (2001) used the ARIMA models to determine the manner in which equity structure affected the firms' earnings response coefficient (ERC). The cumulative abnormal returns was used as the dependent variable while the interaction between internal equity-external equity ratio and unexpected earnings (UX) as well as leverage were used as explanatory variables. Upon controlling for firm size and growth opportunities variables, the study results indicated that internal equity-external equity ratio significantly and positively influenced earnings response coefficient. The implication was that firms with higher proportions of internal equity capital registered higher returns per share as opposed to those with minimal internal capital. The findings however contrasted those by Margaritis and Psillaki (2007) whose study of 113 Greek firms concluded that the sources of equity financing had no significant effect on the firm value as measured by Tobin's Q.

Elsas, Flannery, and Garfinkel (2004) Conducted a study of 977 German-based firms that undertook major investments during the period 1989 – 1999. The study's objective was to identify how internal and external modes of financing affected the firm's

performance with regard to long-run abnormal stock returns. This was done by identifying the predominant source of financing each investment and then separating the valuation effects of that investment from the effects related to financing decisions. Debt (long term and short term) and externally issued equity (both common and preferred stock) constituted external sources of financing while cash flow from operations constituted internal equity. The dependent variable for the study (long run stock performance) was determined by Fama and French (1993) three factor model. The study found that the returns from internally financed investments outperformed the returns of investments that were predominantly funded from external sources. The findings were however at variance with those by Richardson and Sloan (2003) whose study led him to observe that cash from newly issued securities simply replaces another source of funding just as when a maturing bond is replaced by another. He further concluded that newly issued securities enabled the firm to grow faster than internal funds alone would permit.

Brown (2005) Used the Cox proportional hazard model to examine the differences in survival durations between venture- and non-venture-backed firms in the US high-tech sector over the one decade (1980 – 1989) following their IPO. The study also appraised the performance of the firms with regard to assets and sales growth, Tobin's Q and operating performance during the period. After controlling for size and age of the firms, the results showed that venture-backed firms exhibited longer survival durations than non-venture-backed firms. They also reported higher growth rates as well as superior operating performances. The study therefore concluded that overreliance on internal sources of funds denied firms in the high-tech sector opportunities to experience growth and resulted to higher levels of cumulative exit rates. The finding concurs with that by Sciascia and Mazzola (2008) whose study of 317 Italian firms revealed that firms with high proportions of external equity performed better in terms of profitability and hence stock returns as compared to internally funded firms. He attributed this trend to improvement in governance and discipline among managers.

2.4.4 Asset Structure and Financial Distress

According to Pouraghajan, Malekian, Emamgholipour, Lotfollahpour, and Bagheri (2012), asset structure represents the manner in which the firm chooses to retain its assets investments. Normally, assets can either be tangible or intangible. Tangible assets are the physical assets such as the property, plant and equipment. Intangible assets on the other hand are non-physical assets and include assets in the class of intellectual property, patents and copyrights (Babalola, 2013). In the study, asset tangibility; which represents the proportion of fixed assets in the asset investments was used to measure the asset structure. According to Maina and Ishmail (2014), the level of asset tangibility provides information on the capital structure of the firm since it dictates the capacity to sustain debt by the firm. The author argued that firms with low tangibility have low collateral capacity and therefore are expected to maintain low borrowing levels.

Empirical evidence has shown that assets tangibility influences financial distress of firms in different manner. Akintoye (2009) argued that firms that retain large proportion of their asset investments in form of tangible assets are less susceptible to experience financial distress. The author reasoned that a highly tangible corporation has a greater ability to produce large volume of products and hence generate more sales revenue. Accordingly, such firms are able to remain profitable in the long run.

According to Ebel Ezeoha (2008), by following the trade-off theory, the tangibility of asset has a positive sign towards debt ratios in the cross-sectional test. The author argued that firms with high tangibility usually borrow more due to increased debt capacity. As a result, these firms are more likely to pay taxes less in form of taxes. The implication is that firms with more tangible assets are less likely to be damaged in financial distress. Similar reasoning has been advanced through empirical studies by Frank and Goyal (2003) Titman and Wessels (1988) who opined that more capital-

intensive firms are expected to be more efficient in production and hence perform better as they use superior technology.

However, in their study, Maina and Ishmail (2014) disapproved these findings by showing that the asset tangibility is negatively related to financial distress of the firm. By using ROA as a measure of corporate profitability, the authors argued that highly tangible firms naturally have more collateral at their disposal. The high collateral makes the firms attractive to the financial institutions and subsequently increases their appetite for debt. The authors stated that this tendency to over-borrow exposes the firm to higher risks of financial distress and subsequent failure.

In another study, Campello and Giambona (2010) showed that firms with higher levels of tangibility are more distressed than their counterparts that keep their assets in liquid form. The authors argued that contrary to the common belief that tangibility implies more ability to service debt, creditors normally perceive tangible assets to be more illiquid and therefore hard to repossess in case of default. In such circumstances, it would be difficult for highly tangible corporations to access debt financing from lenders; which consequently stifles their productivity.

2.4.5 Firm Size and Financial Distress

In finance literature, firm size has been described as the amount and variety of production capacity and ability a firm possesses or the amount and variety of services a firm can provide concurrently to the customers (Mule, Mukras, & Nzioka, 2015). It refers to how big or small the firm is and constitutes a primary factor in determining financial robustness of a firm (Surajit & Saxena, 2009). In empirical research, different measures have been adopted to operationalize firm size. Measures such as natural logarithm of total assets, natural logarithm of total sales, as well as natural logarithm of total employees have been extensively employed with success to depict the size of the firm in empirical research (Kodongo *et al.*, 2014; Mwangi *et al.*, 2014).

Ebel Ezeoha (2008) Stated that the size of a firm plays a crucial role in determining the kind of relationship the firm enjoys within and outside its operating environment. He opined that usually, the larger a firm is, the greater the influence it has on its stakeholders. Again, the growing influences of conglomerates and multinational corporations in today's global economy and in local economies where they operate are indicative of what role size plays within the corporate environment. Pointing out the importance of size in corporate discourse, Rajan, Zingales, and Kumar (2001) observed that much of the economic growth takes place through expansion in the size of existing corporate organizations. They cited Rajan and Zingales (1995) whose study of 43 countries showed that two-thirds of the growth in industries over the 1980s, came from the growth in the size of existing corporate establishments, while only one-third trickled in from the creation of new ones. From the foregoing, it is evident that the importance of size of the firm in determining corporate financial distress cannot be underestimated.

The underlying theoretical basis for arguing that firm size is related to corporate financial distress can be found in the traditional neoclassical view of the firm and the concept of economies of scale. Economies of scale may occur for reasons such as financial (a large firm can get better interest rate and also better discount rate due to a large quantity that it buys); organizational reason (specialization and division of labor) as well as technical reasons (division of high fixed costs across large number of units) (Papadogonas, 2006). In line with this concept, a positive relationship between firm size and profitability is postulated. On the contrary, a conceptual framework that advocates a negative relationship between firm size and performance is noted in the alternative theories of the firm, which suggest that large firms come under the control of managers pursuing self-interested goals and therefore profit maximization as the firm's objective function may be replaced by managerial utility maximization function (Marsh, 1982). Also, finance scholars such as Gonenc (2005) and Dittmar (2004) have argued that due to increased debt capacity, large firms have may have a tendency to issue more debt and hence suffer from effects of overleveraging leading to decline in profitability. This

position was also supported by Khan (2012) and Maina and Ishmail (2014) whose studies found negative relationship between firm size and firm value (Tobin's Q). They attributed the negative relationship to the tendency of large firms to be inefficient resulting to low performance. Yet, some authors have argued that the size of the firm does not influence its financial distress. In their opinion, it is factors such as earning capacity, risk environment (cost of capital) as well as managerial competence that are key in determining corporate performance.

In line with these schools of thought, empirical studies have yielded mixed results on the effect of firm size on corporate financial performance. Some of the studies have attributed this relationship to differences in capital structure decisions among firms of varying sizes. Considering that the specific objective of the study was to investigate the manner in which the relationship between capital structure and financial distress of non-financial firms listed in Kenya is altered with respect to firms of different sizes, a review of these empirical findings is deemed necessary under this section.

Amato and Burson (2007) Studied the relationship between firm size and profitability of the firms operating in the UK financial services sector. In their study that tested for both linear and cubic form of the relationship, they found that a negative relationship existed between firm size and profitability under both linear and cubic models. They argued that as firms expanded, they had the tendency to increase the debt component in the capital structure as opposed to small-sized firms. This inevitably resulted to reduction in efficiency and profitability. In a related study, Serrasqueiro and Nunes (2008) studied the effects of firm size on profitability among the SME firms operating in manufacturing sector in Portugal using the data for years 2002 to 2007. The results of the study showed that a negative and statistically significant relationships existed between the natural logarithms of total assets, total sales and number of employees of the firms (size) and their profitability measures. They attributed the negative relationship to a system of capital structuring where large-sized firms used more debt capital to finance their assets as a result of increased collateralization; which resulted to decline in performance levels.

Lee (2009) Examined the role that firm size played in determining the profitability of the US publicly –held firms. By using the fixed effect dynamic panel data model and a sample of more than 7000 entities, the study showed that absolute firm size (total assets) had a significant nonlinear relationship with profitability measures; meaning that gains in profitability reduced for larger firms. The study attributed the negative coefficient between the variables to the tendency by larger firms to finance their assets by large amount of debt capital due to increased borrowing capacity. Similar findings were echoed by the study carried out by Artikis, Eriotis, Vasiliou, and Ventoura-Neokosmidi (2007) on 129 Greek companies listed on the Athens Stock Exchange during 1997-2001. The study showed a negative and statistically significant relationship between firm size and value of the firm as measured by Tobin's Q. The adverse empirical relationship was attributed to the observation that big firms gravitated towards use of more indebtedness than smaller firms and hence were vulnerable to risks of financial distress.

Central to the above general positions is the fact that as a firm grows in size, its ability to borrow increases, and so, its debt-equity ratio increases concurrently. This exposes the larger firms to risk of bankruptcy leading to increase in overall cost of capital. Within the circuit of small firms, need for funds may be limited by the fact that their scales of operations are also limited. Consequently, not only would banks and investors alike be afraid of committing funds in the projects of small businesses, the small firms themselves may be indisposed to exposing themselves to risks associated with distress and bankruptcy, as well as loss of ownership.

Ozgulbas, Koyuncugil, and Yilmaz (2006) On the other hand studied the effect of firm size on performance over the firms operating in Istanbul Stock Exchange between the years of 2000 to 2005. The study revealed that big scale firms had a higher performance as compared to small scale firms. The researcher attributed this dichotomy in performance of the firms to the fact that banks were more willing to lend their funds to larger firms partly because they are more diversified and partly because larger firms

usually request larger amounts of debt capital than smaller firms. Consequently, larger firms were able to reduce transaction costs associated with debt issuance and could arrange a lower interest rate. The findings were in consonance with those by Mule *et al*. (2015) whose study of listed firms in Kenya during the period 2010 – 2014 showed a positive and significant relationship between firm size (logarithm of total sales) and profitability (ROE). The authors observed that higher profitability for larger firms as compared to smaller firms could be attributed to differential in debt structure of the two categories of the firms and the ability of larger firms to harness the advantages associated with financial leverage.

In a study that sampled 15 companies operating in South India, Vijayakumar and Tamizhselvan (2010) used a simple semi-logarithmic specification of the model to determine the relationship between firm size and profitability. The authors used natural logarithm of sales and total assets as measures of size and profit margin as well as profit to total assets as measures of profitability. The study found a positive and significant relationship between the two variables. In conclusion, the authors attributed the positive relationship to the fact that large firms had the ability to arrange for debt at discounted interest rates as well as refinance long term debt hence enjoy sustained liquidity to finance the capital projects. The findings mirrored those by Velnampy and Nimalathasan (2010) who conducted a study on the relationship between firm size and probability of financial distress of all the commercial banks in Sri Lanka over the period of 10 years from 1997 to 2006. The authors observed a negative relationship between bank size and the probability of bank failure; implying that big banks showed no signs of bankruptcy as was the case on small-sized banks. This result was attributed to the fact that larger banks were more diversified and thus bore lower probability of default.

In a similar fashion, Jónsson (2008) studied the relationship between financial distress and size of the firms operating in Iceland. The logarithm of total sales was used to measure firm size while return on equity represented financial distress level. After controlling for firm age, the results of the analysis showed that bigger firms have higher

profitability as compared to smaller firms. The author observed that though large firms had higher levels of debt financing as compared to smaller firms, they were able to negotiate lower interest rates on debts; which resulted to improved financial distress. These results were in agreement with those by Babalola (2013) whose study of 80 Nigerian manufacturing firms listed in the Nigerian stocks exchange showed a positive and significant relationship between firm size and profitability (ROA).

Several studies have however shown that firm size is not a significant determinant of corporate performance; with the implication that it does not alter the manner in which capital structure influences financial distress variable. Such studies include: (Mwangi *et al*., 2014)

2.4.6 Listing Sector and Financial Distress

Alkhatib (2012) noted that analyzing corporate financial distress would not be complete without considering the environment within the firm operates. In qualifying this statement, the authors stated that firms normally face varying economic, cultural and sectorial dynamics all of which are crucial in determining their long run financial stability. The importance of sector variable in assessing firm performance was emphasized by Sabido and Mulato (2006) that analyzed growth in profit margins of listed firms in Eastern Africa showed that movements in profit margins of firms operating within similar sectors were almost level. Further, Schoubben and Van Hulle (2004) observed that sector-specific factors play a crucial role in determining their leverage behavior.

Although finance and economics scholars have agreed that industry-specific factors are critical in determining the performance of firms, studies have provided conflicting results on how these dynamics alter the effect of capital structure on corporate financial distress. In their study of 101 Australian firms selected from manufacturing and investments sectors, Shumi Akhtar (2005) sought to determine whether the effect of

financial leverage on firm performance is similar across the sectors. Debt to total assets ratio was used as a proxy for financial leverage while EBIT represented profitability. Upon controlling for firm size variable, the study found a negative and statistically significant relationship between borrowing and profitability among firms selected form both sectors. The study therefore concluded that industry dynamics did not influence the leverage-profitability relationship. The findings of the study were in concurrence with those of Amjed (2007) whose study compared the effect of debt on corporate financial distress among firms listed in textile and energy sectors in Pakistan. In the study, the ratio of total debt to total equity represented the level of borrowing while performance was measured by use of EPS. The results of the study indicated a negative and significant relationship between the two variables in both sectors.

However, in a similar study carried out among firms listed in different sectors in JSE, South Africa, Rayan (2010) found that the effect of leverage (debt) on financial distress of firms differed across the sectors. In the study that used both random and fixed effects, debt-equity ratio was used as a measure of leverage while EPS proxied corporate financial distress. He attributed this variance to the behavior of firms listed in capital-intensive sectors such as construction and manufacturing to use more debt than equity to finance their assets; hence exposing themselves to risks of financial distress. The findings from this study reflected those by Phung and Le (2013) who undertook a study aimed at comparing the effect of leverage (debt use) on financial distress of 33 and 42 firms listed in Vietnam's manufacturing and services sectors respectively. The study results revealed that despite the effect of debt financing being adverse in both cases, the effect was significant among firms listed in manufacturing industry while it was insignificant in services sector. The authors attributed this difference to the preference for debt capital by manufacturing-oriented firms as compared to those in services sector.

With regard to debt maturity, authors have presented mixed findings on how the effect of long term and short term debt on financial distress of firms varies across the sectors. In a study of how debt structure affected financial distress of 20184 Ukrainian firms listed in seven sectors over 2001-2010, Salim and Yadav (2012) found that use of long term debt positively affected the financial distress of firms listed in construction, petroleum and manufacturing sectors. However, firms listed in commercial and services sectors showed a negative relationship between the two variables. The findings of this study agrees with those of Onaolapo and Kajola (2010) whose study of the firms listed across 26 sectors in Nigeria stocks Exchange showed that the effect of long term and short term debt on financial distress of firms varied from one sector to the other. The authors attributed the variations to the suitability of different sources of debt capital to finance specific aspects of firm operations.

The results of the cited studies however conflicts with those by Chowdhury and Chowdhury (2010) whose study of 171 firms listed across 9 sectors in Bangladesh showed that the relationship and significance between debt maturity and financial distress of firms remained the same across the sectors. The findings mirrors those by Huang (2006) who examined the relationship between debt maturity and the growth rate of 1216 firms listed in six different sectors in China over the 10 year period 1994-2003. The study used both the book long term debt ratio, and market long term debt ratio to proxy debt maturity while earnings-price ratio was used to represent growth. The empirical results showed that in all sectors, long term debt had a positive and significant influence on growth of firms.

Empirical studies have also derived varying results on how sector-specific factors influence the manner in which different sources of equity structure affects the financial distress of corporations. While some studies have shown that this relationship remains unchanged from sector to sector (sector-specific dynamics are not important), other authors have provided evidence that the manner in which different sources of equity financing affects financial distress of firms differs from one sector to another.

In a study that sought to evaluate how sector-dynamics influences the effect of leverage on corporate growth among the Malaysian firms, Salim and Yadav (2012) tested how use of both internal and external equity financing affected stock prices of the firms listed in manufacturing, investments and energy sectors. The study found that use of internal equity had a positive and significant effect on stock price movements of firms listed across the three sectors. However, the study found that the effect of external equity differed from sector to sector; with the effect being negative among firms operating within manufacturing and energy sectors and positive among firms in investments sector. The findings of the study concurred with those by Wuxiang and Yong (2001) whose similar study of Korean firms listed in different sectors found that the effect of equity structure on corporate financial distress was different across the sectors.

The findings of these studies however differed from those by Kapopoulos and Lazaretou (2007) whose study analyzed the effect of IPO financing on liquidity situation of firms listed across 4 sectors in Athens Securities Exchange (Greece). The study revealed that over the study period of five years, the relationship between IPO financing and distress of the firms as measured by cash flow for operations and net working capital ratio was negative and significant across all the sectors. The authors therefore concluded that the pecking order theory of capital structure was applicable in all sectors. These findings were in agreement with those by Frank and Goyal (2003) that sought to test the validity of pecking order hypothesis of capital structure on American firms listed across different sectors found that the theory applied uniformly across the sectors.

2.4.7 Financial Distress

The question of assessing financial distress has a long history in finance literature. Over the decades researchers and theoreticians have investigated this subject by developing new approaches to predict financial distress and bankruptcy. According to Outecheva (2007), financial distress prediction techniques are either accounting or market based depending on the nature of information employed. The author noted that while

accounting-based models adopt information contained in the financial statements to determine financial distress, market-based models consider the information contained in the securities traded by the entity in the capital market.

Each of the approach used to measure financial distress has advantages and limitations. First, the efficient market hypothesis underlying the market-based models is a very strong assumption which can lead to potential biases in estimated probabilities of default (Outecheva, 2007). Further, the models rely on the future market value of assets and the volatility of asset returns which are not directly observable in the market but requires to be estimated. Nonetheless, Hillegeist, Keating, Cram, and Lundstedt (2004) noted that despite the shortcomings of market-based models, the default information used in these models is directly extractable from market prices and provides more updated asset values dependent on the chosen frequency: daily, monthly, quarterly.

According to Muller, Steyn-Bruwer, and Hamman (2009), accounting-based models have been criticized on the basis that financial information, such as profitability, liquidity, and solvency ratios is past-oriented and may therefore not provide the current status of the firm. Also, accounting information is prepared based on conservative accounting principles which may result in misstatement of critical factors (Bellovary, Giacomino, & Akers, 2007). However, according to Gharghori, Lee, and Veeraraghavan (2009) in spite of these perceived limitations, accounting information is observable and readily available and hence suitable for distress prediction. Further, Hillegeist et al. (2004) stated that the relative simplicity and inherent accuracy of accounting-based models have made these techniques the most popular analytical tool for financial distress assessment in empirical research.

Beaver (1966), pioneered the studies on financial distress prediction using a univariate analysis model by applying different financial ratios one at a time. In his study of 79 failed and 79 non– failed firms in the US over the period 1954 – 1964, he performed a dichotomous classification test of the predictive ability of the 30 selected financial

ratios. Based on the results of the study, the author derived six ratios which were considered the most powerful predictors of corporate failure. The parameters included: cash flow to total debt, net income to total assets, total debt to total assets, working capital to total assets, current ratios and the no-credit interval. He showed that the chosen financial ratios were considerably depressed among the failed firms in comparison to non-failed firms up to five years prior to bankruptcy.

The significance of this model to the study is that it identifies capital structure (leverage), profitability and liquidity measures as key predictors of financial distress. The implication of this finding is that highly indebted firms that are generally financially distressed. However, despite the simplicity of the univariate model, it was criticized on various fronts. First, use of an individual financial ratio to predict failure was considered a limited approach that may give inconsistent and confusing classification results for different ratios in the same firm (Altman, 1968). Further, the model failed to appreciate that there are various factors that encompass the financial health of the firm; hence a single financial ratio cannot include all information (Edmister, 1972).

In response to these criticisms, Altman (1968) employed the multivariate discriminant approach to financial distress prediction. In a study that sampled 33 bankrupt and 33 non–bankrupt firms in the US's manufacturing sector during the period 1946–1965, he derived a combination of five financial ratios which were considered to be the best discriminants among distressed and non-distressed firms; and therefore the most significant indicators of financial distress. These ratios that comprised liquidity, retained earnings, profitability, leverage and sales turnover were used to estimate a regression model that derived the Z-score index to measure financial distress. The author found that firms whose Z-score exceeding 2.67 were generally safe zone. On the contrary, companies whose Z-score fell below 1.81 were financially distressed, while firms whose Z-score fell between the two measures were classified under the grey zone.

However, the initial model was criticized on the basis that its application was only restricted to large manufacturing firms that were listed in the exchange market (Outecheva, 2007). Further, the model was criticized on the basis of its scope of application that was limited to developed economies (Platt & Platt, 2002). In response, Altman (1993) re-estimated the model to include firms of all sizes and modified it for the emerging markets as specified in appendix iv

It is notable that the model was applied to test both the Enron and WorldCom cases and the scores showed there were warning signs before the bad news was exposed. Particularly, Enron's Z-score was below the safe zone in June 2001 before filing for bankruptcy under Chapter 11 of the United States Bankruptcy Code on December 2001. In addition, WorldCom's Z-score was below the safe zone at the end of the first quarter of 2002 a few months prior to filing for bankruptcy in mid–July 2002. In addition, it is evident that the model's application in emerging markets e.g. Mexico, Brazil and Argentina yields successful results in predicting corporate collapse (Altman & Hotchkiss, 2010). According to Sitati and Odipo (2011), the model has demonstrated an impressive result for the model when applied to non–manufacturing firms. However, despite the MDA models exhibiting relatively superior accuracy, the validity of the model has been questioned on the basis of its statistical assumptions that include normal distribution of ratios, linearity of variables and equality of variance–covariance matrices of ratios for both groups. According to Platt and Platt (2002) these restrictive assumptions led researchers to develop other multivariate statistical tools to overcome these limitations.

In an effort to alleviate the limitations of MDA models, Ohlson (1980) derived the O-score model that predicted financial distress by using the probabilistic approach. In contrast to the MDA model, the O-score model adopted the logistic regression technique based on a cumulative probability function and produced the probability of a firm being classified as belonging to an a priori group according to the financial characteristics of the firm (Ohlson, 1980). This was done by producing a non-linear probability model in

which the dependent variable is not continuous, but performs a discrete characteristics such as distressed or non-distressed firms.

By analyzing 105 bankrupt and 2058 non-bankrupt US firms during the period 1970–1976, Ohlson (1980) applied a probabilistic estimation of insolvency and developed a logit model that comprised of nine explanatory variables. Particularly, he broadly categorized the identified variables into firm size, leverage, liquidity, profitability and growth and observed that they formed the most powerful predictors of financial distress in the analyzed firms. Similar to the discriminant analysis, this technique weighted the identified variables in deriving the O-Score that estimated the probabilities of default for each firm in the sample. Different from the MDA that derived the Z-score index through linear combination of the variables, logit approach incorporated the non-linear effects and used the logistic cumulative distribution function to maximize the joint probability of default for the distressed firms and the probability of non-failure for the healthy companies.

However, a comparison of the predictive accuracy of the logistic regression models with the Altman's multivariate discriminant analysis by means of the same set of variables and the same sample resulted to similar results or very modest improvement. In reference to his model, Ohlson wrote that "a logit analysis is not an econometric method designed to find an "optimal" frontier, trading off one type of error against another. This is in contrast to multivariate discriminant models which satisfy optimality conditions under appropriate assumptions"(Outecheva, 2007). Ohlson therefore introduced a new econometric technique to forecast the probability of default. However, according to Keasey and Watson (1991), the logistic regression analysis offers as much as any other technique to the user.

Just like the MDA models, the importance of this financial distress model for the study is that it identifies specific determinants of financial distress. Specifically, it isolates the firm size, leverage, liquidity, profitability and growth as key predictors of the O-score

index that is directly related to probability of financial distress. The implication of the model is that firms that have high debt ratios are more likely to experience financial distress; as are firms with low profitability, liquidity and growth parameters.

2.5 Critique of Existing Literature

Review of literature indicate that majority of past empirical studies have analyzed the effect of capital structure on the firm based on different indicators of financial distress. The most popular measures have been based on profitability, liquidity, firm value, EPS and stock returns. These parameters however only provide a restricted scope of the overall corporate financial health and quality. This conclusion derives from Moorhouse (2004) who stated that while corporate financial performance considers the short term situation of the firm's overall operation such as profitability. However, financial distress provide a holistic and comprehensive approach in assessing corporate financial viability. Further, Outecheva (2007) stated that evaluating financial distress prediction involves more than just the analysis of corporate profitability.

Secondly, it is evident from review of literature that even in situations where similar indicators of corporate distress have been employed, conflicting empirical results have been provided. Specifically, while some studies have provided for a negative effect, others have shown positive relationship; while others have postulated null relationship. This lack of convergence implies that the manner in which capital structure influences corporate financial distress is still inconclusive.

Thirdly, it can be deduced from literature that the effect of capital structure has largely been analyzed from the standpoint of debt financing. To this end, many researchers have commonly adopted debt ratios as proxies of capital structure. While this tendency may be attributed to the need to evaluate the leverage effect, it gives an inadequate scholarly perspective of the effect of capital structure as it excludes the effects of debt maturity and equity structure on financial distress of corporations. The implication is that the

findings provided by past studies are not exhaustive. This study sought to address this gap by separately analyzing the effects of debt maturity and equity structure on corporate financial distress alongside the leverage effect of capital structure.

2.6 Research Gaps

The review of literature indicate that majority of past empirical studies have investigated the effect of capital structure based on individual indicators of financial distress. These indicators include profitability, liquidity, firm value and stock returns. According to Huang (2006), profitability of a firm may not provide a holistic assessment on the overall firm quality. This is because firms may be profitable but underfunded at the same time. Further, Hoque et al. (2014) opined that financial performance parameters provide a limited assessment of the overall financial health of corporations. The addresses this gap by adopting the Altman's Z-score of financial distress as modified for emerging markets; which is a direct measure of corporate financial viability.

Secondly, studies provide evidence that there is generally lack of scholarly convergence in empirical findings even in situations where similar indicators of financial distress have been adopted. Specifically, while a study by Mwangi et al. (2014) revealed that capital structure affects profitability negatively, a similar study carried out by Velnampy (2013) showed that capital structure mitigates corporate financial distress. Further, a study by Ebaid (2009) showed that capital structure has no effect on financial distress. This divergence in empirical findings imply that the effect of capital structure on corporate financial distress is still unclear. This study seek to address this gap in the perspective of the Kenyan non-financial firms.

Thirdly, it can be deduced from literature that researchers have commonly adopted debt ratios as proxies of capital structure. This approach provides a selective perspective of the effect of capital structure considering that capital structure has got other components such as debt maturity, asset structure and equity structure (Chen, 2004). This study

sought to address this gap by separately analyzing the effects of debt maturity, asset structure and equity structure on corporate financial distress alongside the leverage effect of capital structure.

2.7 Summary

Review of literature has shown that for the past five decades, the subject of capital structure has attracted significant interest among the finance scholars. This has given birth to many capital structure theories that seek to explain how financing decisions affects the firm. As pointed out earlier, this reflects the level of importance placed at the financing factor at firm level. However, no universal theory has been adopted to date.

It can also be deduced that majority of empirical studies have generally investigated the effect of capital structure based on performance variables such as profitability, firm value, liquidity and stock returns. However, these studies have provided conflicting results; with the implication that the effect of capital structure on corporate performance is unclear. By using corporate performance to study the effect of capital structure on the firm, the studies offers a narrow view in their methodological approach. This study addressed this gap by adopting financial distress; which has been applauded as a comprehensive method of analyzing overall financial distress of the firm.

The literature also show that there exists numerous approaches to predicting corporate financial distress. Depending on the nature of data used to estimate the models, they can be broadly categorized into accounting-based and market-based models. The most popular accounting-based models; which rely on data from financial statements include the Beaver's (1966) univariate model, Altman's (1968, 1993 and 2000) multi-variate discriminant models as well as the Olhson's (1980) logistic probability model. It is however notable that in spite of the perceived limitations attributed to accounting-based models, they are the most popular models since their results are insulated from the inherent distortions in market information.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides a description of the methods and approaches adopted in carrying out this study. It covers the research design, target population, sampling frame, census, data collection and analysis techniques as well as methods of testing the suitability of the data used by the study. The chapter also specifies the empirical models estimated by the study and provides the techniques of estimating and analyzing the model.

3.2 Research Design

Kothari (2004) defined research design as a master plan that specifies the methods and procedures for collecting and analyzing the needed information. A research design is the structure, or the blueprint of research that guides the process of research from the formulation of the research questions and hypotheses to reporting the research findings (Wanjiru, 2015). The study used quantitative research design. This research design was selected for the study since the data collected on the study variables was in financial ratios and hence of quantitative nature. The financial ratios computed for each firm during the period of study were then transformed into panels. This approach is useful for this kind of study where both the cross-sectional and longitudinal characteristics of the units being analyzed constitute an important ingredient of the study (Gujarati, 2003).

3.3 Target Population

Population refers to an entire group of individuals, events or objects having common characteristics that conform to a given specification (Mugenda & Mugenda, 2003). The population of the study comprise the non-financial companies listed in the NSE as at December 2013. In total, there were 41 non-financial firms listed in the NSE as at that

date and participated in the study. The companies are listed across 7 sectors as shown on Table 3.1:

Table 3.1: Non-financial firms listed in NSE by sectors

Sector	Number of firms	Proportion
Agriculture	7	17%
Automobiles & accessories	4	10%
Commercial & Allied	9	22%
Construction & Allied	5	12%
Energy & Petroleum	4	10%
Investments	4	10%
Manufacturing & Allied	8	20%
Total	**41**	**100%**

Source: NSE, (2013)

The study did not consider firms listed under the banking and insurance sectors since they are associated with tight regulations with regard to capital holding and liquidity operations. This heterogeneity makes it difficult to perform hypothesis testing for the study variables (Mwangi *et al*., 2012). The unit of analysis for the study was individual non-financial firms listed in NSE.

3.4 Sampling Frame

Kothari (2004) defined a sampling frame as a list of all the items where a representative sample is drawn for the purpose of a study. The sampling frame for this study comprised all the 41 non-financial companies listed in NSE as at 31st December 2013 (NSE, 2013).

3.5 Census

Census method involves an exhaustive enumeration of the units constituting the target population (Kothari, 2004). Since the target population comprised 41 non-financial firms listed in NSE, a census of all the firms study was conducted for the study. According to Mugenda and Mugenda (2003), a census is preferred where the population is small and manageable. Further, census method enhances validity of the collected data by eliminating errors associated with sampling (Saunders, Lewis, & Thornhill, 2009).

3.6 Data Collection Instrument

The study employed secondary data that was extracted from audited financial statements and annual reports of individual non-financial firms over the 10-year period, 2004 to 2013. Collection of data was accomplished by means of the secondary data collection instrument specified in Appendix II. The instrument aided in collection of accounting data necessary to compute the Altman's Z-score of financial distress. In addition, data relating to financial leverage, debt maturity, equity structure, assets tangibility and sales growth was collected.

3.7 Data Collection Procedure

Collection of data involved visiting the websites of the listed non-financial companies and downloading the published financial statements for the 10 years period studied. Using the data collection instrument, the information on specific components was keyed in for each firm for every year. In order to verify the authenticity of the collected data, the same was cross-checked by using the hand book summaries obtained from NSE

website for the period of study. Where differences were noted, the data obtained from the published financial statements was given preference considering that the same had been published for public consumption. The data was then uploaded in Excel program and converted into ratios. The rations were then converted into panels ready for analysis.

3.8 Pilot Study

The study employed secondary data that was collected by means of pre-designed instrument specified under appendix II. The instrument was designed by the help of experts in finance who includes Lecturers in the Finance field and Finance Managers. To ensure that the instrument captured all the necessary information to determine the required financial ratios, the instrument was discussed with the experts prior to data collection and the necessary review done. Having agreed on the adequacy of the instrument, no further piloting was conducted on the instrument prior to data collection

3.9 Data Analysis and Presentation

The study collected secondary data from all the 41 non-financial firms listed in NSE during the period 2004 – 2013. This approach was guided by econometric theory that advocated for panel data analysis to achieve better regression results (Baltagi, Bratberg, & Holmås, 2005). One of the main advantages of panel data is that it enables the researcher to control against unobserved heterogeneity and provides the researcher with both cross-sectional and time-series dimensions; which reduces the likelihood of bias in the parameter estimators.

Upon extracting data from the financial statements and NSE hand books, Excel program was used to compute the ratios relevant for the study variables in each firm across time. Descriptive statistics that include measures of central tendency, dispersion and skewedness were used to summarize and profile the status of financial distress, financial leverage, debt maturity, equity structure, asset structure, sales growth as well as firm size of non-financial firms. Panel regression analysis using Stata Version 11 was

employed to establish how capital structure variables affected financial distress of non-financial firms. Finally, inferential statistics that included F-test (Wald test) and t-test were used to determine the significance of the overall model and individual explanatory variables respectively. Presentation of study results was done by use of tables and graphs.

3.9.1 Measurement of Study Variables

The study adopted financial distress and the dependent variable. Financial leverage, debt maturity, equity structure and asset structure constituted the explanatory variables for the study. The moderating variables comprised the firm size and listing sector. In addition, the study controlled for firm growth. This section provide details of how each of the study variables were measured and operationalized.

a) Financial Distress

Corporate financial distress refers to situation where a firm is unable to meet the financial obligations as they fall due (Andrade & Kaplan, 1998). From this definition, it is clear that contrary to the individual indicators of financial distress such as profitability, firm value, investment growth or liquidity, financial distress depicts a more comprehensive appraisal of the entity's financial status. In that regard, the study employed the Altman's Z-score for emerging markets to determine the financial distress among the studied firms. The researcher considers the financial distress predictor models to be relevant for the study. This is because the target population consists of entities that are still in operation and are therefore considered to be in one level of financial distress or another as encapsulated under the multi-staged hypothesis of firm failure.

This choice is based on the finding that the model is able to provide superior accuracy in predicting financial distress (Zouari & Abid, 2000). Further, it has been empirically found to be effective in predicting financial distress among listed firms in Kenya (Sitati

& Odipo, 2011). The model is further grounded on the MDA statistical technique that provides a suitable mechanism of discriminating between financially sound and unsound firms.

b) Financial Leverage

Financial leverage basically represents the extent to which a firm employs either of the two principal forms of corporate financing; debt and equity. Total equity comprise the sum of paid-up share capital, share-premium, reserves, minority interest and retained earnings (Fabozzi & Drake, 2009). On the other hand, total debt variable represents the combination of current and non-current liabilities. A review of prior empirical literature indicates that debt ratios have been popularly adopted to measure leverage. This could be attributed to the fact that debt presents significant levels of financial risks to the firm in terms of fixed charge payments in form of interest on capital (Bender, 2013). However, in order to capture the leverage effect on both equity and debt financing, the study measured each component of financial leverage as a ratio of total capital in line with recommendation by Pandey (2009).

c) Debt Maturity

In view of Diamond (1993), while financial leverage provides a measure of overall gearing, the mix of short term and long term debt provides the debt maturity effect of the firm. To effectively evaluate the individual effect of each category of debt financing on the firm, Aivazian *et al*. (2005) recommended long term and short term debt to be analyzed separately. In the study, current liabilities represent short term component of total debt while non-current liabilities represent long term debt. To measure the debt maturity effect, the study expressed each category of debt as a proportion of total debt (Khan, 2012; Owolabi & Inyang, 2013).

d) Equity Structure

Equity financing falls into two principal categories: internal and external. Internal equity comprises of internally generated funds that are not distributed to shareholders in form of dividends. The implication is that the funds are ploughed back into the firm to finance assets. Key sources of internal equity include retained earnings and reserves (Bender, 2013). On the other hand, external equity comprises of externally acquired funds except debt (Xiaoyue & Xiaodong, 2001). Key items of external equity include paid-up share capital, share premium and minority interest (Pandey, 2009). In order to capture the equity structure effect, the study measured the each component of equity capital as a ratio of total equity financing in line with studies carried out by (Park & Pincus, 2001; Wuxiang & Yong, 2001).

e) Asset Structure

Asset structure defines the extent to which corporations retain their asset investment in one form or another (Cuong, 2014). The study adopted asset tangibility; which is the proportion of fixed assets in the total assets to measure asset structure. This is informed by prior empirical literature that showed that the two variables have the potential to influence financial distress of the firms as presented under section 2.4.6.

f) Firm Size

The study used size of non-financial firms and the sector within which firms are listed as moderating variables. This was informed by evidence from past empirical studies that the two factors have the potential to alter the relationship between capital structure and corporate financial distress indicators as presented under sections 2.4.5 and 2.4.6. Firm size represents how large or small the studied firm is (Babalola, 2013). Firm size was measured by taking the natural logarithm of total assets (Jónsson, 2008; Mwangi *et al.*, 2014; Surajit & Saxena, 2009).

g) Listing Sector

Non-financial firms in NSE are listed in 7 sectors that consist of: Agriculture, Automobiles and accessories, Energy and Petroleum, Manufacturing and allied, Commercial and Services, Construction and Allied as well as Investments. The study operationalized the listing sector by means of a dummy variable that took a value of 1 if the firm was listed within the sector of interest and 0 otherwise.

h) Sales Growth

The study adopted sales growth to control for differences in sales turnover among the studied firms. This decision is informed by prior empirical literature that showed that the sales growth has the potential to influence financial distress. Sales growth represents the year–on-year changes in turnover. In this study, this metric was measured as the ratio of difference in sales over two subsequent years to previous year's turnover (Cuong, 2014; Kodongo *et al*., 2014; Maina & Ishmail, 2014).

Babalola (2013) Suggested that enterprises of higher growth opportunities generally perform better than those with lower sales growth. In addition, studies by Abor (2005) and Kodongo *et al*. (2014) found that enterprises with higher sales growth rate have higher market value. This points to a positive relationship between sales growth and financial distress. However, studies by Cuong (2014), Gupta *et al*. (2014) and Hoque *et al*. (2014) showed that sales growth variable is negatively related to financial performance of the firm. Authors have attributed the negative association to the fact that higher sales growth normally require huge capital to finance turnover. Considering the empirical findings from studies conducted on non-financial firms listed in Kenya, the study postulates a positive relationship between sales growth variable and financial distress. A summary of the constructs for each variable used in the study together with their measurements are summarized on Table 3.3

Table 3.2: Summary Measurement of Research Variables

Variables	Measurement	Notation	Expected Sign
Independent Variables			
Financial Leverage	Total debt/Total capital	TD	- ve
	Total equity/Total capital	TE	+ ve
Debt Maturity	Non-current liabilities/Total Debt	LTD	+ ve
	Total current liabilities/Total Debt	STD	- ve
Equity Structure	Total internal equity/Total equity	IE	+ ve
	Total external equity/Total equity	EE	- ve
Asset Structure	Total Fixed assets/Total assets	TANG	- ve
Moderating variables			
Firm size	Natural logarithm of total assets	SZ	+ ve
Sector	Dummy, taking value of 1 if firm is listed within the sector and 0 otherwise	D	+ ve
Control variable			
Sales growth	$\frac{Sales_t - Sales_{t-1}}{Sales_{t-1}}$	SG	
Dependent Variable			
Financial Distress	Altman's Z-score index of financial distress (Appendix IV)	FD	

3.9.2 Panel Regression Model Estimation

Generally, three techniques may be adopted by researchers to specify and estimate panel regression models: Pooled Regression Model, Fixed Effect Model, and the Random Effects Model. Pooled regression model is also known as the constant coefficients model with reference to both the intercept and slope. It is the simplest among the three models in panel data analysis. It is however the most restrictive as it disregards the space and time dimensions of pooled data. It is best suited in situations where there is neither significant cross-sectional or temporal effects and involves pooling all the data and running an ordinary least square (OLS) regression model. The major problem with this model is that it does not distinguish between the various cross sections involved in the study; i.e. by pooling all the firms, we deny the heterogeneity or individuality that may exist among them(Gujarati, 2003). The general presentation for pooled regression model may be made as follows:

$$Y_{it} = \alpha_i + \sum_{i=1}^{8} \beta_i X_{it} + \mu_{it} \quad \text{...} \quad (1)$$

Where;

Y_{it} is the regressand,

X_{it} is the vector of regressor variables,

βi is the coefficient of the regressor variable,

i refers to the firm and t is the time.

Fixed effect model estimation on the other hand involves designing the regression model that allows for the intercept to vary across space (individual firms) with the slope coefficients remaining constant; hence the term "fixed effects". By so doing, the model

captures the differences in individual characteristics of the entities being studied such as management style or philosophy hence improving the reliability of the regression results (Gujarati, 2003). This is achieved by employing the mean differencing or differential intercept dummies technique; hence the term least-squares dummy variable (LSDV) model. Under this study, the fixed effect model with time invariant intercept term may be designed as follows:

$$Y_{it} = \alpha_{1i} + \sum_{i=1}^{8} \beta_i X_{it} + \mu_{it} \quad \text{..... (2)}$$

Where;

Y_{it} is the regressand,

X_{it} is the vector of regressor variables,

βi is the coefficient of the regressor variable,

i refers to the firm and t is the time.

The LSDV model form could be expressed as follows:

$$Y_{it} = \alpha_1+\alpha_2 D_{2i}+\alpha_3 D_{3i}+\alpha_n D_{ni}+\beta_1 X_{1it}+\beta_2 X_{2it}+\mu_{it} \quad \text{..... (3)}$$

Where;

D_i = is the dummy variable that equals to 1 if the observation X belongs to firm I and 0 otherwise and ranges from 1 to n-1.

Another way of specifying the fixed effect model involves designing the regression model that allows for the intercept to vary across both space (individual firms) and time with the slope coefficients remaining constant. By so doing, the model captures not only

the cross-sectional characteristics such as differences in management style or philosophy but also time-induced differences such as technological changes, regulatory and/or tax policy changes, and external effects such as wars or other conflicts. Under this study, the fixed effect model with time variant intercept term may be designed as follows:

$$Y_{it} = \alpha_1+\alpha_2 D_{2i}+\alpha_3 D_{3i}+\alpha_n D_{ni}+\lambda_0+\lambda_1 Dum_{1t}+\ldots\ldots+\lambda_t Dum_t+\beta_1 X_{1it}+\beta_2 X_{2it}+\mu_{it}\ldots\ldots\ldots \quad (4)$$

Where:

D_i = is the dummy variable that equals to 1 if the observation

X belongs to firm i,

0 otherwise and ranges from 1 to n-1.

Dum_t = is the time dummy variable that equals to 1 if the observation belongs to year t, 0 otherwise and ranges from years 2004 to 2013.

Nonetheless, it is notable that despite the advantages of the fixed effect model, introducing too many dummy variables, usually results in reduction of degrees of freedom hence problems of further statistical analysis. Secondly, numerous variables in a regression model normally leads to the possibility of multicollinearity, which might make precise estimation of one or more parameters difficult.

Unlike the fixed effect model that assumes a unique intercept for individual firms with respect to space, time or both, random effects models assume that all the 41 firms involved in the study have an intercept that has a universal mean value equivalent to α_1. Effectively, the differences in their individual features is captured by the intercept term which is reflected as deviations from the mean term α_1. Starting with Equation (2) above, the intercept value for an individual company is expressed as:

$$\alpha_{1i} = \alpha_1 + \varepsilon_i \text{ , where } i = 1,2, \ldots \ldots \ldots ,41 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{ (5)}$$

Where ε_i being the random error term of mean equal to zero and variance of $\sigma^2\varepsilon$.

Substituting Equation (5) into (2), we obtain:

$$Y_{it} = \alpha_1+\beta_1X_{1it}+\beta_2X_{2it}+\varepsilon_i+\mu_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{ (6)}$$

But taking;

$$\pi_{it} = \varepsilon_i + \mu_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{ (7)}$$

Equation 10 is estimated as follows:

$$Y_{it} = \alpha_1+\beta_1X_{1it}+\beta_2X_{2it}+\pi_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{ (8)}$$

From the above, it can be deduced that the composite error term π_{it} consists of two components,ε_i which is the firm-specific, error component, and the μ_{it} which is the combined time series and cross-section error component. For this reason, this model is also called error components model (ECM). In contrast to FEM, REM is parsimonious in that it does not result in loss of degrees of freedom. This is because one does not have to estimate *n* cross-sectional intercepts but just only the mean value of the intercept and its variance.

To determine which model provides superior results between the random effects and fixed effects models, Hausman test was undertaken. This involves sequentially estimating both models (starting with FEM) against the alternative hypothesis that the random effect model is appropriate at 5% confidence level. The Hausman test provided a chi-square value and a corresponding *p*-value which formed the basis of accepting or rejecting the null as appropriate.

3.9.3 Statistical Model

Model specification involves coming up with a combination of study variables that represents the empirical relationship between the dependent, explanatory and moderating variables. This was done in line with the conceptual framework illustrated under section 2.3.

The study employed panel regression models to analyze secondary data as the secondary data collected exhibited both time series and cross-sectional dimensions. Since the study sought to determine both the primary (main) effects of capital structure on financial distress as well as the moderating effects of firm size and sector on this relationship, three panel regression equations were specified as follows:

$$FD_{it} = \alpha_0 + \sum_{i=1}^{7} \alpha_i X_{it} + \mu_{it} \quad \text{.. (9)}$$

$$FD_{it} = \alpha_0 + \sum_{i=1}^{7} \alpha_i X_{it} + \sum_{i=1}^{1} \theta_i Z_{it} + \mu_{it} \quad \text{... (10)}$$

$$FD_{it} = \alpha_0 + \sum_{i=1}^{7} \alpha_i X_{it} + \sum_{i=1}^{7} \beta_i (X_i * SZ_{it}) + \sum_{i=1}^{2} \theta_i Z_{it} + \mu_{it} \quad \text{................ (11)}$$

$$FD_{it} = \alpha_0 + \sum_{i=1}^{7} \alpha_i X_{it} + \sum_{i=1}^{7} \beta_i (X_{it} * D_i) \sum_{i=1}^{1} \theta_i Z_{it} + \mu_{it} \quad \text{........................ (12)}$$

Where: FD_{it} is Financial distress as measured by the Altman's Z-score index of financial distress as modified for the emerging markets**,** α_0 is the intercept term, α_i are the positive or negative coefficients of the explanatory variables, β_i are the coefficients of the moderating variables**,** θ_i are the coefficients of controlling variables**,** X_{it} is a vector of explanatory variables, Z_{it} is a vector of controlling variables, D_i is the sector dummy variable, taking a value of 1 if the firm is listed in that sector, and 0 otherwise, μ_{it} is the error term (the time-varying disturbance term is serially uncorrelated with mean zero and constant variance).

i = 1,……., 41

t = time in years from 2004 – 2013.

Equation 9 was used to estimate the main effects without control variable while Equation 10 controlled for sales growth to determine whether sales growth improved the predictive strength of the equation. Equation 11 estimated the moderating effects of firm size while equation 12 estimated the moderating effect of sector within which firms were listed.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents the results of analysis of the data collected in line with the research design described in chapter 3. Analysis of data commenced by undertaking a descriptive analysis of the study variables aimed at obtaining the general profile of the data. In addition, appropriate regression diagnostic checks was undertaken on the data so as to determine its suitability for further statistical analysis. Further, an estimation of the panel regression models specified in section 3.9.3 was undertaken and interpretation of the results performed using the inferential statistics; F-test (Wald-test) and t-test. Finally, a discussion of the results is offered in relation to theoretical and empirical literature.

4.2 Findings of Descriptive Statistics

This section presents the descriptive statistical analysis of the collected data based on the results of the entire sample as well as for individual sectors. Summary statistics that encapsulate the measures of central tendency such as the mean, the measures of dispersion such as standard deviation, minimum and maximum observations as well as measures of distribution (Skewedness and Kurtosis) were used.

Table 4.1 Panel Variables Summary Statistics (overall)

Variables	Mean	Std. Dev.	Maximum	Minimum	Skewedness	Kurtosis
Financial distress	8.421	9.494	130.928	-9.848	10.486	132.312
Total debt	0.461	0.215	1.694	0.008	1.520	9.789
Long term debt	0.390	0.285	0.964	0.000	0.239	1.716
Short term debt	0.610	0.285	1.000	0.036	-0.239	1.716
Total equity	0.539	0.215	0.992	-0.694	-1.520	9.789
Internal equity	0.787	0.384	5.986	-1.728	5.622	93.942
External equity	0.219	0.392	2.728	-4.986	-5.258	86.919
Tangibility	0.566	0.227	0.983	0.038	-0.284	2.020
Size(Kshs mil)	4.448	0.005	188.762	57.297	0.001	0.000
Sales growth	0.159	0.353	2.494	-0.633	2.334	13.436

Unbalanced panel of 41 non-financial firms observed for 10 years, Size is in million Kshs, Z-score is the index of financial distress derived from Altman's model for emerging markets, all other variables are in ratios

Table 4.1 show the summary statistics for the secondary data observations of the original sample consisting of 41 firms over the period of analysis (2004-2013). The results indicate that during the analysis period, non-financial firms listed in NSE had a mean Z-score index of 8.421. This depicts a fairly non-distressed status for the firms; signifying that majority of the firms were financially sound in relation to the Altman's distress zones ($Z<4.15$, distress zone; $4.15<Z<5.85$, grey zone; $Z>5.85$, safe zone). However, the corresponding standard deviation of 9.494 show a high variability of distress levels among the firms. This is further evidenced by the extreme observations of -9.848 (Uchumi Supermarkets, 2005) and 130.928 (Centum Investments, year 2008). The result implies that while some firms may be in severe distress, others are quite financially safe as portrayed by appendix III. The coefficient of skewedness value equivalent to 10.486 show that majority of the observations lay on the positive side of the mean Z-score, further confirming that the studied firms are financially sound.

Table 4.1 further show that approximately 46% and 54% of the capital structure adopted by non-financial firms comprise of debt and equity respectively. This finding is in agreement with the findings of the study by Mwangi *et al.* (2014) who found that non-financial firms listed in Kenya employ more equity than debt to finance their assets. The author attributed this preference for equity to high cost of debt in Kenya that discourages the corporate sector from borrowing from commercial banks. The finding however conflicted that by Kodongo *et al.* (2014) who observed that non-financial firms listed in NSE employ more debt than equity. The authors attributed this trend to the fact that commercial bank loan is easier to arrange and acquire than equity that requires approval by the regulator (CMA). The corresponding high standard deviation of 21.6% supported by the wide range between minimum and maximum observations (0.008 – 1.694) on total debt utilization show significant dispersion on borrowing levels among non-financial firms. The implication of this finding is that in spite of some firms being highly indebted, majority were modestly geared. A similar pattern apply on equity financing whose maximum of 0.992 indicated that some firms were almost entirely funded by

equity and a minimum of -0.694 signifying that some companies were technically drifting towards insolvency.

It can also be deduced from the results that approximately 61% of total debt comprises of short term borrowing (repayable within 12 months of balance sheet date) as opposed to long term debt that constitute 39%. This empirical observation signifies preference for short-term debt over long term debt by firms to finance their assets. This disparity could be attributed to the perceived high cost of long-term borrowing as well as inaccessibility for long-term credit from financial institutions due to high collateral requirements in terms of security (Bitok *et al.*, 2011). Another reason could be due to the fact that the Kenyan long-term debt market is still under-developed and hence not readily accessible by non-financial firms (Maina & Ishmail, 2014). The high variability in borrowing levels as evidenced by the high standard deviation show the non-uniformity in the borrowing levels among non-financial firms during the analysis period.

The results output displayed in Table 4.1 denote that the greatest proportion of the firms' equity capital was derived from internal sources (retained earnings and reserves) at approximately 79% as opposed to external equity that approximated 21% of the total equity component. The observation signifies that during the period of analysis, non-financial firms employed the pecking order hypothesis of capital structure; which opine that firms normally prefer to utilize internally generated funds as opposed to externally acquired capital to finance their assets. The results further show a high dispersion on usage levels of each component of equity capital as signified by the standard deviation. Of interest are the negative minimum values which were attributed to high accumulated losses by some firms resulting to depleted equity capital.

The results further showed that the average assets-holding by non-financial firms during the period of study was Kshs 4.448 billion with a standard deviation of Kshs 5,000. The maximum observation was Kshs 188.76 billion while the minimum value was Kshs 57.3 million. The results also demonstrated that 56.6% of the total firms' assets were tangible

(non-current); with a high of 98.3% and a low of 4%. This implied a high assets tangibility among the entities under consideration; indicating that non-financial firms preferred to keep a large proportion of their investment in assets in fixed form. During the period of study, the average growth in sales revenue was 15.9%. The standard deviation of 35.9% signifies significant variation in sales growth as evidenced by the maximum observed sales growth rate was 249.4% and a minimum of -63.3% (decline)

Table 4.2: Sector-wise Financial Distress Summary Statistics

Sector	Mean	Std. Dev.	Max	Min	Skewedness	Kurtosis
Agriculture	9.09	2.08	15.9	4.21	0.78	4.17
Automobiles & accessories	6.69	2.90	11.67	-1.51	-0.88	4.27
Commercial & services	5.78	4.02	12.34	-9.85	-1.52	6.93
Construction & allied	7.20	1.89	11.99	3.95	0.56	2.56
Energy & petroleum	5.55	1.13	8.54	2.07	-0.01	4.87
Investments	18.34	28.37	130.93	4.02	3.43	13.64
Manufacturing & allied	9.41	2.81	17.08	4.07	0.6	2.89

Unbalanced panel of 41 non-financial firms listed in NSE observed for 10 years, Z-score represents the index of financial distress derived from Altman's model for emerging markets.

Table 4.2 show the Altman's Z-score summary statistics for each of the 7 sectors analyzed by the study. The results indicate that commercial and services as well as energy and petroleum sectors recorded the lowest mean Z-score values of 5.78 and 5.55

respectively. Further, the investments sector has the highest mean Z-score value of 18.34. This result signify that whereas firms operating within energy and petroleum and commercial sectors were relatively financially distressed, those listed in the investments sector were largely financially sound. This disparity could be attributed to the fact that firms in the Energy and commercial sectors are more susceptible to negative effects of external economic performance such as foreign exchange rate fluctuations and inflationary pressures as opposed to firms in the investment sector. The results further shows a high variability in Z-scores values within investments sector as depicted by standard deviation value of 28.37. This is supported by the maximum observed value of 130.93 (Centum, year 2008) and minimum value of 4.02 (Olympia capital Ltd, year 2006). In contrast, firms listed in energy sector have less variability in Z-score values as shown by relatively low standard deviation of 1.13. The negative Z-scores exhibited by firms in automobiles and commercial sectors (Marshalls E.A Ltd, years 2010 and 2011; Uchumi Supermarkets, years 2004 to 2009) indicate that the firms were nearly financially impoverished as shown on appendix III. This disparity could be attributed to differences in risk characteristics of individual firms operating in these sectors. Particularly, the energy sector is regarded as severely exposed to negative effects of economic downturn attributable to inflation, foreign exchange fluctuations and rise in interest rates as compared to those in investment sector.

Table 4.3 Sector-wise Summary Statistics for Financial Leverage

Total debt	**Mean**	**Std. Dev.**	**Max**	**Min**	**Skewedness**	**Kurtosis**
Agriculture	0.32	0.09	0.56	0.16	0.57	3.13
Automobiles & accessories	0.53	0.16	0.88	0.24	-0.21	2.35
Commercial & services	0.57	0.28	1.69	0.27	2.38	9.31
Construction & allied	0.52	0.14	0.76	0.26	-0.41	2.32
Energy & petroleum	0.59	0.11	0.8	0.36	-0.31	2.57
Investments	0.31	0.22	0.75	0.01	0.3	2.04
Manufacturing & allied	0.39	0.17	0.86	0.13	0.57	2.91
Total Equity	**Mean**	**Std. Dev.**	**Max**	**Min**	**Skewedness**	**Kurtosis**
Agriculture	0.68	0.09	0.84	0.44	-0.57	3.13
Automobiles & accessories	0.47	0.16	0.76	0.12	0.21	2.35
Commercial & services	0.43	0.28	0.73	-0.69	-2.38	9.31
Construction & allied	0.48	0.14	0.74	0.24	0.41	2.32
Energy & petroleum	0.41	0.11	0.64	0.2	0.31	2.57
Investments	0.69	0.22	0.99	0.25	-0.3	2.04
Manufacturing & allied	0.61	0.17	0.87	0.14	-0.57	2.91

Unbalanced panel of 41 non-financial firms listed in NSE observed for 10 years, Total debt and total equity variables are in ratios.

The results in Table 4.3 show that firms listed in Energy and Petroleum, Commercial and Services, Automobiles and Accessories as well as Construction and allied sectors preferred debt to equity capital in finance their assets. This is opposed to firms in Investments, Agriculture and Manufacturing sectors that exhibited low mean gearing levels. The results also indicate high debt utilization levels among non-financial firms in the highly geared sectors. This is evidenced by observed maximum debt ratios equivalent to 1.69 (commercial sector), 0.88 (Automobiles and Accessories), 0.80 (Energy and Petroleum). Considering that the three sectors posted the lowest mean Z-score values, this empirical observation signifies that highly geared firms are more prone to experience financial distress.

Table 4.4: Sector-wise Summary Statistics for Debt Maturity

Long-term debt	**Mean**	**Std. Dev.**	**Max**	**Min**	**Skewedness**	**Kurtosis**
Agriculture	0.67	0.16	0.95	0.27	-0.32	2.51
Automobiles & accessories	0.14	0.10	0.46	0.00	1.35	4.97
Commercial & services	0.31	0.24	0.76	0.00	0.26	1.68
Construction & allied	0.44	0.25	0.84	0.01	-0.16	1.67
Energy & petroleum	0.37	0.35	0.91	0.00	0.36	1.44
Investments	0.30	0.29	0.94	0.00	0.58	1.96
Manufacturing & allied	0.38	0.27	0.96	0.02	0.80	2.33
Short-term debt	**Mean**	**Std. Dev.**	**Max**	**Min**	**Skewedness**	**Kurtosis**
Agriculture	0.33	0.16	0.73	0.05	0.32	2.51
Automobiles & accessories	0.86	0.10	1.00	0.54	-1.35	4.97
Commercial & services	0.69	0.24	1.00	0.24	-0.26	1.68
Construction & allied	0.56	0.25	0.99	0.16	0.16	1.67
Energy & petroleum	0.63	0.35	1.00	0.09	-0.36	1.44
Investments	0.70	0.29	1.00	0.06	-0.58	1.96
Manufacturing & allied	0.62	0.27	0.98	0.04	-0.80	2.33

Unbalanced panel of 41 non-financial firms listed in NSE observed for 10 years, long term debt and short term debt variables are in ratios.

The results displayed in Table 4.4 shows how different sectors utilized debt maturity during the study period as reflected by long-term and short-term debt levels. The results

indicate that on average, all sectors except agriculture preferred short-term to long term debt. The strong preference for short term debt was evidenced by the observation where some firms' entire debt structure constituted of current liabilities (Longhorn Kenya, years 2009, 2012 and 2013; Nation Media group, year 2010, Scan group, year 2006; Total Kenya, years 2004 to 2008; Centum Ltd, years 2007 to 2010 and Nairobi Securities Exchange, years 2010 and 2011). The marked preference for short term debt by firms could be attributed to the fact that the market for long term debt is not developed in Kenya as compared to developed countries. Preference for long-term debt by firms in agriculture sector could be attributed to the long term nature of agricultural operations.

Table 4.5: Sector-wise Summary Statistics for Equity Structure

Internal equity	**Mean**	**Std. Dev.**	**Max**	**Min**	**Skewedness**	**Kurtosis**
Agriculture	0.87	0.13	0.99	0.48	-1.57	4.41
Automobiles & accessories	0.72	0.24	0.95	0.25	-0.83	2.08
Commercial & services	0.80	0.75	5.99	-1.73	3.60	30.45
Construction & allied	0.82	0.10	0.94	0.50	-1.24	4.45
Energy & petroleum	0.74	0.25	0.99	0.30	-0.52	1.58
Investments	0.75	0.22	0.98	0.40	-0.35	1.43
Manufacturing & allied	0.74	0.18	0.95	0.24	-0.85	2.82
External equity	**Mean**	**Std. Dev.**	**Max**	**Min**	**Skewedness**	**Kurtosis**
Agriculture	0.13	0.13	0.52	0.02	1.57	4.41
Automobiles & accessories	0.46	0.29	0.85	0.08	0.00	1.30
Commercial & services	0.20	0.75	2.73	-4.99	-3.60	30.45
Construction & allied	0.19	0.10	0.50	0.06	1.24	4.45
Energy & petroleum	0.13	0.18	0.70	0.01	2.02	5.87
Investments	0.25	0.22	0.60	0.02	0.35	1.43
Manufacturing & allied	0.26	0.18	0.76	0.05	0.85	2.82

Unbalanced panel of 41 non-financial firms listed in NSE observed for 10 years, internal and external equity variables are in ratios.

Table 4.5 shows how different sectors utilized different sources of equity capital to finance their assets during the period of study. The results demonstrate a clear preference for internal equity over external equity across all the seven sectors within which non-financial firms are listed. This finding concurs with the results by Ongore (2011) whose study that sought to test whether firms listed in NSE adopted pecking order hypothesis in their capital structure found a marked preference for internal sources of finance over external sources. The author attributed this behavior to the high cost of obtaining external financing from the Kenya's financial markets. Disparity in utilization of different sources of equity finance is further reinforced by the observation concerning firms whose equity structure constituted 99% internal equity. The strong preference for internal equity by non-financial firms could be attributed to the fact that it is cheaper in that it does not involve issue costs. Besides, internal equity preserves the ownership structure of firms and does not expose the firm to external obligations in terms of payment of dividends.

Table 4.6: Sector-wise Summary Statistics for Asset Structure

Tangibility	**Mean**	**Std. Dev.**	**Max**	**Min**	**Skewedness**	**Kurtosis**
Agriculture	0.71	0.15	0.91	0.23	-0.99	3.52
Automobiles & accessories	0.36	0.16	0.83	0.16	1.25	4.12
Commercial & services	0.58	0.24	0.88	0.04	-0.75	2.41
Construction & allied	0.56	0.19	0.82	0.17	-0.51	1.80
Energy & petroleum	0.51	0.28	0.91	0.13	0.11	1.32
Investments	0.67	0.22	0.98	0.28	-0.04	1.88
Manufacturing & allied	0.50	0.16	0.77	0.16	-0.43	2.45

Unbalanced panel of 41 non-financial firms listed in NSE observed for 10 years, Tangibility is in ratio

The results presented in Table 4.6 show that firms in agriculture sector had the highest mean assets tangibility ratio (71.3%) while those in automobiles sector had the least (35.8%). It is also evident that majority of sector firms had most of their assets in fixed form over the period of study with firms in investment sector posting tangibility ratio of up to a maximum of 98%. Large tangibility ratio points towards increased borrowing capacity resulting from high collateral availability.

Table 4.7: Sector-wise Summary Statistics for other Variables

Size	**Mean**	**Std. Dev.**	**Max**	**Min**	**Skewedness**	**Kurtosis**
Agriculture	1,167	4.00	9,436	57.53	-0.59	2.52
Automobiles & accessories	3,048	3.00	14,650	514.00	0.01	2.03
Commercial & services	5,723	5.00	128,315	433.65	0.42	2.14
Construction & allied	6,583	3.00	43,142	493.86	-0.15	2.04
Energy & petroleum	42,287	3.00	189,519	6,261.94	-0.14	2.11
Investments	1,886	5.00	23,915	91.13	0.01	1.73
Manufacturing & allied	5,025	4.00	58,820	822.41	0.21	1.75
Sales Growth	**Mean**	**Std. Dev.**	**Max**	**Min**	**Skewedness**	**Kurtosis**
Agriculture	0.14	0.33	1.59	-0.57	1.35	7.75
Automobiles & accessories	0.08	0.25	0.69	-0.63	0.06	4.61
Commercial & services	0.16	0.39	2.49	-0.49	3.11	19.24
Construction & allied	0.19	0.19	0.76	-0.28	0.49	4.56
Energy & petroleum	0.17	0.39	1.61	-0.43	1.92	7.36
Investments	0.35	0.66	2.07	-0.63	0.96	3.43
Manufacturing & allied	0.10	0.16	0.60	-0.23	0.57	3.78

Unbalanced panel of 41 non-financial firms listed in NSE observed for 10 years, size is in millions Kshs, and sales growth variables is in ratios

Table 4.7 show that the energy sector had the highest mean firm size as proxied by total assets at Kshs 42.287 billion while agriculture sector was least at Kshs 1.167 billion. During the period, the energy sector had the firm with the maximum value of total assets at Kshs 188.7 billion (Kengen, year 2013) while agriculture had the firm with the minimum assets value at Kshs 57.3 million (REA Vipingo, year 2006). Further, the standard deviation results across the sector shows less variability in asset values during the period. Total assets value depicts the ability of the firm to remain solvent over a considerable period of adverse performance. In general, the results indicates that although there were disparities in firm sizes in different sectors, firms within the same sector had no significant variation in their asset values.

Finally, Table 4.7 show that the investments sector experienced the highest average annual growth in sales over the period of study (35.3%) while automobiles and manufacturing sectors had the least (7.7% and 9.6%). The growth in investment sector sales however had the greatest variability as evidenced by the associated standard deviation. Growth in sales points to the stability of the firm's (sectors) cash flow streams and hence ability to cope with instances of financial distress.

4.3 Panel Data Specification Tests

To determine the suitability of the panel data for statistical analysis, various tests were conducted. The tests that aimed at establishing if the panel data fulfilled the cardinal requirements of classical linear regression analysis included: normality test, panel unit root test, multicollinearity test, panel-level heteroscedasticity test as well as serial correlation test. Where violation to these assumptions were detected, appropriate remedies were applied. In addition, panel cointegration test was conducted to determine if the variables used in the study had a long run association. This section therefore presents the results of various diagnostic tests carried out on the data together with the relevant remedial treatment undertaken to ensure suitability of the data

4.3.1 Panel Data Normality Test

Table 4.8: Panel Variables Skewedness/Kurtosis tests for Normality

				Joint	
Variable	**Obs**	**Pr (Skewedness)**	**Pr(Kurtosis)**	**adj chi2(2)**	**Prob>chi2**
otal debt	386	0.0535	0.0000		0.0000
Long term debt	386	0.0535			0.0000
Short term debt	386	0.0228		56.19	0.0000
Tangibility	386	0.9727	0.2552		0.5213
Size	386		1.30		
Sales growth	347	0.0000	0.0000		0.0000
Total equity	386	0.0000	0.0000		0.0000
Internal equity	386		0.0000		. 0.0000
External equity	386		0.0000		. 0.0000
Financial distress	386	0.0000	0.0000		0.0000

H_0: Panel data is normally distributed; Significance level: 5%

Table 4.8 illustrate the results of Skewedness/Kurtosis test on the panel data. The objective of the test is to find out whether or not the data is normally distributed. The test statistic is a chi-square distribution for both individual and joint measures of skewedness and kurtosis. The test was carried out against the null hypothesis of normal distribution.

The results indicate that the chi-square statistic for both individual and joint tests for all variables except size had corresponding *p*-values equal to 0.0000. This means that the alternative hypothesis of normality is rejected at 5% significance level; implying that the data was not normally distributed. Particularly, the large standard deviation and coefficients of skewedness and kurtosis revealed by total debt, total equity, internal equity, external equity, sales growth and Z-score index variables as shown on Table 4.1 signified presence of outliers. To establish the presence of outliers, box plots technique was employed for individual variables as presented by figures 4.1 to 4.6.

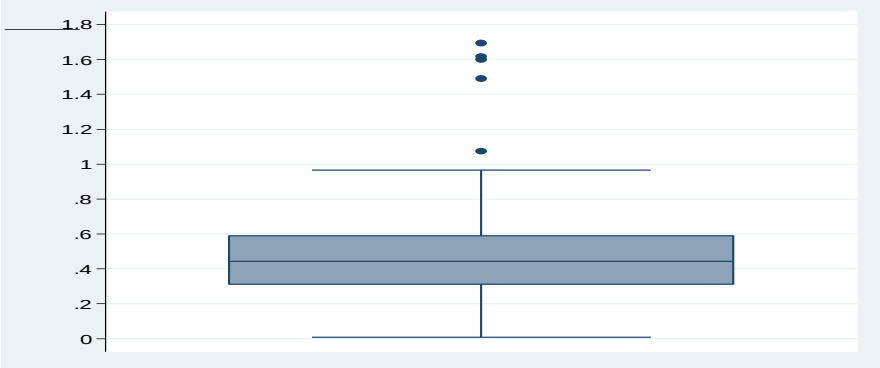

Figure 4.1: Total debt box plots

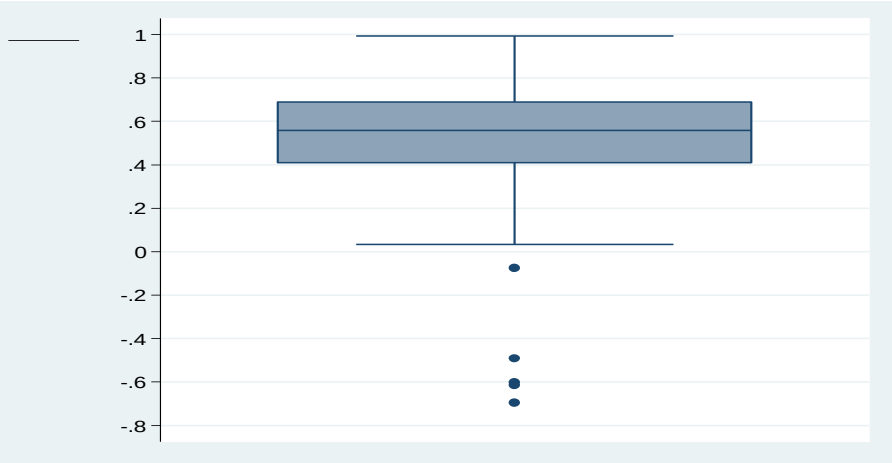

Figure 4.2: Total Equity box plots

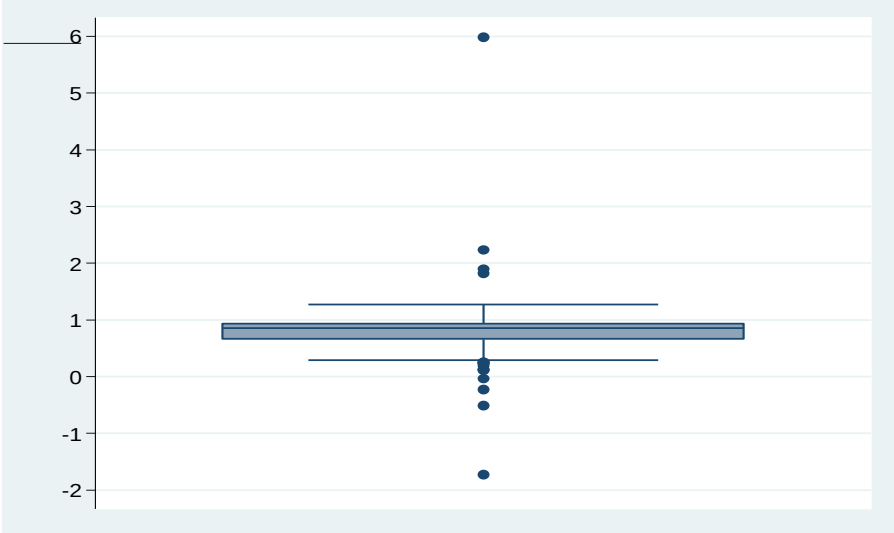

Figure 4.3: Internal Equity box plots

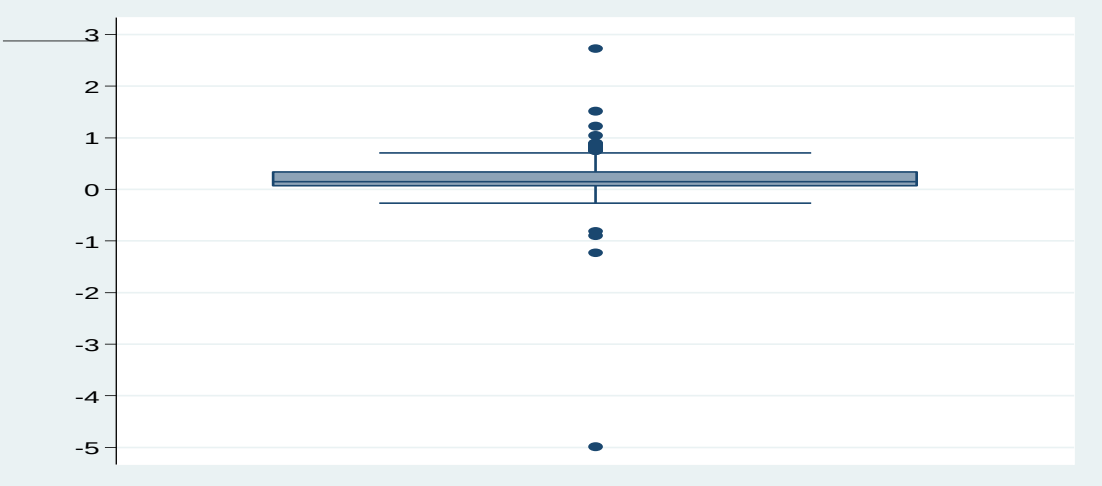

Figure 4.4: External Equity box plots

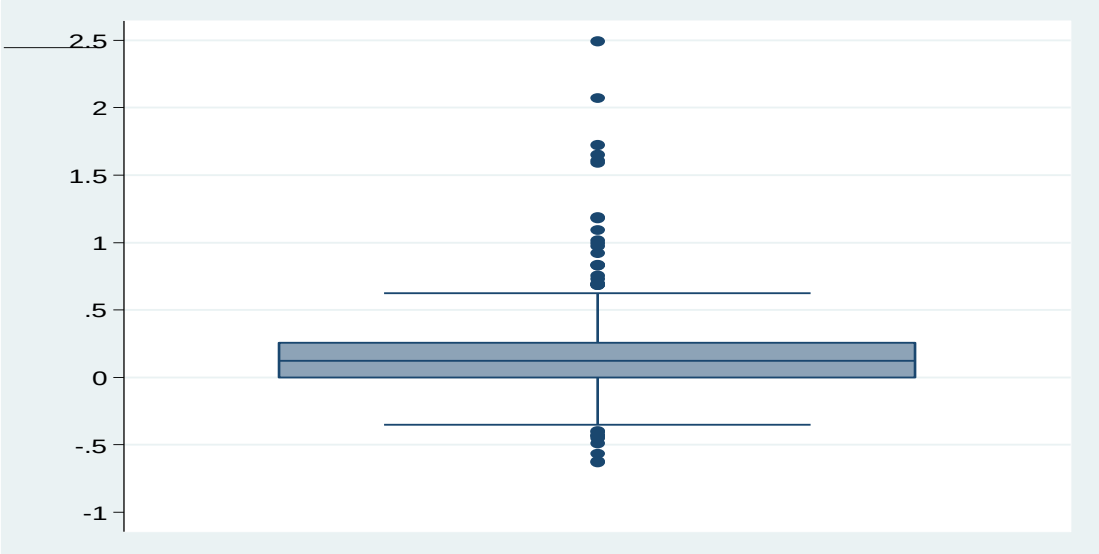

Figure 4.5: Sales growth Box Plots

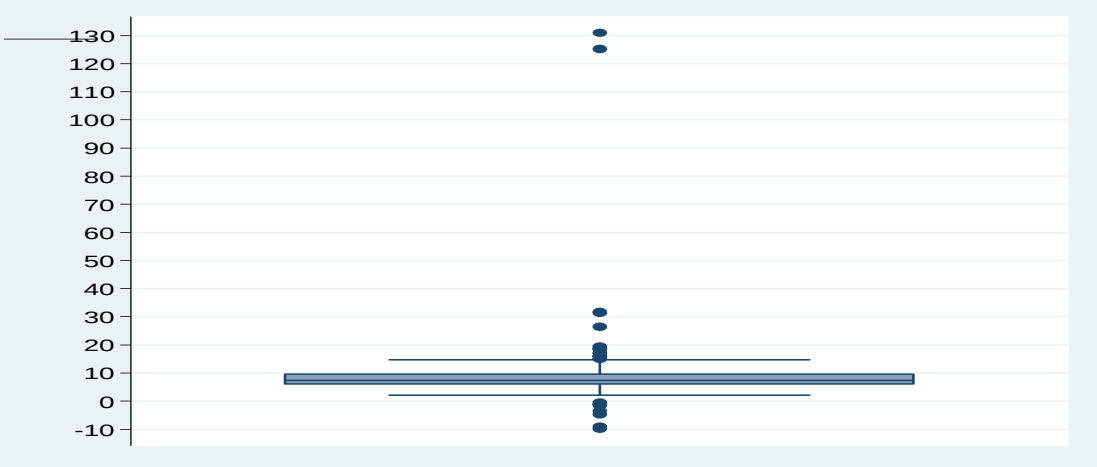

Figure 4.6: Financial Distress box plots

The line in the box represents the median observation while the whiskers shows the largest and least non-outlier observations (1.5 times on either side of first and third quartiles respectively). The observations near the whisker were the near outliers, while those at the extreme are the far outliers. In order to obtain a relatively normally distributed data-set, all the potential far outliers were eliminated. This was achieved by eliminating the firm-year observations that were outside the range: 0<Total debt>1.0, 0<Total equity>1.0, 0<Internal equity>1.30, 0<external equity>1.0, -0.6<Sales growth>1.20, 0<Z-score index>20 for the variables.

This screening process resulted in a loss of 19 firm-year observations on individual variables. The summary statistics for the new data set after eliminating the potential far outliers is shown on the Table 4.9.

Table 4.9 Summary Statistics for the Variables without Outliers

Variables	Mean	Std. Dev.	Max	Min	Skewedness	Kurtosis
Financial distress	7.85	3.01	19.42	-1.51	0.83	4.80
Total debt	0.45	0.17	0.88	0.07	0.09	2.21
Total equity	0.55	0.17	0.93	0.12	-0.09	2.21
Internal equity	0.78	0.20	1.00	0.11	-1.14	3.38
External equity	0.23	0.22	0.89	0.00	1.25	3.65
Sales growth	0.13	0.26	1.19	-0.63	0.76	5.75

Table 4.9 indicate that by eliminating the far outliers, data on the specified variables has been re-distributed. This is illustrated by the coefficient of skewedness and kurtosis values that have reduced to near normal distribution levels of 0 and 3 respectively for all variables except sales growth variable. However, the data was considered good for further analysis considering that sales growth played a controlling role in the model.

4.3.2 Panel Unit Root Test

Panel unit root test was applied on all variables used in the analysis in order to determine whether or not the panel data was stationary. This involved solving for the value of ρ in the general equation:

$$Y_{it} = \alpha + \rho Y_{it-1} \pm \mu_{it} \quad \text{..... (13)}$$

Where:

t = 1….10 years and i = 41 firms

If ρ = 1, it implied that the observation Y_{it} was dependent on its lag value Yi_{t-1} and hence the data was non-stationary. The converse would be true if ρ<1. The necessity of this procedure was to avoid a situation where the obtained regression results were spurious; hence jeopardizing testing of hypothesis concerning the significance or otherwise of the explanatory variables (Granger & Newbold, 1974). The result of the panel unit root test for all variables has been laid out on Table 4.10.

Table 4.10: Panel Unit Root Test Results

Variable	Test	Statistic	*p*-value	Statistic	*p*-value
		Without trend		With trend	
Financial distress	Levin-Lin-Chu	-32.3596	0.0000	-29.6883	0.0000
	Fisher-type -PP	150.2357	0.0000	244.1080	0.0000
	Fisher-type -ADF	150.2357	0.0000	244.1080	0.0000
Total debt	Levin-Lin-Chu	-18.1644	0.0000	-31.7803	0.0000
	Fisher-type -PP	246.6892	0.0000	221.2437	0.0000
	Fisher-type -ADF	246.6892	0.0000	221.2437	0.0000
Long-term debt	Levin-Lin-Chu	-9.7800	0.0000	-13.9031	0.0000
	Fisher-type -PP	179.6664	0.0000	147.3211	0.0000
	Fisher-type -ADF	179.6664	0.0000	147.3211	0.0000
Short-term debt	Levin-Lin-Chu	-9.0145	0.0000	-13.5584	0.0000
	Fisher-type -PP	242.8564	0.0000	219.8822	0.0000
	Fisher-type -ADF	242.8564	0.0000	219.8822	0.0000
Total equity	Levin-Lin-Chu	-22.3505	0.0000	-34.6432	0.0000
	Fisher-type -PP	140.4003	0.0010	124.8215	0.0000
	Fisher-type -ADF	140.4003	0.0010	124.8215	0.0000
Internal equity	Levin-Lin-Chu	-49.3305	0.0000	-17.2045	0.0000
	Fisher-type -PP	206.6005	0.0000	93.8153	0.1385
	Fisher-type -ADF	206.6005	0.0000	93.8153	0.1385
External equity	Levin-Lin-Chu	-4.7246	0.0000	-26.4000	0.0000
	Fisher-type -PP	183.8243	0.0000	186.8552	0.0000
	Fisher-type -ADF	280.5745	0.0000	183.8243	0.0000
Tangibility	Levin-Lin-Chu	-45.7073	0.0000	-36.8190	0.0000
	Fisher-type -PP	134.4934	0.0001	171.9637	0.0000
	Fisher-type -ADF	141.5475	0.0000	134.4934	0.0001
Size	Levin-Lin-Chu	-65.1811	0.0000	-26.6006	0.0000
	Fisher-type -PP	188.8175	0.0000	193.0272	0.0000
	Fisher-type -ADF	159.0377	0.0000	188.8175	0.0000
Sales growth	Levin-Lin-Chu	-8.2530	0.0000	-8.7806	0.0000
	Fisher-type -PP	253.8599	0.0000	271.9946	0.0000
	Fisher-type -ADF	352.5298	0.0000	253.8599	0.0000

The *p*-values for the Fisher tests were based on asymptotic Chi-square distribution. The LLC test is based on asymptotic normality.

The results presented on Table 4.10 are based on Levin-Lin-Chu, the Fisher-type Augmented Dickey and Fuller (ADF) and the Fisher-type Phillips and Perron (PP) tests with and without time trend. The null hypothesis was that panel data was non-stationary

i.e. [(H0): $\rho = 1$] against the alternative hypothesis that the data was stationary i.e. [(H0): $\rho < 1$]. Both LLC and Fisher-type tests were employed because of their effectiveness in handling unbalanced panel data such as the one used in the study (Mahadeva & Robinson, 2004). Particularly, the LLC provides for heterogeneity of individual effects by generalizing the specified model. In addition, it provides for heterogeneous serial correlation structure of the error-terms, by assuming homogenous first-order regressive parameters. Both the result of ADF and Phillips Perron (PP) are presented for comparison purposes. This is based on the observation by Maddala and Wu (1999) that unlike the ADF test which is parametric, the PP test is non-parametric and hence robust in presence of serial correlation in the error terms without adding lagged difference terms. In addition, the tests played a confirmatory and complementary role to the findings of LLC test.

The results based on the LLC, Fisher-type ADF and Fisher-type PP panel unit root test procedures corresponded to the 10 variables that were used in the study. The null hypothesis of "non-stationarity" was rejected if the associated *p*-value was less than the conventional 5% statistical level of significance based on consistency of the test statistic results of the 3 methods. However, LLC test results were considered with much weight since they were more accurate. Test results indicated that all the variables used in the study were stationary since the ρ-values associated with the respective test statistics were less than 0.05. Rejection of the null hypothesis implied that the 10 variables were used in levels instead of their first difference.

4.3.3 Panel Multicollinearity Test

Pair-wise correlation was used to examine the level of collinearity present between explanatory variables used in the study. Table 4.11 shows the correlation coefficient matrix of both the primary and moderated variables.

Table 4.11: Pairwise Correlation matrix of the Regression Variables

Variables	TD	LTD	STD	TE	IE	EE	TANG	SZ	SG	TE*SZ	IE*SZ	EE*SZ	TD*SZ	LTD*SZ	STD*SZ	FD
TD	1.000															
LTD	-0.1759*	1.000														
STD	0.1759*	-1.0000*	1.000													
TE	-1.0000*	0.1759*	-0.1759*	1.000												
IE	-0.2645*	0.1179*	-0.1179*	0.2645*	1.000											
EE	0.2942*	-0.3191*	0.3191*	-0.2942*	-0.7484*	1.000										
TANG	-0.1977*	0.7203*	-0.7203*	0.1977*	0.1606*	-0.3865*	1.000									
SZ	0.3234*	0.085	-0.085	-0.3234*	0.1370*	-0.1999*	0.1805*	1.000								
SG	0.043	-0.003	0.003	-0.043	0.075	-0.079	-0.072	0.040	1.000							
TE*SZ	0.012	-0.2442*	0.2442*	-0.012	-0.2116*	0.2163*	-0.096	-0.045	-0.056	1.000						
IESZ	0.2078*	-0.2682*	0.2682*	-0.2078*	-0.1421*	0.3647*	-0.1550*	-0.101	-0.070	0.3075*	1.000					
EE*SZ	-0.2486*	0.002	-0.002	0.2486*	0.4261*	-0.1263*	-0.1138*	-0.1621*	0.079	-0.2737*	-0.6056*	1.000				
TD*SZ	-0.012	0.2442*	-0.2442*	0.012	0.2116*	-0.2163*	0.096	0.045	0.056	-1.000	-0.3075*	0.2737*	1.000			
LTD*SZ	0.2280*	-0.086	0.086	-0.2280*	-0.2533*	0.001	0.088	0.2541*	0.000	0.1163*	-0.062	-0.3705*	-0.1163*	1.000		
STD*SZ	-0.2280*	0.086	-0.086	0.2280*	0.2533*	-0.001	-0.088	-0.2541*	0.000	-0.1163*	0.062	0.3705*	0.1163*	-1.000	1.000	
FD	-0.8095*	0.022	-0.022	0.8095*	0.2809*	-0.2326*	-0.1524*	-0.3133*	0.093	-0.1698*	-0.2090*	0.3299*	0.1698*	-0.1948*	0.1948*	1.000

The asterisk * indicate significance at the 5% level; included observations: 367

Table 4.11 show significant correlation between financial distress (Z-score index) and total debt, total equity, internal equity, external equity, tangibility and firm size all at 0.05 significance level. The significant inverse correlation between Z-score and total debt implies that highly indebted firms are more likely to be financially distressed in comparison with the less geared firms. The situation would be contrary where a firm is mainly financed through equity. The positive significant correlation between Z-score and internal equity and the negative strong correlation between Z-score and external equity respectively signifies that internally generated sources of capital; which comprise retained earnings and reserves is less likely to drive a firm into financial distress as opposed to utilization of external equity.

On the other hand, the strong negative correlation between Z-score, tangibility and size indicate that large firms are more susceptible to financial distress than small firms. This could be attributed to the fact that large firms are prone to heavy borrowing due to the assumed higher debt capacity and hence sink into financial quagmire (Gupta *et al.*, 2014). The results also show that large firms generally prefer to borrow more and issue less equity. This is evidenced by the significant positive correlation between size and total debt variables. It can also be deduced that whenever large firms utilize equity capital, preference is given to internal equity as opposed to external equity. The results also illustrate that although highly tangible firms generally borrow less (strong negative correlation with total debt), whenever they borrow, they utilize more long term debt than short term debt. This is attributed to their assumed high collateralization in terms of fixed assets used to secure long term borrowing.

The results show perfect negative correlations between total debt and total equity as well as between long-term debt and short-term debt. This was not a surprise considering that equity and debt are the two major components of the capital structure. A similar result was revealed by correlation between long term and short term debt; which are technically substitute sources of corporate debt financing. The negative correlation between internal equity and external equity (-0.7484), though not perfect was

significantly high. The correlation coefficients for the rest of the variables, being well below 0.8 did not signify severe multicollinearity as recommended by Gujarati (2003) and Cooper and Schindler (2008).

To address the severe multicollinearity problem exhibited by the variables with significantly high correlation coefficients, the study adopted variable elimination technique where variables were dropped based on post estimation VIF values in such a manner that they did not enter the model at the same time (Kodongo, Natto, & Biekpe, 2015). For the pair of variables exhibiting perfect negative correlation, the study dropped one of the two variables that exhibited a higher VIF value.

Ordinarily, severe multicollinearity would be exhibited between the primary and their corresponding moderated variables; e.g. between total debt (TD) variable and total debt moderated by size (TD*SZ). This undesirable phenomenon makes it very difficult to distinguish the unique contributions of individual predictors on the variance of the dependent variable. High correlations among predictors also makes the standard errors of the estimated coefficients large hence compromising inferential estimation. To deal with this multicollinearity problem between primary and moderated variables, the study adopted variable centering approach in line with recommendations of Fairchild and MacKinnon (2009). The procedure involves transforming the variable by subtracting the sample mean prior to computing the product terms. As shown by pair-wise correlation results displayed in Table 4.11, variable centering technique helped to mitigate severe multicollinearity problem between the primary variables and moderated variables.

However, perfect negative correlation coefficients (-1.000) was still present between Total debt*SZ and Total equity*SZ variables as was the case between long-term debt*SZ and short-term debt*SZ variables. The study dealt with this problem by dropping Total equity*SZ and Short term debt*SZ variables from further analysis as they exhibited higher VIF values as shown in Table 4.12 and in line with recommendations of Maddala and Wu (1999).

Table 4.12: Post-estimation Variance Inflation Factor Results

Regression model 2	Model (2^a)	Model (2^b)	Model (2^c)
Variable	VIF	VIF	VIF
Short term debt*SZ	5.45E+07		
Long-term debt*SZ	5.21E+07	2.40	2.31
Total equity*SZ	2.47E+07	5.15	
Total debt*SZ	1.70E+07	5.01	1.18
Internal equity*SZ	2.55	2.53	1.83
Tangibility*SZ	2.43	2.42	2.41
External equity*SZ	2.32	2.29	2.16
Sales growth	1.03	1.03	1.03
Mean VIF	1.85E+07	2.98	1.82

4.3.4 Panel-level Heterescedasticity Test

Heteroscedasticity refers to a situation where the variance of the residual-term is not constant but varies with changes in explanatory variables (Gujarati, 2003). Although use of heteroscedastic data still provide unbiased OLS estimators, they are not efficient i.e. they do not have minimum variance in the class of all unbiased estimators. This results to smaller t-statistic value leading to inaccurate test of hypothesis. The assumption of

classical linear regression model is therefore that the error-term variance should be constant.

To test for panel level heteroscedasticity, the study adopted the Modified Wald test method. This involved first estimating the specified empirical models for fixed effects with robust-standard errors and then running the Modified Wald test against the null hypothesis of homoscedastic (constant) error variance (Torres-Reyna, 2007). The results are presented in Table 4.13.

Table 4.13: Modified Wald Test Results for Panel-level Heteroscedasticity

Fixed effects	Chi-square statistic (41)	*p*-value
Panel Model 10	24458.12	0.0000
Panel Model 11	19186.40	0.0000
Panel Model 12	7794.54	0.0000

H0: Constant error variance (homoscedasticity)

The test results for the three models provide chi-square distribution values of 24458.12, 19186.40 and 7794.54 with corresponding *p*-values of 0.0000 in each case. The results show that the chi-square statistics were all significant at 5 percent level and hence the null hypothesis of constant variance was rejected. This signified existence of panel-level heteroscedasticity in the panel data as recommended by (Wiggins & Poi, 2001). To correct this violation of classical linear regression assumptions, the study employed either the feasible generalized least squares (FGLS) estimation technique or estimated the model using robust standard errors as appropriate instead of the ordinary least squares method.

4.3.5 Serial Correlation Test

Serial correlation refers to a situation where the error terms are correlated with each other, i.e. the disturbance term of one observation is influenced by the disturbance term relating to another observation (Gujarati, 2003). The result is that the OLS estimators determined in presence of autocorrelation normally provide smaller standard errors than what is appropriate leading to misleading results of hypothesis testing. Also, the R-squared (coefficient of determination) value is deceptively large (Torres-Reyna, 2007). To detect presence of autocorrelation in panel data, the study employed the Wooldridge test for autocorrelation against the null hypothesis that there was no first order autocorrelation.

Table 4.14: Wooldridge Test Results for Serial Correlation

Model	F-test statistic (1, 38)	*p*-value
Panel Model 10	22.630	0.0000
Panel Model 11	10.899	0.0021
Panel Model 12	17.915	0.0001

H_0: No first order autocorrelation; Tests carried out at 5% significance level

As illustrated on Table 4.14, the results provided an F-test statistic with one and thirty eight degrees of freedom. The F-test statistics for models 10, 11 and 12 were 22.630, 10.899 and 17.915, respectively with corresponding *p*-values equivalent to 0.0000, 0.0021 and 0.0001 respectively. The results indicate that the F-test were statistically significant at 5 percent significance level. The finding therefore signifies a problem of first order autocorrelation in the panel data. The study dealt with this violation of

classical linear regression model assumption by either employing FGLS estimation or used robust standard errors approach depending on the nature of the estimated effects.

4.3.6 Panel Cointegration Test

According to Baltagi *et al*. (2005), panel cointegration test in empirical research provides the researcher with a mechanism to determine the long run relationship among the study variables. The test assumes that the variables are not cointegrated; meaning that all linear combinations of the dependent and explanatory variables, including the residuals from OLS, are unit root non-stationary. This was alluded to by Granger (1986) when he observed that "a test for cointegration can be thought of as a pre-test to avoid 'spurious regression' situations".

The study performed Johansen test for cointegration with a constant trend and 1 lag as chosen through lag-order selection (pre-estimation) test for VAR models. The test was carried out for both primary and moderated variables against the null hypothesis of no cointegration of variables and alternative hypothesis that the variables were cointegrated. The test results rejected the null if both trace and max statistics exceeded their corresponding critical values at 5% significance level; otherwise the null was accepted. The results of panel cointegration tests on the primary variables are presented on Table 4.15.

Table 4.15: Johansen Test for Cointegration Results

Trend:	Constant					Observations	399
Sample:	2-400					Lags	1
Maximum Rank	Parms	LL	Eigenvalue	Trace statistic	5% Critical value	Max statistic	5% Critical value
0	7	195.4845		669.58	124.24	332.452	45.28
1	20	361.7105	0.5654	337.13	94.15	117.8006	39.37
2	31	420.6109	0.2557	219.33	68.52	63.3914	33.46
3	40	452.3065	0.1469	155.94	47.21	45.8487	27.07
4	47	475.2309	0.1086	110.09	29.68	41.3762	20.97
5	52	495.919	0.0985	68.71	15.41	40.4952	14.07
6	55	516.1666	0.0965	28.22	3.76	28.2174	3.76
7	56	530.2753	0.0683				

Variables: Z-score, Total debt, Total equity, Long-term debt, Short term debt, internal equity, external equity, Tangibility, Sales growth

Null Hypothesis: No cointegration among variables

The results of Johansen test for cointegration displayed in Table 4.15 show that trace statistics exceeded the corresponding 5% critical values at all levels of variable combination under both models. This suggested that the null hypothesis of no cointegration could be rejected at all levels of variable combinations (maximum ranks) for both models. The result implied that the primary variables were cointegrated and therefore have a long-run association. Further, comparing the max statistic against the corresponding 5% critical values show that max statistic exceeded the critical values at 5% significance level for all levels of variable combinations. The result therefore led to rejection of the null hypothesis of no cointegration; effectively confirming cointegration among variables used in the models.

4.3.7 The Hausman Test for Model Effects Estimation

In order to establish which estimation effects (between fixed and random) provided superior results for the study, Hausman test was carried out for each of the specified panel regression models. The test was conducted against the null hypothesis that random effect model was the preferred model. The test results rejected the null if the chi-square statistic was significant at 5% significance level; otherwise, the null was accepted.

Table 4.16: Hausman Test Results

Model	Degrees of freedom	Chi-square statistic	*p*-value
10	6	15.30	0.1180
11	6	8.26	0.2199

H_0: Random effects model is appropriate;

Significance level: 5%

Table 4.16 display the Hausman specification test results for panel regression equations 1 and 2. The test results show that the chi-square statistics for panel equation 1 and 2 were statistically insignificant at 5% level as supported by the p-values of 0.1180 and 0.2199 respectively. The study therefore failed to reject the alternative hypothesis that the random effects estimation was appropriate for both equation 1 and 2 at 0.05 significance level. Effectively, the study estimated the panel equations for random effects.

To determine the appropriate estimation effects (between fixed effects and random effects) for the individual sectors panel regression equations, Hausman test as described above was repeated after estimating panel regression model 3 for each of the 7 sectors. The results are laid out in Table 4.17.

Table 4.17: Sector-wise Hausman Specification Test Results

Sector	Degrees of freedom	Chi-square statistic	*p*-value
Agriculture	5	0.83	0.9341
Automobiles & accessories	6	14.10	0.0286
Commercial & Services	5	0.82	0.9359
Construction & Allied	5	5.74	0.1023
Energy & Petroleum	6	27.86	0.0001
Investments	5	4.54	0.4742
Manufacturing & Allied	5	2.46	0.7819

H_0: Random effects model is appropriate; Significance level: 5%

The sector-wise Hausman test results illustrated in Table 4.17 show the chi-square statistic and corresponding *p*-values for the panel regression models under the study against the alternative hypothesis that random effects model is appropriate. Based on the tests results, the choice of the model used to estimate sector regression results is summarized in Table 4.18:

Table 4.18: Sector-wise Panel Regression Estimation Effects

Sector	Appropriate model
Agriculture	Random effects
Automobiles & accessories	Fixed effects
Commercial & Services	Random effects
Construction & Allied	Random effects
Energy & Petroleum	Fixed effects
Investments	Random effects
Manufacturing & Allied	Random effects

4.4 Panel Regression Analysis

The first stage involved regressing the panel Z-score index for financial distress against the primary capital structure variables while controlling for firm-specific variables as specified under panel model 9 and 10. To determine the moderating effect of firm size on the relationship between capital structure and financial distress, an estimation of panel model 11 was undertaken. This involved regressing Z-score index for financial distress (dependent) variable against both the primary variables and the interactive variables derived from the product terms of capital structure and firm size variables while still controlling for the sales growth. A comparative analysis of the panel model regression results was then conducted to determine the direction, magnitude and significance of moderation. Finally, panel model 12 was estimated for individual sectors

in order to establish the capital structure-financial distress relationship within each sector.

4.4.1 Effect of Capital Structure on Financial Distress

The overall objective of the study was to establish the effect of capital structure on financial distress of non-financial firms listed in NSE. To achieve this objective, the study estimated panel regression Equation 9 and 10 for random effects as supported by the Hausman test. However, to deal with panel-level heteroscedasticity and serial correlation detected in the panel data, Feasible Generalized Least Square (FGLS) estimation technique instead of Ordinary Least Square (OLS) was employed as it provided consistent estimators (Torres-Reyna, 2007). Also, in the light of perfect negative collinearity established between total debt and total equity as well as between long-term debt and short-term debt, both total equity and short-term debt variables were dropped from analysis on the basis of their comparatively high post-estimation Variance Inflation Factors (VIF). The results of panel regression analysis are laid out in Table 4.19.

Table 4.19: FGLS Random- effects Panel Regression Results

Dependent variable: Financial Distress				
Variable	Coefficient	Std. Errors	t-statistic	Prob.
Model 1[a]				
Constant	18.3581***	1.3985	13.13	0.0000
Total debt	-13.2959***	0.5543	-23.99	0.0000
Long-term debt	3.0207***	0.4148	7.28	0.0000
Internal equity	-0.5974	1.2834	-0.47	0.6420
External equity	-2.2024	1.2825	-1.72	0.0860
Tangibility	-8.3468***	0.5793	-14.41	0.0000
Model 1[b]				
Constant	17.9999***	1.3718	13.12	0.0000
Total debt	-13.4013***	0.5783	-23.18	0.0000
Long-term debt	3.1572***	0.4255	7.42	0.0000
Internal equity	-0.3179	1.2525	-0.25	0.8000
External equity	-2.0024	1.2421	-1.61	0.1070
Tangibility	-8.3377**	0.5883	-14.17	0.0000
Sales growth	0.4541**	0.2000	2.27	0.0230

Statistics	Model 1[a]	Model 1[b]	Change
R-Squared	0.7753	0.7903	0.0150
Rho	0.6357	0.6266	0.0091
Wald-statistic (6)	834.20	787.92	46.28
Prob. (Wald-statistic)	0.0000	0.0000	0.0000

The asterisk ***, **, * represent significance at 1%, 5% and 10% levels respectively.

Table 4.19 indicate the panel regression results of panel model 9 estimated with the Null hypothesis that; "There was no improvement in the relationship between the set of explanatory variables and financial distress when the control variable (sales growth) were added". Panel model 1^a show the regression results with only the capital structure variables while panel model 1^b show the results after controlling for sales growth. With an R^2 of 0.7753 in model 1a and 0.7903 in model 1^b, the analysis shows the change in R-Square statistic associated with the added variable (sales growth) is 0.0150. This reduction R^2, means that the information provided by the added control variable reduced the error in predicting financial distress by 0.0091. This meant that including the control improved in predicting financial distress and reduced the prediction error. The results further show that the F-statistic associated with inclusion of sales growth reduced by 46.28 with a probability of 0.0000. Based on these results, the null hypothesis that there was no improvement in the model by adding the control variable was rejected at 5% level.

Table 4.19 show that both the capital structure and control variable jointly explain up to 79.03% of variations in financial distress of non-financial firms listed in NSE. This is based on the resultant coefficient of determination (R^2) value equivalent to 0.7903. This indicate a relatively good measure of fit for the variables included in the model. Further, the Wald-statistic value equivalent to 787.92 together with the corresponding *p*-value of 0.0000 signify that the coefficients of the six variables are jointly statistically different from zero at 99%, 95% and 90% confidence levels.

The results further show that the intercept term, as well as the coefficients of total debt, long-term debt and tangibility are all statistically significant at 1 percent level as their corresponding *p*-values were less than 0.01 whilst sales growth is significant at 5% level. However, the coefficients of internal equity and external equity variables are insignificant at 10% level with *p*-values of 0.8000 and 0.1070 respectively. This could be attributed to the strong correlation present between the two variables as suggested by significantly high negative correlation coefficient (-0.7484) depicted in Table 4.11

(Gujarati, 2003). To deal with this problem, each highly collinear variable was dropped alternately and panel regression equation 1 estimated again. The results of the step-wise model regression estimation are illustrated in Table 4.20.

Table 4.20: FGLS Step-wise Panel Regression Results for Random Effects

Dependent Variable:	Financial Distress			
	Equation 1[a]	Equation 1[b]	Equation 1[c]	Equation 1[d]
Variable	Coefficient (prob.)	Coefficient (prob.)	Coefficient (prob.)	Coefficient (prob.)
Constant	16.0445*** (0.0000)	17.6699*** (0.0000)	19.2634*** (0.0000)	20.8331*** (0.0000)
Total debt	-13.4632 *** (0.0000)	-13.3907*** (0.0000)	-13.4632*** (0.0000)	-13.3907*** (0.0000)
Long-term debt	3.2189*** (0.0000)	3.1632*** (0.0000)		
Short-term debt			-3.2189*** (0.0000)	-3.1632*** (0.0000)
Internal equity	1.5019*** (0.0060)		1.5019*** (0.0060)	
External equity		-1.7197*** (0.0020)		-1.7197*** (0.0020)
Tangibility	-8.1899*** (0.0000)	-8.3191*** (0.0000)	-8.1899*** (0.0000)	-8.3191*** (0.0000)
Sales growth	0.4631** (0.0210)	0.4563** (0.0220)	0.4631** (0.0210)	0.4563** (0.0220)
Statistics				
R-Squared	0.7906	0.7917	0.7906	0.7917
Rho	0.6154	0.6252	0.6154	0.6252
Wald-statistic	784.52	790.54	784.52	790.54
Prob.(Wald-statistic)	0.0000	0.0000	0.0000	0.0000
Observations	367	367	367	367

The asterisk ***, **,* represent significance at 1%, 5% and 10% levels respectively

The results show that upon performing step-wise regression analysis, the coefficients of all explanatory variables except sales growth are significant at 1% level. The coefficient of sales growth is however significant at 5% level.

4.4.2 Effect of Financial Leverage on Financial Distress

The study sought to investigate the effect of financial leverage (utilization of debt and equity in the capital structure) on financial distress of non-financial firms listed in NSE. The regression results presented in Table 4.20 show that the coefficients of total debt equivalent to -13.4632 and -13.3907 are negative and statistically significant at 1% level. This finding indicate that during the period of analysis, increasing the level of debt financing in the capital structure reduced their Z-score index; meaning the firms were driven into financial distress.

The result could be attributed to the high cost of debt financing prevailing in Kenya in terms of high fixed charges (interest) applied on borrowed capital. This is further explained by the fact that majority of Kenyan firms utilize the relatively expensive commercial bank loans as their main source of borrowed capital; usually due to lack of alternative sources of debt capital (Bitok *et al*., 2011). In addition, the policy of the government to borrow domestically alongside the corporate sector increases demand for available capital and further raise the cost of leverage (Vermoesen *et al.*, 2013).

The finding of the study was in agreement with that by Gupta *et al.* (2014) whose study attributed the negative and significant association between use of debt capital and financial distress of Indian listed firms to high cost of debt capital in the Indian economy. The results further mirror the finding by Baimwera and Muriuki (2014) whose study attributed the adverse relationship between use of financial leverage and financial distress among the Kenyan listed firms to the general rise in cost of debt due to inflationary pressures emanating from negative balance of trade. However, this result were at variance from those of studies carried out by Kiogora (2000) and Abu-Rub (2012) that found debt financing to improve the firms' financial performance and hence reduce their distress level. The authors posited that the interest expense associated with use of debt; being tax-deductible results in significant tax-savings that boosts future productivity of the firm's assets.

4.4.3 Effect of Debt Maturity on Financial Distress

The study adopted long term and short term debt as proxies of debt maturity in the capital structure of non-financial firms. The regression results presented in Table 4.20 show that long term debt has coefficients of 3.2189 and 3.1632 under equations 1^a and 1^b respectively. The coefficients are positive and statistically significant at 1 percent level as signified by *p*-values of 0.0000. The results indicate that during the period of study, use of non-current debt by non-financial firms listed in NSE boosted their Altman's Z-score index of financial distress; implying a mitigation on their distress levels.

The finding is in consonance with the finding by Ogundipe *et al.* (2012) whose study of firms listed in Nigerian Stocks Exchange revealed that employment of longer-maturity debt affords excess liquidity to the firms in terms of interest-tax savings which improves their corporate financial performance. Further, the finding are in support of the study by Schiantarelli and Sembenelli (1997) that attributed the positive relationship between long-term debt funding and financial distress index among Italian and UK firms to the fact that firms normally employ long-term debt to finance capital projects that are associated with long run profitability of the firm. The finding however differed with that by Baum *et al.* (2006) who associated long term debt with low productivity for the firm consequent to the high repayment costs involved in terms of interest rates.

Table 4.20 on the other hand illustrate that short-term debt is negatively and significantly related with financial distress at 1% level. This is evidenced by the regression coefficients equivalent to -3.2189 and -3.1632 under equations 1^c and 1^d respectively. The results indicate that during the period of study, increasing the level of short term debt utilization resulted in reduction of the Z-score that signified financial distress of non-financial firms listed in NSE.

This empirical finding could be attributed to the fact that short term debt is associated with low productivity level since it is mostly procured for working (Chowdhury & Chowdhury, 2010). The working capital is normally not associated in long run profitability of the firm but for meeting recurrent expenditure. Also, use of current liabilities to finance the firm does not result in substantial interest-tax savings necessary to boost the firm's productivity. Further, current debt is associated with incidents of poor planning, misappropriation and misapplication due to its relative ease of access (Cuong, 2014).

4.3.4 Effect of Equity Structure on Financial Distress

The study used internal equity and external equity as proxies of equity structure in the capital structure of non-financial firms. The results indicate a positive and significant relationship between internal equity and the Altman's Z-score of financial distress at 1% significance level. This is evidenced by the beta coefficient of 1.5019 and a corresponding *p*-value of 0.0060 under equations 1^{a} and 1^{c}. The results signify that during the period of study, increasing the component of internal equity in the equity structure also increased the Z-score index of non-financial firms listed in NSE; implying an improvement in their financial status. However, the results depicted by panel equations 1^{b} and 1^{d} show an inverse and significant relationship between external equity and financial distress at 1% level. The results imply that during the period of analysis, increasing the employment level of external equity to finance non-financial firms resulted in financial distress.

The finding of this study mimics the pecking order hypothesis of capital structure propounded by Myers and Majluf (1984) that advocates for preference for internal equity ahead of external sources of capital. The theorists argued that employment of internal equity preserves the ownership structure and results in more profitability and growth potential of the firm. On the other hand, external equity increases the risk

exposure to present shareholders and obligates the firm to meet payments of dividends; hence affecting the firms negatively.

The results also correlate with the studies carried out by Forsaith and McMahon (2002) and Cosh and Hughes (1994) that found internal equity to be useful in improving the financial status of firms. The authors attributed this relationship to the fact that internal equity is relatively easy to procure and maintain since no issuance costs are involved. In addition, it does not oblige the firm to make dividend payments from time to time; thus enhances the firms' growth potential. On the other hand, the studies found external equity to be negatively related with corporate financial distress. The authors opined that similar to debt, external equity introduces financial risk to the firm and essentially increases the firm's beta. This causes the existing shareholders to raise their required rate of return which lowers the firm value and long run financial distress.

4.3.5 Effect of Asset Structure on Financial Distress

The study used Tangibility to proxy the asset structure of non-financial firms. The results indicate a negative and significant relationship between tangibility and the Altman's Z-score of financial distress at 1% significance level. This is evidenced by the beta coefficients of -8.1899 and -8.3191 and the corresponding *p*-values of 0.0000 under equations 1^{a} and 1^{b} respectively. The results signify that during the period of study, firms that had higher proportion of assets in fixed form (highly tangible) were characterized with low Z-score signifying they were more financially distressed.

The results of the study were in agreement with the findings of the study conducted by Campello and Giambona (2010) that found asset structure (tangibility) to be negatively associated with financial distress. The authors attributed this empirical relationship to the fact that highly tangible firms are perceived by lenders as generally illiquid; and hence difficult to reposes assets in case of default. This results in starvation from debt capital and hence low productivity. The findings also resonate with those by Maina and

Ishmail (2014) whose study attributed this observation to the fact that highly tangible firms are likely to borrow excessively resulting to hardships in servicing debt repayments. The author argued that this situation may lead to liquidity shortages that result in financial distress.

4.3.6 Effect of Firm Size on Financial Distress

A Moderator variable is the variable that potentially influences the nature of the relationship between dependent variable and independent variables in empirical research. According to Saunders *et al*. (2009), moderation refers to interaction effect, where introducing a moderating variable changes the direction or magnitude of the relationship between the dependent and independent variables. Fairchild and MacKinnon (2009) wrote that moderation could either be enhancing, buffering or antagonistic. Enhancing moderation relates to a situation where increasing the moderator also increases the primary effect of the predictor variable on the outcome variable. Buffering moderation effect is where increasing the moderator decreases the primary relationship between the explanatory variable and the explained variable. Antagonistic moderation results where increasing the moderator reverses the primary effect of the independent variable on the dependent variable.

The study tested for moderating effect of firm size on the established relationship between capital structure variables and financial distress by first estimating panel equation 1 for random effects as supported by the Hausman's test results and controlling for size effect. The study then estimated Panel equation 2 for random effects and compared the panel regression results of the two models to determine whether moderation occurred. As recommended by Fairchild and MacKinnon (2009), moderating effect is deemed significant if the coefficients of the moderated variables are statistically significant and the predictive power (R^2) of the moderated regression Equation is higher than that of the initial model.

Table 4.21: FGLS Panel Regression Results of the un-moderated model

Panel regression Equation 1:				
Dependent variable: Financial Distress				
Panel Regression Equation:				
	1[a]	1[b]	1[c]	1[d]
Variables	Coefficient (*p*-value)	Coefficient (*p*-value)	Coefficient (*p*-value)	Coefficient (*p*-value)
Constant	14.5246***	16.0803***	17.7337***	19.2413***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Total debt	-13.7106***	-13.6085***	-13.7106***	-13.6085***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Long term debt	3.2091***	3.1610***		
	(0.0000)	(0.0000)		
Short term debt			-3.2091***	-3.1610***
			(0.0000)	(0.0000)
Internal equity	1.2520**		1.2520**	
	(0.0310)		(0.0310)	
External equity		-1.4922**		-1.4922**
		(0.0100)		(0.0100)
Tangibility	-8.3446***	-8.4402***	-8.3446***	-8.4402***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Sales growth	0.4702**	0.4636**	0.4702**	0.4636**
	(0.0190)	(0.0200)	(0.0190)	(0.0200)
Size	0.1244	0.1107	0.1244	0.1107
	(0.1690)	(0.2250)	(0.1690)	(0.2250)
Statistics				
Adjusted R^2	0.7872	0.7887	0.7872	0.7887
Wald-statistic(6)	785.60	790.49	785.60	790.49
p-value (Wald)	0.0000	0.0000	0.0000	0.0000
Rho	0.6263	0.6349	0.6263	0.6349

The asterisk ***, **,* represent significance at 1%, 5% and 10% levels respectively

Table 4.22: FGLS Panel Regression Results Moderated by Firm Size

Panel regression Equation 2:				
Dependent variable: Financial Distress				
Panel Regression Equation:	2[a]	2[b]	2[c]	2[d]
Variables	Coefficient (*p*-value)	Coefficient (*p*-value)	Coefficient (*p*-value)	Coefficient (*p*-value)
Constant	16.4402***	17.3453***	19.8576***	20.8214***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Total debt	-13.9049***	-13.8689***	-13.9049***	-13.8689***
	(0.0000)	(0.000)	(0.0000)	(0.000)
Long term debt	3.4174***	3.4761***		
	(0.0000)	(0.000)		
Short term debt			-3.4174***	-3.4761***
			(0.0000)	(0.0000)
Internal equity	1.2223**		1.2223**	
	(0.0220)		(0.0220)	
External equity		-1.0234		-1.0234
		(0.0560)		(0.0560)
Tangibility	-8.9736***	-9.0744***	-8.9736***	-9.0744***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Total debt*SZ	1.4056***	1.3832***	1.4056***	1.3832***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Long term debt*SZ	0.8189***	0.9019***		
	(0.0000)	(0.0000)		
Short-term debt*SZ			-0.8189***	-0.9019***
			(0.0000)	(0.0000)
Internal equity*SZ	-0.7295***		-0.7295***	
	(0.0060)		(0.0060)	
External equity*SZ		0.9262**		0.9262**
		(0.0010)		(0.0010)
Tangibility*SZ	1.0281***	1.0021***	1.0254***	1.0039***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Sales growth	0.4539	0.4412**	0.4539**	0.4412**
	(0.0110)**	(0.0130)	(0.0110)	(0.0130)
Size	0.01690	0.0384	0.01690	0.0384
	(0.8440)	(0.6580)	(0.8440)	(0.6580)
Statistics				
Adjusted R^2	0.8038	0.8067	0.8038	0.8067
Wald-statistic(9)	1030.32	1039.11	1030.32	1039.11
p-value (Wald)	0.0000	0.0000	0.0000	0.0000
Rho	0.6766	0.6960	0.6766	0.6960

The asterisk ***, **,* represent significance at 1%, 5% and 10% levels respectively

The results presented in show a comparative analysis of the regression results of both the primary (un-moderated) model and the model upon moderation by firm size. The objective of the study was to determine whether the effect of different proxies of capital structure on financial distress changes with introduction of interaction between capital structure and firm size variables.

A comparison of panel regression results of the moderated equation against those of the model without moderation reveal that introduction of moderation result in improvement of the model's predictive power as evidenced by increase in the adjusted R^2 values. In addition, the Wald statistic for both equations is statistically significant; indicating that the variables used are jointly statistically significant. The results also indicate that firm size has a positive but insignificant effect on financial distress of non-financial firms listed in NSE during the period of study. This finding signify that although the size of the firm has no effect on their financial distress, the effect would be positive where it does. Further, the results show that the coefficients of interactive variables (product terms) in the moderated equation are all statistically significant at 1% and 5% levels. This statistical finding signify that the interaction between firm size and capital structure has significant moderation effect on financial distress of non-financial firms listed in NSE.

Specifically, the results show a positive and significant relationship between the interaction of total debt and firm size and financial distress of non-financial firms. This is a significant antagonizing moderation effect considering the main effect of financial leverage on financial distress of non-financial firms is negative and significant. The finding implies that among large-sized firms, increasing the use of leverage (total debt use) increases their Altman's Z-score of financial distress; signifying lower levels of financial distress. On the contrary, higher debt levels among smaller firms reduces their Z-score index and signify financial distress.

These results are consistent with those by Lee (2009) who concluded that larger firms enjoy economies of scale in utilization of debt capital. The author pointed that unlike smaller-sized firms, large firms have more debt capacity (in terms of assets collateral) which enable them to borrow more at lower lending rates since banks perceive them as less risky. They are therefore capable of employing large quantities of debt more productively than their smaller counterparts. Further, Amato and Burson (2007) noted that larger firms have significant proportion of deferred tax assets which they utilize by borrowing more to finance additional assets. This translate to more profitability and generally lowers their probability of experiencing financial distress.

The results show that the long term debt variable has a positive and significant coefficient at 1%, 5% and 10% levels. However, upon moderation, the magnitude of the long term debt coefficient is smaller than that obtained under the primary regression equation. The result signify a significant buffering (decreasing) effect of firm size on the relationship between long term debt and financial distress of non-financial firms. The finding signify that although use of long term debt generally lead to significant increase in financial distress index of non-financial firms listed in NSE, the level of improvement is greater among smaller firms than in large-sized firms. Concerning the effect of short-term debt, the results also indicate a buffering negative effect on financial distress of non-financial firms upon introduction of moderation between firm size and short term debt. This is evidenced by the coefficients of short-term debt*size variables of -0.8189 and -0.9019 under equations 2^c and 2^d respectively. The results imply that although increasing utilization of short-term debt result in significant increase in the level of financial distress among non-financial firms listed in NSE, the effect is less among larger firms as compared to smaller-sized firms.

The finding mirror that by Dittmar (2004) who observed that use of non-current debt among maturing firms helps them build tax-saving reserves that eventually improves their market value. The finding is also in agreement with who Serrasqueiro and Nunes (2008) noted that utilization of long term leverage is more favorable to smaller firms as

the repayment periods are more spread-out hence does not strain their liquidity situations. On the other hand Ogundipe *et al.* (2012) found the negative effect of current debt utilization to be less among the larger-sized firms since the firms are able to adequately make use of the debt and at the same time meet the tight repayment obligations tied to this leverage. By so doing, benefits of adequate working capital maintenance would counter-balance the consequences of inflexible repayment terms.

The results further indicate a negative and significant relationship between internal equity and financial distress index of non-financial firms after introducing the moderation between firm size and internal equity at 1%, 5% and 10% levels. This result signify that firm size has a significant antagonizing (reversing) moderating effect on the established positive and significant relationship between internal equity and financial distress. The finding implies that among the large-sized firms, increased use of internal equity capital increases their level of financial distress. On the contrary, employment of internal equity reduces the prevalence of financial distress among the smaller-sized firms.

The results also show that the coefficient of external equity*size is positive and statistically significant at 5% and 10% levels. The result indicate that upon introduction of interaction between external equity and firm size, the previously observed negative and statistically significant relationship is reversed. The results signify that use of external equity is significantly beneficial to large-sized corporations but is detrimental among smaller firms in as far as their financial distress level is concerned.

The finding resonate with the empirical study by Sciascia and Mazzola (2008) that found utilization of different modes of equity financing to affect corporate financial distress differently. Specifically, the authors showed that use of internal equity among small and maturing firms improved their profitability more than their larger and established counterparts. They opined that internal equity afford a cheaper and more accessible form of financing among smaller-sized firms which are not able to sustain

external capital such as debt and external equity. On the other hand, large firms have the capacity to access and maintain external capital and hence utilization of internal equity may limit their growth potential. The results are consistent with the finding by other studies such as Artikis *et al.* (2007) and Ozgulbas *et al.* (2006) who found external equity to be favorable among larger firms as compared to smaller firms (SMEs).

The results further show that the coefficient of the product term between tangibility and size is positive and significant at 1%. The result points to a significant antagonizing moderation effect considering the main effect of tangibility on financial distress of non-financial firms is negative and significant. The finding implies that among large-sized firms, increasing the proportion of fixed assets in the asset base increases their Altman's Z-score of financial distress; signifying lower levels of financial distress. On the contrary, higher asset tangibility among smaller firms drives them into financial distress.

These empirical findings suggests that firms with large asset base and higher tangibility can use excess assets as collateral to borrow and increase their productivity. The finding resonate with the studies undertaken by Akintoye (2009) and Ebel Ezeoha (2008) that concluded that high tangibility firms usually borrow more due to increased debt capacity and employ the debt for more productivity. The authors also agreed that due to their large asset base, highly tangible firms are capable of negotiating for favorable debt repayment terms which improves their financial productivity. Further, such firms enjoy a large pool of deferred tax asset base leading to lower tax expenses (Velnampy & Nimalathasan, 2010).

4.3.7 Effect of Listing Sector on Financial Distress

The study sought to establish how the sector within which individual non-financial firms are listed moderate the relationship between capital structure and financial distress. To achieve this objective, the study estimated the specified panel regression equation 3 for either random or fixed effects as supported by the Hausman specification test results

displayed in Table 4.18. Interaction variables comprised the product terms between capital structure and sector dummy variables. Sector dummies took a value of 1 if a firm is listed within the sector of interest or 0 otherwise. In accordance with the recommendation by Fairchild and MacKinnon (2009), moderation was analyzed for magnitude, direction and significance by examining the coefficients of the interactive variables.

The analysis controlled for panel-level heteroscedasticity and serial correlation by estimating the model with robust standard errors (Torres-Reyna, 2007). Further, the study conducted step-wise regression analysis to mitigate against the effects of severe multicollinearity observed between internal equity and external equity variables. This involved dropping each of the collinear variables alternately during estimation. A comparison between the regression results of the un-moderated model and sector-wise models was then undertaken to establish the effect of moderation. The results of the analysis are presented in Table 4.23.

Table 4.23: Sector-wise Panel Regression results (with robust std. errors)

Sector	Agriculture	Automobile & Accessories	Commercial & allied	Construction & allied	Energy & Petroleum	Investments	Manufacturing & allied	Overall model
Variable	Coefficient (*p*-value)	Coefficient (*p*-value)	Coefficient (*p*-value)	Coefficient (*p*-value)	Coefficient (*p*-value)	Coefficient (*p*-value)	Coefficient (*p*-value)	Coefficient (*p*-value)
Constant	15.8827*** (0.000)	16.4829*** (0.000)	14.2753*** (0.000)	16.1638*** (0.000)	12.7588*** (0.000)	9.4450*** (0.002)	13.2111*** (0.000)	16.0445*** (0.000)
Total debt	-16.3618*** (0.000)	-14.8052*** (0.000)	-10.2277*** (0.000)	-13.3909*** (0.000)	-11.7319*** (0.000)	-12.4237*** (0.000)	-9.5572*** (0.000)	-13.4632*** (0.000)
Long-term debt	1.5463 (0.2310)	6.6903*** (0.000)	3.9461*** (0.000)	4.2173*** (0.000)	8.2773*** (0.000)	-2.4583 (0.289)	3.0051*** (0.000)	3.2189*** (0.000)
Internal equity	5.6727*** (0.000)	1.6192 (0.187)	1.7841*** (0.002)	-0.1501 (0.879)	0.8846 (0.329)	12.4888*** (0.000)	2.7089 (0.150)	1.5019*** (0.006)
External equity	-5.6727*** (0.001)	-1.2329 (0.289)	-1.7841*** (0.002)	0.1501 (0.879)	-1.9878** (0.039)	-12.4888*** (0.000)	-2.7089 (0.150)	-1.7197*** (0.002)
Tangibility	-10.9148*** (0.000)	-11.5102*** (0.000)	-8.7970*** (0.000)	-6.9172*** (0.000)	-7.8439*** (0.003)	-4.8518 (0.092)	-6.6279*** (0.000)	-8.1899*** (0.000)
Sales growth	1.2850*** (0.000)	0.6457* (0.066)	0.6291*** (0.008)	0.994** (0.029)	0.391 (0.256)	-1.4378 (0.134)	0.8565 (0.210)	0.4631** (0.021)
Statistics								
R-Squared	0.7516	0.9796	0.8289	0.7430	0.8089	0.9105	0.8350	0.7906
Rho	0.4899	0.7101	0.8646	0	0.8955	0	0.8143	0.6157
Wald/F-statistic	250.01	222.81	316.87	496.77	150.77	183.06	150.81	784.52
Prob. (Wald-statistic)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

The asterisk ***, **,* represent significance at 1%, 5% and 10% levels respectively

The sector-wise regression results show that total debt has an adverse and significant relationship with financial distress in all the 7 sectors at 1%, 5% and 10% significance levels. The finding is similar with that revealed by analysis of the general regression model and implies that use of debt by non-financial firms increases their level of financial distress. The result further means that sector-specific factors provide significant moderating effect on the relationship between financial leverage and financial distress of non-financial firms listed in NSE. This finding corresponds with empirical studies by Shumi Akhtar (2005) and Amjed (2007) that showed use of debt to be negatively and significantly related to financial distress of firms regardless of the sectors of listing.

The results further show that long term debt has a positive and significant relationship with financial distress across all sectors except investments and agriculture sectors. This result is consistent with that derived from analysis of the overall model. Within the agriculture sector, the coefficient of long term debt, though positive is insignificant at 1%, 5% and 10% levels. This finding signify that during the period of analysis, use of long term debt (debt maturity) did not influence financial distress of firms listed in Agriculture sector. Nonetheless, where it did, the effect was positive. This trend could be attributed to the fact that although a significant portion of leverage among agro-based firms constitute non-current debt, the corresponding interest rates charged by financial institutions are relatively high considering the seasonal nature of their products (Antoniou *et al.*, 2006). The analysis results also show that the relationship between long term debt and financial distress among firms listed in the Investment sector is adverse but insignificant. This essentially signify that debt maturity has no effect on financial distress of investment-based firms; and where it did, the effect was unfavorable. This finding could be attributed to the finding that the capital markets in the emerging markets such as Kenya are normally characterized with volatile returns; which means that financing such trade by non-current debt that normally require lengthy repayment period may affect the firm negatively (Bitok *et al.*, 2011).

The results also show that the relationship between internal equity financing and financial distress of firms listed within agriculture, commercial and services as well as investments sectors was similar to that of the overall model (positive and significant at 1%, 5% and 10% levels). However, the coefficients of internal equity in the regression model for Automobile and accessories, Construction and allied, Energy and petroleum as well as manufacturing and allied sectors are different from that of the general model. Specifically, the results indicate that the coefficients of internal equity in Automobile and accessories, Energy and petroleum and Manufacturing sectors are positive but statistically insignificant, at 1%, 5% and 10%. This means that during the period of analysis, utilization of internal equity had no effect on financial distress of firms listed within these three sectors. However, where it did, the effect was positive. In addition, the results show that internal equity has a negative but insignificant coefficient at 1%, 5% and 10% levels for firms listed in construction sector. This implies that, use of internal equity by firms listed in this sector does not affect their financial distress. Nevertheless, the effect is negative where it does. The highlighted empirical phenomenon could be attributed to the fact that firms listed within these four sectors are ordinarily capital-intensive (Alkhatib, 2012). This means that due to the limited availability and use of internal equity financing, much of their capitation comprise of external sources such as debt and external equity.

The results show that the effect of external equity on financial distress of firms listed in Agriculture, Commercial and services, Investments and Energy sectors is negative and statistically significant at 5% and 10%. This means that sector-specific factors do not have significant moderating effect on the relationship between external equity and financial distress among firms listed in these sectors. However, it is evident that the coefficients of external equity financing in the panel regression among firms listed in Automobiles and accessories, Construction as well as Manufacturing and allied sectors is different from that of the general model. In particular, the coefficients of external equity are negative but insignificant for firms listed in Automobiles and accessories as

well as Manufacturing sectors. The results also show that external equity has a positive but insignificant relationship with financial distress of firms listed in construction sector. These empirical findings could be attributed to the fact that firms listed in these sectors employ equity capital sparingly in comparison to leverage. This marked preference for debt could be explained by ease of access for debt capital and the ability to refinance debt usually at renegotiated interest rates to finance their long term projects.

4.3.8 Effect of Sales Growth on Financial Distress

Sales growth which represented the percentage change in sales turnover over two consecutive reporting periods was used by the study to control for firm-specific characteristics. Essentially, the variable measured the rate at which year-on year sales revenue expanded/shrunk within individual firms during the period of study. The importance of the study controlling for this variable is that expansion in sales volumes does not necessarily mean that a corporation cannot experience financial distress. This could be explained by the fact that large sales require significant financing costs which may expose firms to financial distress. At the same time, a number of studies have found that firms with expanding sales are generally financially strong as compared with those experiencing dwindling sales revenue.

The results indicate that sales growth has a coefficient of 0.4631 and a corresponding p-vale equivalent to 0.0210. This output implies that sales growth has a positive and significant effect on financial distress of non-financial firms listed in NSE at 5% significance level. This means that during the analysis period, non-financial firms with increasing levels of sales revenue generally posted higher Z-score values and hence were less financially distressed. The results of the study implies that sales volume is indeed a significant determinant of financial distress among non-financial firms. The findings were in support of those carried out by (Kodongo *et al*., 2014; Maina & Ishmail, 2014) that found sales growth to be positively related with corporation's profitability.

4.3.9 Hypothesis Testing Results

Hypothesis testing is a process by which the researcher infers the result of sample data on the larger population based on a presupposition made prior to commencement of research (Gujarati, 2003). The study performed hypothesis testing by determining statistical significance of the coefficients of explanatory variables. Test-of-significance method is meant to verify the truth or falsity of a null hypothesis by using sample results, showing that the means of two normally distributed populations are equal. This was done by using the two-tailed t-test statistic and the corresponding *p*-values at 1%, 5% and 10% levels. The decision to use a two-tailed test was based on the fact that the alternative hypothesis of the study is composite rather than directional (Gujarati, 2003). This procedure was carried out against the null hypotheses enumerated in section 1.4 of chapter one. In all the tests, the decision rule was that: if the *p*-value observed is less than the set alpha (significance level), then reject the null hypothesis and if the observed *p*-value is greater than the set alpha, do not reject the null hypothesis.

a) **H_{01}: Financial leverage has no significant effect on financial distress of non-financial firms listed in NSE**

The analysis results show that financial leverage has significant negative effect on financial distress of non-financial corporations at 1% level. This is evidenced by the *p*-values corresponding to the coefficients of financial leverage variable equivalent to 0.0000. This finding led the study to reject the stated null hypothesis with 99% confidence level. By rejecting the null hypothesis, the study concluded that that financial leverage has significant effect on financial distress of non-financial companies listed in NSE.

b) H_{02}: Debt maturity has no significant effect on financial distress of non-financial firms listed in NSE

The analysis results show that debt maturity has significant effect on financial distress of non-financial corporations at 1% level. This is based on the *p*-values corresponding to the coefficients of long term debt and short term debt variables equivalent to 0.0000. This finding led the study to reject the stated null hypothesis with 99% confidence level. By rejecting the null hypothesis, the study accepted the alternative hypothesis and concluded that debt maturity has significant effect on financial distress of non-financial companies listed in NSE.

c) H_{03}: Equity structure has no significant effect on financial distress of non-financial firms listed in NSE

The analysis results show that equity structure has significant effect on financial distress of non-financial corporations at 1% significance level. This is evidenced by the *p*-values corresponding to the coefficients of internal and external equity variables of 0.0060 and 0.0020 respectively. This finding led the study to reject the stated null hypothesis with 99% confidence level. By rejecting the null hypothesis, the study accepted the alternative hypothesis and concluded that equity structure has significant effect on financial distress of non-financial companies listed in NSE.

d) H_{04}: Asset Structure has no significant effect on financial distress of non-financial firms listed in NSE

The analysis results show that asset structure has significant negative effect on financial distress of non-financial corporations at 1% level. This is evidenced by the *p*-value corresponding to the coefficient of tangibility variable equivalent to 0.0000. This finding led the study to reject the stated null hypothesis with 99% confidence level. By rejecting

the null hypothesis, the study accepted the alternative hypothesis and concluded that that asset structure has significant effect on financial distress of non-financial companies listed in NSE.

e) **H_{05}: Firm size has no significant moderating effect on the relationship between capital structure and financial distress of non-financial firms listed in NSE**

The analysis results show that firm size has significant moderating effect on the relationship between capital structure and financial distress of non-financial corporations at 5% level. This is evidenced by the *p*-values corresponding to the coefficients of the product terms between capital structure variables and size variable that were all less than 0.05. This finding led the study to reject the stated null hypothesis with 95% confidence level. By rejecting the null hypothesis, the study accepted the alternative hypothesis and concluded that firm size has a significant moderating effect on the relationship between capital structure and financial distress of non-financial companies listed in NSE.

f) **H_{06}: Listing sector has no significant moderating effect on the relationship between capital structure and financial distress of non-financial firms listed in NSE**

The analysis results show that the listing sector has significant moderating effect on the relationship between capital structure and financial distress of non-financial corporations at 5% level. This is evidenced by the *p*-values corresponding to the coefficients of the capital structure variables moderated by the sector dummy variable that were all less than 0.05. This finding led the study to reject the stated null hypothesis with 95% confidence level. By rejecting the null hypothesis, the study accepted the alternative hypothesis and concluded that the listing sector has a significant moderating

effect on the relationship between capital structure and financial distress of non-financial companies listed in NSE.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the empirical findings derived from the study, conclusions and the relevant policy recommendations. The overall objective of the study was to establish the effect of capital structure on financial distress of non-financial firms listed in NSE. Presentation of the chapter is organized around the specific objectives and hypotheses enumerated in sections 1.4 and 1.5. The conclusions are also aligned with the specific objectives with a particular focus on whether the research hypotheses were accepted or rejected by the study. The recommendations encapsulate suggestions meant to add value at both managerial and regulatory policy levels in accordance with the study findings. Finally, the chapter proposes areas for further research to address the gaps that could not be filled by the study due to time and cost constraints.

5.2 Summary of Findings

The study sought to establish the effect of capital structure on financial distress of non-financial companies listed in NSE. This involved investigating the effect of financial leverage, debt maturity, equity structure and asset structure on financial distress of the firms. In addition, the study sought to determine how firm size and listing sector moderated the relationship between capital structure and financial distress of non-financial firms. The summary and discussion followed the study hypothesis formulated in chapter one.

5.2.1 Effect of Financial Leverage on Financial Distress

The first specific objective of the study was to establish the effect of financial leverage on financial distress of non-financial firms listed in NSE. This was achieved by

analyzing how employment of debt as opposed to equity capital affected the Altman's Z-score index of financial distress. The study found that during the analysis period, financial leverage had a negative and significant effect on financial distress of listed non-financial corporations.

5.2.2 Effect of Debt Structure on Financial Distress

The study also sought to investigate the effect of debt maturity on financial distress of non-financial firms listed in Kenya. Debt maturity was operationalized by the proportion of long term and short term debt contained in the capital structure employed by non-financial firms during the study period. The analysis results showed that during the period of study, long term debt had a positive and significant effect on financial distress of non-financial firms.

5.2.3 Effect of Equity Structure on Financial Distress

The third objective of the study was to determine the effect of equity structure on financial distress of non-financial entities. The study used the proportion of internal and external equity used by the firms as proxies of equity structure. Statistical analysis results showed that internal equity had a positive and significant effect on financial distress of non-financial firms. However, external equity had a negative and significant effect of financial distress of non-financial corporations.

5.2.4 Effect of Asset Structure on Financial Distress

The fourth specific objective of the study was to establish the effect of asset structure on financial distress of non-financial firms listed in NSE. This was achieved by analyzing how tangibility of assets affected the Altman's Z-score index of financial distress. The study found that during the analysis period, asset structure had a negative and significant effect on financial distress of listed non-financial corporations.

5.2.5 Moderating Effect of Firm Size on Financial Distress

The study further sought to determine how firm size moderated the relationship established between capital structure and financial distress of non-financial firms. The effect of moderation was observed by testing the direction, magnitude and significance of the product terms between individual capital structure variables and firm size variable (natural log of total assets). The study found that the size of the firm had a significant moderating effect on the relationship between capital structure and financial distress of non-financial firms. Specifically, the study found that firm size had a significant antagonizing effect on the relationship between both financial leverage as well as and financial distress. The study also found that firm size exerted a significant buffering effect on the primary effect of debt maturity and equity structure on financial distress.

5.2.6 Moderating Effect of Listing Sector on Financial Distress

The study set out to establish the effect of the listing sector on the relationship between capital structure and financial distress of the non-financial firms. Just like in the case of firm size, moderation effect was observed by testing the direction, magnitude and significance of the product terms between individual capital structure variables and sector dummies that took a value of 1 if the firm was listed in the sector of interest and 0 otherwise. The analysis results showed that the listing sector had significant moderating effect on the relationship between all the four components of capital structure and financial distress of non-financial firms listed in NSE.

5.3 Conclusion

5.3.1 Financial Leverage and Financial Distress

First, borrowed capital (debt) is not a conducive way of financing operations of non-financial firms listed in NSE. This conclusion is based on the finding that debt financing has a negative effect on the Z-score index used to measure financial distress. This means

that employment of debt in the capital structure invariably drives non-financial companies into financial distress.

5.3.2 Debt Maturity and Financial Distress

The study further concludes that although debt financing is generally not an ideal way to finance non-financial corporations, long term debt is comparatively more palatable than short term debt. This is based on the finding that employment of long term debt reduces the incidence of financial distress on non-financial firms listed in NSE while short term debt has an opposite effect.

5.3.3 Equity Structure and Financial Distress

The study concludes that employment of internal equity that includes retained earnings and reserves reduces the incidence of financial distress among non-financial firms listed in NSE. However, use of external equity such as paid up share capital has an effect of driving non-financial companies into financial distress.

5.3.4 Asset Structure and Financial Distress

The study concludes that non-financial firms listed in NSE whose asset structure comprise of large proportion of fixed assets are comparatively more financially distressed than their less tangible counterparts. This conclusion derives from the finding that tangibility is negatively and significantly related to financial distress.

5.3.5 Moderating Effect of Firm Size on Financial Distress

The study concludes that the size of the firm plays a very important role in determining the effect of capital structure on financial distress of non-financial firms listed in NSE. Specifically, although debt financing generally results in financial distress among non-financial firms listed in NSE, use of debt capital favorable to large-sized firms than

among smaller firms. The study also concludes that the favorable effect of employment of long term debt generally reduces as the size of the firm increases.

The study concludes that while use of internal equity among large-sized firms increases their level of financial distress, employment of external equity financing among large firms generally improves lowers their financial distress levels. Concerning the effect of tangibility, the study concludes that large firms that are highly tangible are generally less distressed as compared to small but highly tangible corporations.

5.3.6 Moderating Effect of Listing Sector on Financial Distress

The study concludes that the sector within which non-financial firms are listed has a significant moderating effect on the relationship between capital structure and financial distress. This conclusion is derived for the study findings that except for the effect of financial leverage and tangibility than remained negative across all sectors, the effects of debt maturity equity structure on financial distress of non-financial firms was different across the sectors. This pattern could be attributed to differences in sectoral dynamics within which non-financial firms operate.

5.4 Recommendations

Following the findings and conclusions made by the study, several recommendations are proposed. These recommendations are made both in managerial and policy perspectives. At managerial level, the recommendations provide guidelines to managers of non-financial firms on how corporations ought to configure their capital structures so as to mitigate instances of financial distress and subsequent bankruptcy. At policy level, the recommendations are aimed at bringing to light the need to institute appropriate regulatory mechanisms meant to cushion investors from loss of their hard earned wealth and hence restore confidence in the capital markets.

First, non-financial firms should endeavor to employ more equity and less debt capital to finance their operations. This recommendation is based on the revelation that employment of borrowed capital is a major recipe for corporate financial distress.. Secondly, the study recommends that where non-financial firms must consider using debt in their capital structure, non-current debt should be prioritized ahead of short term debt. This recommendation is based on the finding that long term debt reduces the incidence of financial distress among non-financial firms. Thirdly, the study recommends that in configuring their equity structure, financing managers of non-financial firms should prioritize the use of internally generated capital such as retained earnings and reserves ahead of externally issued equity. This recommendation derives from the observation that internal equity reduces the financial distress among non-financial companies. Fourthly, the study recommends that managers of non-financial firms should maintain low proportions of fixed assets in their asset structure. This is because according to the study, highly tangible firms are generally associated with higher levels of financial distress. Fifthly, the study recommends that in choosing the mode of financing to be employed by non-financial firms, corporate managers should also consider other factors that are critical in determining the effect of capital structure on financial distress. Particularly, the size of the firm as well as sector-specific factors should be carefully considered.

At policy level, the study recommends that the government should introduce initiatives that are aimed at lowering the high interest rates associated with borrowed capital. Such initiatives that involves proper management of monetary and fiscal environment would go a long way in alleviating the high cost of capital among non-financial firms and hence mitigate the incidence of financial distress associated with debt financing. Secondly, the regulator to the capital market (CMA) should introduce policies that are aimed at encouraging non-financial firms to use internally generated capital in place of externally issued capital. Such policies could involve offering preferential tax treatment on retained capital as well as imposing higher stamp duties on externally issued capital.

By so doing, non-financial firms would be keen to employ internal capital and hence reduce their probability of financial distress.

5.5 Areas for Further Research

This study sought to provide empirical understanding on the effect of capital structure on financial distress of non-financial companies listed in Kenya. In accomplishing this, the study focused only on the firms that were listed in NSE as at 31st December 2013. However, the practice world over is to have only the best performing corporations endorsed for listing in the bourse. This tendency may result in biased research findings and conclusions concerning the topic of study. As a way of verifying the study results, a similar study could be carried out among companies which are not listed in NSE such as the SMEs.

Further, this study was undertaken within the Kenyan context and represents the background of an emerging market with unique characteristics in economic, regulatory and political fronts. In addition, the 41 non-financial firms listed in Kenya could be considered few and hence less representative in wider jurisdictions. The choice of this geographical scope was informed by time and budgetary constraints facing the researcher. The applicability of the study results may therefore be restrictive. In that regard, the study recommends a similar study be carried out within larger jurisdictions that could present unique economic and regulatory dynamics.

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APPENDICES

Appendix I: Study Population

Firm Code	Firm Name	Sector Name	Sector code
1	Kakuzi Ltd	Agriculture	1
2	Eaagads Ltd	Agriculture	1
3	Kapchorua Tea Company Ltd	Agriculture	1
4	The Limuru Tea Company Ltd	Agriculture	1
5	Rea Vipingo Plantations Ltd	Agriculture	1
6	Sasini Ltd	Agriculture	1
7	Williamson Tea Kenya Ltd	Agriculture	1
8	Car and General (K) Ltd	Automobiles & Accessories	2
9	CMC Holdings Ltd	Automobiles & Accessories	2
10	Marshals(E.A) Ltd	Automobiles & Accessories	2
11	Sameer Africa Ltd	Automobiles & Accessories	2
12	Express Kenya Ltd	Commercial & Services	3
13	Kenya airways Ltd	Commercial & Services	3
14	Longhorn Kenya Ltd	Commercial & Services	3
15	Nation Media Group Ltd	Commercial & Services	3
16	Scan group Ltd	Commercial & Services	3
17	Standard Group Ltd	Commercial & Services	3
18	TPS Eastern Africa Ltd	Commercial & Services	3
19	Uchumi Supermarket Ltd	Commercial & Services	3
20	Athi River Ltd	Construction&allied	4
21	Bamburi Cement Ltd	Construction&allied	4
22	Crown Paints Kenya Ltd	Construction&allied	4
23	E.A Cables Ltd	Construction&allied	4

24	E.A Portland Cement Company Ltd	Construction&allied	4
25	KenGen Company Ltd	Petroleum& Energy	5
26	KenolKobil Ltd	Petroleum& Energy	5
27	Kenya Power and Lightning Company Ltd	Petroleum& Energy	5
28	Total Kenya Ltd	Petroleum& Energy	5
29	Centum Investment Company Ltd	Investments	6
30	Olympia Capital Holdings Ltd	Investments	6
31	Trans-Century Ltd	Investments	6
32	Nairobi Securities Exchange	Investments	6
33	B.O.C Kenya Ltd	Manufacturing&allied	7
34	British American Tobacco Kenya Ltd	Manufacturing&allied	7
35	Carbacids Investments Ltd	Manufacturing&allied	7
36	East African Breweries Ltd	Manufacturing&allied	7
37	Eveready East Africa Ltd	Manufacturing&allied	7
38	Kenya Orchards	Manufacturing&allied	7
39	Mumias Sugar Ltd	Manufacturing&allied	7
40	Unga Group Ltd	Manufacturing&allied	7
41	Safaricom Ltd	Commercial & Services	3

Source: (NSE, 2013)

Appendix II: Secondary Data Collection Instrument

Variable	Description	Years									
		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Assets	Noncurrent assets										
	Current assets										
	Total assets										
	Cash flow from operations										
Debt	Short term debts										
	Long term debts										
	Total debt										
Equities	Book value of equity										
	Market value of equity										
Revenues	Total sales										
Earnings	EBIT										
	Net earnings										
	Retained earnings										
Price index	GNP Price level index										

Appendix III: Panel Data

YEAR	Total debt	Long term debt	Short term debt	Tangibility	Size	Sales growth	Total equity	Internal equity	External equity	Z-score	Firm code	Sector
2004	0.503	0.637	0.363	0.883	13.826		0.497	0.903	0.097	5.711	1	1
2005	0.559	0.468	0.532	0.847	13.721	-0.221	0.441	0.892	0.108	4.213	1	1
2006	0.546	0.527	0.473	0.829	13.858	0.260	0.454	0.906	0.094	5.641	1	1
2007	0.467	0.612	0.388	0.858	14.051	0.081	0.533	0.897	0.103	6.660	1	1
2008	0.411	0.627	0.373	0.835	14.265	0.067	0.589	0.886	0.114	7.620	1	1
2009	0.343	0.581	0.419	0.785	14.451	0.245	0.657	0.865	0.135	8.829	1	1
2010	0.313	0.619	0.381	0.753	14.609	0.053	0.687	0.858	0.142	9.400	1	1
2011	0.278	0.669	0.331	0.692	14.830	0.124	0.722	0.871	0.129	10.916	1	1
2012	0.216	0.810	0.190	0.654	14.846	-0.342	0.784	0.965	0.035	12.199	1	1
2013	0.219	0.819	0.181	0.685	14.882	-0.115	0.781	0.966	0.034	11.483	1	1
2004	0.173	0.877	0.123	0.736	11.909		0.827	0.918	0.082	10.861	2	1
2005	0.214	0.915	0.085	0.792	12.135	-0.285	0.786	0.931	0.069	9.732	2	1
2006	0.220	0.948	0.052	0.857	12.328	0.835	0.780	0.943	0.057	9.543	2	1
2007	0.250	0.815	0.185	0.889	12.289	-0.204	0.750	0.938	0.062	9.027	2	1
2008	0.304	0.696	0.304	0.783	12.531	0.396	0.696	0.948	0.052	9.665	2	1
2009	0.252	0.905	0.095	0.839	12.469	0.688	0.748	0.897	0.103	9.882	2	1
2010	0.304	0.696	0.304	0.783	12.531	-0.408	0.696	0.948	0.052	7.514	2	1
2011	0.250	0.835	0.165	0.755	12.780	1.591	0.750	0.925	0.075	9.658	2	1
2012	0.160	0.951	0.049	0.852	13.259	-0.149	0.840	0.958	0.042	11.124	2	1
2013	0.195	0.636	0.364	0.905	13.121	-0.567	0.805	0.900	0.100	7.158	2	1
2004	0.323	0.781	0.219	0.790	13.809		0.677	0.971	0.029	8.608	3	1
2005	0.339	0.704	0.296	0.783	13.850	0.306	0.661	0.971	0.029	8.159	3	1

2006	0.322	0.770	0.230	0.833	13.780	-0.191	0.678	0.970	0.030	7.989	3	1
2007	0.360	0.678	0.322	0.767	13.920	0.319	0.640	0.972	0.028	7.603	3	1
2008	0.367	0.674	0.326	0.788	13.797	-0.058	0.633	0.969	0.031	6.602	3	1
2009	0.410	0.568	0.432	0.702	13.971	0.292	0.590	0.972	0.028	7.723	3	1
2010	0.454	0.392	0.608	0.547	14.220	0.521	0.546	0.976	0.024	8.118	3	1
2011	0.378	0.538	0.462	0.633	14.267	0.103	0.622	0.980	0.020	9.199	3	1
2012	0.422	0.449	0.551	0.617	14.490	0.128	0.578	0.983	0.017	7.595	3	1
2013	0.382	0.510	0.490	0.604	14.547	-0.038	0.618	0.985	0.015	8.864	3	1
2004	0.331	0.716	0.284	0.414	11.137		0.669	0.739	0.261	10.857	4	1
2005	0.358	0.763	0.237	0.458	10.956	-0.339	0.642	0.674	0.326	8.222	4	1
2006	0.312	0.726	0.274	0.454	11.022	0.372	0.688	0.715	0.285	10.107	4	1
2007	0.347	0.724	0.276	0.465	10.958	0.065	0.653	0.680	0.320	9.425	4	1
2008	0.375	0.526	0.474	0.298	10.964	0.279	0.625	0.668	0.332	11.232	4	1
2009	0.340	0.406	0.594	0.225	11.348	0.311	0.660	0.571	0.429	13.001	4	1
2010	0.246	0.713	0.287	0.436	11.972	0.359	0.754	0.799	0.201	15.904	4	1
2011	0.217	0.868	0.132	0.475	12.161	-0.172	0.783	0.840	0.160	14.381	4	1
2012	0.243	0.865	0.135	0.591	12.676	0.132	0.757	0.901	0.099	14.194	4	1
2013	0.160	0.951	0.049	0.852	13.259	0.354	0.840	0.951	0.049	11.168	4	1
2004	0.440	0.446	0.554	0.615	13.844		0.560	0.479	0.521	7.361	5	1
2005	0.408	0.430	0.570	0.597	13.860	0.264	0.592	0.516	0.484	8.054	5	1
2006	0.388	0.406	0.594	0.644	13.880	0.070	0.612	0.540	0.460	7.978	5	1
2007	0.392	0.350	0.650	0.595	13.970	0.044	0.608	0.577	0.423	8.186	5	1
2008	0.464	0.267	0.733	0.508	14.305	0.100	0.536	0.657	0.343	7.568	5	1
2009	0.310	0.488	0.512	0.645	14.162	0.011	0.690	0.692	0.308	9.546	5	1
2010	0.421	0.392	0.608	0.656	14.350	0.051	0.579	0.697	0.303	7.131	5	1
2011	0.358	0.481	0.519	0.609	14.644	0.467	0.642	0.796	0.204	10.162	5	1
2012	0.275	0.606	0.394	0.630	14.681	0.216	0.725	0.826	0.174	11.368	5	1
2013	0.251	0.685	0.315	0.628	14.844	-0.001	0.749	0.857	0.143	12.017	5	1
2004	0.202	0.727	0.273	0.858	15.207		0.798	0.919	0.081	10.310	6	1

2005	0.190	0.648	0.352	0.867	15.052	-0.104	0.810	0.900	0.100	7.582	6	1
2006	0.209	0.630	0.370	0.848	15.158	0.362	0.791	0.906	0.094	8.795	6	1
2007	0.228	0.701	0.299	0.862	15.157	0.044	0.772	0.894	0.106	7.571	6	1
2008	0.306	0.826	0.174	0.857	15.732	0.098	0.694	0.926	0.074	7.764	6	1
2009	0.292	0.826	0.174	0.870	15.895	0.499	0.708	0.936	0.064	7.250	6	1
2010	0.284	0.798	0.202	0.864	16.019	0.053	0.716	0.944	0.056	7.839	6	1
2011	0.285	0.784	0.216	0.869	16.063	0.160	0.715	0.938	0.062	7.414	6	1
2012	0.280	0.765	0.235	0.876	16.004	0.043	0.720	0.944	0.056	6.699	6	1
2013	0.295	0.726	0.274	0.857	16.019	0.013	0.705	0.949	0.051	6.761	6	1
2004	0.271	0.795	0.205	0.827	14.991		0.729	0.947	0.053	9.019	7	1
2005	0.273	0.754	0.246	0.804	15.019	0.401	0.727	0.946	0.054	9.177	7	1
2006	0.265	0.749	0.251	0.834	14.965	-0.178	0.735	0.946	0.054	8.763	7	1
2007	0.290	0.701	0.299	0.794	15.139	0.225	0.710	0.949	0.051	8.892	7	1
2008	0.295	0.739	0.261	0.832	15.091	-0.017	0.705	0.951	0.049	7.991	7	1
2009	0.329	0.621	0.379	0.767	15.182	0.257	0.671	0.954	0.046	8.217	7	1
2010	0.349	0.490	0.510	0.638	15.489	0.828	0.651	0.956	0.044	9.845	7	1
2011	0.292	0.610	0.390	0.614	15.613	0.206	0.708	0.958	0.042	11.112	7	1
2012	0.317	0.557	0.443	0.662	15.796	0.098	0.683	0.958	0.042	9.349	7	1
2013	0.270	0.659	0.341	0.665	15.898	-0.032	0.730	0.960	0.040	10.430	7	1
2004	0.464	0.086	0.914	0.412	13.517		0.536	0.721	0.279	6.883	8	2
2005	0.480	0.214	0.786	0.501	13.965	0.688	0.520	0.816	0.184	7.758	8	2
2006	0.488	0.230	0.770	0.489	14.174	0.172	0.512	0.846	0.154	7.166	8	2
2007	0.566	0.164	0.836	0.377	14.530	0.484	0.434	0.869	0.131	6.956	8	2
2008	0.590	0.128	0.872	0.335	14.827	0.623	0.410	0.894	0.106	6.901	8	2
2009	0.593	0.116	0.884	0.318	14.982	0.451	0.407	0.900	0.100	6.944	8	2
2010	0.598	0.119	0.881	0.308	15.169	0.099	0.402	0.916	0.084	6.877	8	2
2011	0.655	0.147	0.853	0.373	15.532	0.274	0.345	0.883	0.117	5.836	8	2
2012	0.624	0.178	0.822	0.405	15.557	-0.062	0.376	0.897	0.103	6.099	8	2
2013	0.637	0.143	0.857	0.393	15.747	0.235	0.363	0.904	0.096	5.824	8	2

2004	0.566	0.126	0.874	0.243	15.657		0.434	0.911	0.767	7.163	9	2
2005	0.570	0.092	0.908	0.234	15.769	0.126	0.430	0.920	0.785	7.193	9	2
2006	0.547	0.096	0.904	0.225	15.871	0.081	0.453	0.931	0.798	7.618	9	2
2007	0.564	0.049	0.951	0.182	16.048	0.219	0.436	0.940	0.825	7.714	9	2
2008	0.598	0.034	0.966	0.159	16.302	0.279	0.402	0.940	0.853	7.606	9	2
2009	0.603	0.057	0.943	0.181	16.403	0.021	0.397	0.945	0.837	7.192	9	2
2010	0.628	0.046	0.954	0.167	16.501	0.085	0.372	0.947	0.849	6.858	9	2
2011	0.647	0.046	0.954	0.156	16.495	-0.072	0.353	0.943	0.846	6.314	9	2
2012	0.557	0.094	0.906	0.224	16.377	-0.006	0.443	0.949	0.780	7.509	9	2
2013	0.525	0.101	0.899	0.237	16.325	0.042	0.475	0.950	0.788	7.687	9	2
2004	0.749	0.001	0.999	0.387	13.795		0.251	0.707	0.293	3.171	10	2
2005	0.708	0.256	0.744	0.361	13.804	-0.010	0.292	0.751	0.249	4.849	10	2
2006	0.693	0.190	0.810	0.310	13.897	0.034	0.307	0.784	0.216	5.196	10	2
2007	0.726	0.321	0.679	0.418	14.032	-0.010	0.274	0.789	0.211	4.583	10	2
2008	0.801	0.464	0.536	0.445	14.006	-0.308	0.199	0.701	0.299	3.293	10	2
2009	0.667	0.345	0.655	0.613	14.176	-0.337	0.333	0.849	0.151	2.294	10	2
2010	0.882	0.426	0.574	0.748	13.934	0.182	0.118	0.457	0.543	-1.512	10	2
2011	0.626	0.001	0.999	0.830	13.890	-0.625	0.374	0.821	0.179	-1.272	10	2
2012	0.309	0.003	0.997	0.652	13.248	-0.109	0.691	0.816	0.184	5.561	10	2
2013	0.452	0.053	0.947	0.714	13.152	-0.016	0.548	0.745	0.255	2.661	10	2
2004	0.326	0.117	0.883	0.339	14.910		0.674	0.308	0.692	9.276	11	2
2005	0.367	0.124	0.876	0.303	14.980	0.027	0.633	0.314	0.686	8.736	11	2
2006	0.441	0.138	0.862	0.298	15.012	-0.056	0.559	0.248	0.752	7.334	11	2
2007	0.380	0.127	0.873	0.296	14.967	0.094	0.620	0.291	0.709	8.540	11	2
2008	0.306	0.137	0.863	0.328	14.939	-0.128	0.694	0.348	0.652	9.802	11	2
2009	0.241	0.162	0.838	0.310	14.916	0.083	0.759	0.390	0.610	11.234	11	2
2010	0.238	0.181	0.819	0.326	14.861	0.020	0.762	0.358	0.642	11.016	11	2
2011	0.280	0.138	0.862	0.271	14.955	0.099	0.720	0.381	0.619	10.665	11	2
2012	0.316	0.123	0.877	0.216	15.039	0.111	0.684	0.402	0.598	10.464	11	2

2013	0.270	0.154	0.846	0.231	15.115	-0.013	0.730	0.481	0.519	11.668	11	2
2004	0.674	0.046	0.954	0.635	13.321		0.326	0.192	0.808	2.730	12	3
2005	0.589	0.115	0.885	0.643	13.331	-0.401	0.411	0.364	0.636	3.791	12	3
2006	0.578	0.258	0.742	0.721	13.705	-0.221	0.422	0.531	0.469	4.066	12	3
2007	0.461	0.325	0.675	0.752	13.622	0.121	0.539	0.602	0.398	5.971	12	3
2008	0.673	0.427	0.573	0.860	14.094	-0.129	0.327	0.477	0.523	2.264	12	3
2009	0.684	0.437	0.563	0.882	14.081	0.112	0.316	0.545	0.455	2.666	12	3
2010	0.714	0.419	0.581	0.866	14.111	-0.076	0.286	0.571	0.429	2.536	12	3
2011	0.458	0.575	0.425	0.820	13.550	-0.454	0.542	-0.042	1.042	2.448	12	3
2012	0.600	0.457	0.543	0.871	13.114	-0.489	0.400	0.107	0.893	2.383	12	3
2013	0.587	0.428	0.572	0.785	13.083	0.685	0.413	0.108	0.892	2.783	12	3
2004	0.713	0.644	0.356	0.779	17.197		0.287	0.724	0.276	4.707	13	3
2005	0.725	0.569	0.431	0.742	17.618	0.359	0.275	0.812	0.188	4.941	13	3
2006	0.751	0.696	0.304	0.742	18.054	0.278	0.249	0.866	0.134	5.248	13	3
2007	0.720	0.738	0.262	0.737	18.163	0.113	0.280	0.893	0.107	5.541	13	3
2008	0.658	0.725	0.275	0.716	18.170	0.029	0.342	0.913	0.087	5.719	13	3
2009	0.771	0.642	0.358	0.751	18.132	0.188	0.229	0.866	0.134	4.448	13	3
2010	0.727	0.614	0.386	0.756	18.110	-0.015	0.273	0.882	0.118	4.408	13	3
2011	0.706	0.600	0.400	0.700	18.182	0.213	0.294	0.898	0.102	5.063	13	3
2012	0.703	0.563	0.437	0.718	18.165	0.257	0.297	0.897	0.103	4.541	13	3
2013	0.746	0.444	0.556	0.767	18.625	-0.084	0.254	0.759	0.241	2.283	13	3
2004											14	3
2005											14	3
2006											14	3
2007											14	3
2008											14	3
2009	0.342	0.000	1.000	0.303	12.975		0.658	0.794	0.206	9.768	14	3
2010	0.427	0.103	0.897	0.274	13.167	-0.177	0.573	0.805	0.195	8.736	14	3
2011	0.434	0.031	0.969	0.257	13.473	1.090	0.566	0.854	0.146	10.343	14	3

2012	0.600	0.000	1.000	0.329	13.403	-0.295	0.400	0.779	0.221	5.314	14	3
2013	0.437	0.000	1.000	0.293	13.437	0.332	0.563	0.848	0.152	9.432	14	3
2004	0.294	0.009	0.991	0.500	15.214		0.706	0.922	0.078	10.395	15	3
2005	0.270	0.031	0.969	0.463	15.303	0.150	0.730	0.908	0.092	11.231	15	3
2006	0.339	0.200	0.800	0.394	15.482	0.133	0.661	0.924	0.076	10.389	15	3
2007	0.367	0.124	0.876	0.387	15.590	0.212	0.633	0.928	0.072	10.276	15	3
2008	0.348	0.057	0.943	0.391	15.705	0.074	0.652	0.920	0.080	10.655	15	3
2009	0.283	0.048	0.952	0.427	15.698	-0.007	0.717	0.910	0.090	11.415	15	3
2010	0.320	0.000	1.000	0.363	15.892	0.172	0.680	0.916	0.084	10.967	15	3
2011	0.306	0.061	0.939	0.336	15.992	0.171	0.694	0.924	0.076	11.974	15	3
2012	0.314	0.041	0.959	0.321	16.184	0.098	0.686	0.936	0.064	11.644	15	3
2013	0.280	0.026	0.974	0.314	16.253	0.083	0.720	0.935	0.065	12.337	15	3
2004											16	3
2005	0.764	0.001	0.999	0.038	13.837		0.236	0.364	0.636	5.848	16	3
2006	0.620	0.000	1.000	0.038	14.029	2.494	0.380	0.637	0.363	8.310	16	3
2007	0.656	0.003	0.997	0.081	14.377	0.585	0.344	0.708	0.292	7.611	16	3
2008	0.447	0.002	0.998	0.048	15.140	0.213	0.553	0.885	0.115	9.128	16	3
2009	0.398	0.007	0.993	0.183	15.185	0.023	0.602	0.902	0.098	9.179	16	3
2010	0.553	0.043	0.957	0.111	15.896	0.920	0.447	0.845	0.155	7.671	16	3
2011	0.487	0.082	0.918	0.084	15.954	0.035	0.513	0.818	0.182	9.135	16	3
2012	0.426	0.084	0.916	0.120	15.938	0.110	0.574	0.805	0.195	9.587	16	3
2013	0.362	0.078	0.922	0.179	16.361	0.083	0.638	0.946	0.054	8.659	16	3
2004	0.703	0.194	0.806	0.446	13.791		0.297	-0.512	1.512	4.162	17	3
2005	0.631	0.139	0.861	0.430	13.797	0.127	0.369	-0.226	1.226	4.686	17	3
2006	0.560	0.240	0.760	0.391	14.071	0.492	0.440	0.126	0.874	7.040	17	3
2007	0.640	0.502	0.498	0.578	14.606	-0.120	0.360	0.235	0.765	6.160	17	3
2008	0.628	0.499	0.501	0.570	14.804	0.081	0.372	0.368	0.632	6.352	17	3
2009	0.580	0.512	0.488	0.640	14.915	-0.018	0.420	0.480	0.520	6.236	17	3
2010	0.535	0.415	0.585	0.586	15.011	0.122	0.465	0.550	0.450	6.548	17	3

2011	0.529	0.357	0.643	0.633	15.072	0.022	0.471	0.625	0.375	5.951	17	3
2012	0.475	0.327	0.673	0.644	15.069	0.140	0.525	0.657	0.343	6.554	17	3
2013	0.510	0.326	0.674	0.603	15.235	0.332	0.490	0.693	0.307	6.370	17	3
2004	0.469	0.341	0.659	0.660	14.536		0.531	0.823	0.177	6.040	18	3
2005	0.525	0.721	0.279	0.819	15.430	0.829	0.475	0.846	0.154	5.433	18	3
2006	0.445	0.760	0.240	0.839	15.630	0.067	0.555	0.962	0.038	6.041	18	3
2007	0.458	0.572	0.428	0.794	15.730	0.124	0.542	0.971	0.029	5.785	18	3
2008	0.422	0.631	0.369	0.809	15.692	-0.116	0.578	0.972	0.028	5.959	18	3
2009	0.418	0.663	0.337	0.783	15.764	0.199	0.582	0.974	0.026	6.470	18	3
2010	0.371	0.625	0.375	0.804	16.294	0.147	0.629	0.967	0.033	6.380	18	3
2011	0.387	0.682	0.318	0.816	16.391	0.225	0.613	0.970	0.030	6.393	18	3
2012	0.393	0.614	0.386	0.846	16.417	-0.022	0.607	0.975	0.025	5.979	18	3
2013	0.321	0.569	0.431	0.854	16.603	0.280	0.679	0.895	0.105	6.615	18	3
2004	0.966	0.132	0.868	0.568	14.999	-0.105	0.034	-1.728	2.728	-1.162	19	3
2005	1.601	0.261	0.739	0.702	14.433	-0.351	-0.601	1.269	-0.269	-9.848	19	3
2006	1.491	0.361	0.639	0.673	14.215	-0.313	-0.491	2.230	-1.230	-9.137	19	3
2007	1.694	0.596	0.404	0.518	14.275	0.268	-0.694	1.819	-0.819	-4.697	19	3
2008	1.616	0.448	0.552	0.448	14.304	0.508	-0.616	1.896	-0.896	-3.546	19	3
2009	1.074	0.313	0.687	0.573	14.708	0.212	-0.074	5.986	-4.986	-0.548	19	3
2010	0.512	0.198	0.802	0.622	14.964	0.161	0.488	0.415	0.585	4.073	19	3
2011	0.431	0.106	0.894	0.651	15.203	0.127	0.569	0.418	0.582	4.719	19	3
2012	0.462	0.035	0.965	0.677	15.413	0.281	0.538	0.501	0.499	3.986	19	3
2013	0.475	0.076	0.924	0.690	15.534	0.034	0.525	0.546	0.454	4.103	19	3
2004	0.487	0.337	0.663	0.663	14.522		0.513	0.502	0.498	5.450	20	4
2005	0.626	0.743	0.257	0.674	14.991	0.347	0.374	0.576	0.424	6.041	20	4
2006	0.677	0.624	0.376	0.752	15.263	0.179	0.323	0.626	0.374	4.845	20	4
2007	0.607	0.610	0.390	0.737	15.321	0.490	0.393	0.699	0.301	5.920	20	4
2008	0.665	0.564	0.436	0.703	15.664	0.190	0.335	0.767	0.233	5.547	20	4
2009	0.660	0.581	0.419	0.723	16.312	0.114	0.340	0.880	0.120	4.870	20	4

2010	0.703	0.724	0.276	0.744	16.623	0.159	0.297	0.903	0.097	5.195	20	4
2011	0.703	0.693	0.307	0.819	16.837	0.372	0.297	0.902	0.098	4.627	20	4
2012	0.736	0.672	0.328	0.706	17.110	0.394	0.264	0.915	0.085	5.139	20	4
2013	0.723	0.663	0.337	0.769	17.207	0.244	0.277	0.928	0.072	4.821	20	4
2004	0.292	0.543	0.457	0.759	16.511		0.708	0.768	0.232	8.697	21	4
2005	0.264	0.550	0.450	0.752	16.545	0.225	0.736	0.786	0.214	9.527	21	4
2006	0.258	0.485	0.515	0.696	16.734	0.112	0.742	0.816	0.184	9.890	21	4
2007	0.272	0.429	0.571	0.658	16.847	0.322	0.728	0.823	0.177	10.198	21	4
2008	0.412	0.531	0.469	0.644	17.155	0.242	0.588	0.824	0.176	8.084	21	4
2009	0.348	0.557	0.443	0.602	17.285	0.092	0.652	0.844	0.156	10.318	21	4
2010	0.351	0.361	0.639	0.614	17.321	-0.064	0.649	0.849	0.151	9.361	21	4
2011	0.278	0.454	0.546	0.601	17.327	0.278	0.722	0.836	0.164	11.111	21	4
2012	0.283	0.424	0.576	0.618	17.578	0.045	0.717	0.861	0.139	10.118	21	4
2013	0.267	0.480	0.520	0.627	17.577	-0.095	0.733	0.861	0.139	10.201	21	4
2004	0.443	0.110	0.890	0.323	13.911		0.557	0.806	0.194	8.028	22	4
2005	0.486	0.118	0.882	0.312	14.046	0.177	0.514	0.817	0.183	7.606	22	4
2006	0.498	0.153	0.847	0.326	14.244	0.171	0.502	0.846	0.154	7.499	22	4
2007	0.467	0.144	0.856	0.363	14.238	0.237	0.533	0.854	0.146	7.769	22	4
2008	0.578	0.085	0.915	0.293	14.482	0.143	0.422	0.856	0.144	6.441	22	4
2009	0.550	0.096	0.904	0.286	14.435	0.065	0.450	0.858	0.142	7.114	22	4
2010	0.542	0.073	0.927	0.250	14.495	0.206	0.458	0.869	0.131	7.399	22	4
2011	0.525	0.078	0.922	0.292	14.611	0.256	0.475	0.887	0.113	7.447	22	4
2012	0.479	0.044	0.956	0.296	14.630	0.150	0.521	0.899	0.101	8.051	22	4
2013	0.538	0.009	0.991	0.264	14.896	0.164	0.462	0.913	0.087	7.463	22	4
2004	0.356	0.118	0.882	0.166	13.107		0.644	0.681	0.319	11.985	23	4
2005	0.440	0.096	0.904	0.292	13.866	0.408	0.560	0.605	0.395	9.161	23	4
2006	0.578	0.302	0.698	0.347	14.461	0.756	0.422	0.737	0.263	7.835	23	4
2007	0.657	0.319	0.681	0.306	14.982	0.697	0.343	0.756	0.244	7.431	23	4
2008	0.551	0.291	0.709	0.352	14.929	0.135	0.449	0.766	0.234	8.540	23	4

2009	0.531	0.338	0.662	0.520	15.081	-0.284	0.469	0.836	0.164	6.933	23	4
2010	0.503	0.384	0.616	0.603	15.324	0.282	0.497	0.772	0.228	6.131	23	4
2011	0.545	0.237	0.763	0.518	15.424	0.379	0.455	0.757	0.243	6.045	23	4
2012	0.532	0.238	0.762	0.515	15.648	-0.135	0.468	0.751	0.249	6.204	23	4
2013	0.550	0.266	0.734	0.474	15.734	0.047	0.450	0.745	0.255	6.166	23	4
2004	0.759	0.810	0.190	0.676	15.826		0.241	0.750	0.250	5.180	24	4
2005	0.708	0.836	0.164	0.618	15.859	0.287	0.292	0.800	0.200	6.420	24	4
2006	0.660	0.766	0.234	0.615	16.019	0.152	0.340	0.854	0.146	6.016	24	4
2007	0.596	0.731	0.269	0.645	16.006	0.036	0.404	0.875	0.125	6.300	24	4
2008	0.556	0.767	0.233	0.707	16.021	0.125	0.444	0.888	0.112	6.601	24	4
2009	0.493	0.745	0.255	0.740	16.305	0.124	0.507	0.926	0.074	7.715	24	4
2010	0.526	0.710	0.290	0.758	16.304	0.161	0.474	0.921	0.079	5.736	24	4
2011	0.582	0.732	0.268	0.771	16.414	0.081	0.418	0.920	0.080	5.605	24	4
2012	0.671	0.744	0.256	0.824	16.453	-0.164	0.329	0.902	0.098	3.945	24	4
2013	0.561	0.633	0.367	0.777	16.596	0.083	0.439	0.937	0.063	5.156	24	4
2004	0.567	0.899	0.101	0.914	18.118		0.433	0.358	0.074	5.094	25	5
2005	0.571	0.880	0.120	0.869	18.171	0.229	0.429	0.359	0.071	5.268	25	5
2006	0.437	0.821	0.179	0.820	17.987	0.299	0.563	0.479	0.085	6.482	25	5
2007	0.378	0.811	0.189	0.903	18.434	0.018	0.622	0.574	0.054	6.037	25	5
2008	0.361	0.803	0.197	0.900	18.488	-0.206	0.639	0.588	0.051	6.216	25	5
2009	0.407	0.872	0.128	0.886	18.542	0.174	0.593	0.544	0.049	6.226	25	5
2010	0.532	0.913	0.087	0.782	18.830	-0.151	0.468	0.432	0.037	6.062	25	5
2011	0.569	0.877	0.123	0.879	18.897	0.322	0.431	0.397	0.034	5.237	25	5
2012	0.570	0.839	0.161	0.863	18.910	0.145	0.430	0.396	0.034	5.291	25	5
2013	0.607	0.846	0.154	0.867	19.056	0.016	0.393	0.364	0.029	5.096	25	5
2004	0.456	0.102	0.898	0.381	15.646		0.544	0.985	0.015	8.536	26	5
2005	0.520	0.062	0.938	0.290	15.941	0.211	0.480	0.987	0.013	8.275	26	5
2006	0.650	0.046	0.954	0.224	16.407	0.111	0.350	0.989	0.011	6.480	26	5
2007	0.624	0.071	0.929	0.248	16.401	0.113	0.376	0.990	0.010	6.713	26	5

2008	0.606	0.029	0.971	0.238	17.137	1.606	0.394	0.993	0.007	6.464	26	5
2009	0.666	0.017	0.983	0.146	17.198	-0.281	0.334	0.993	0.007	6.115	26	5
2010	0.631	0.015	0.985	0.144	17.229	0.051	0.369	0.993	0.007	6.726	26	5
2011	0.747	0.045	0.955	0.127	17.644	1.187	0.253	0.994	0.006	6.090	26	5
2012	0.803	0.034	0.966	0.249	17.302	-0.134	0.197	0.989	0.011	2.073	26	5
2013	0.763	0.033	0.967	0.311	17.152	-0.430	0.237	0.989	0.011	3.941	26	5
2004	0.458	0.423	0.577	0.700	17.290		0.542	0.910	0.090	4.530	27	5
2005	0.473	0.375	0.625	0.622	17.395	0.072	0.527	0.916	0.084	5.123	27	5
2006	0.469	0.333	0.667	0.588	17.472	0.034	0.531	0.923	0.077	5.461	27	5
2007	0.530	0.288	0.712	0.598	17.672	0.036	0.470	0.929	0.071	4.852	27	5
2008	0.601	0.485	0.515	0.653	17.907	0.026	0.399	0.934	0.066	4.706	27	5
2009	0.625	0.585	0.415	0.703	18.086	0.524	0.375	0.941	0.059	4.915	27	5
2010	0.642	0.636	0.364	0.756	18.200	0.096	0.358	0.945	0.055	4.727	27	5
2011	0.668	0.621	0.379	0.707	18.602	0.096	0.332	0.891	0.109	4.749	27	5
2012	0.676	0.654	0.346	0.790	18.714	0.027	0.324	0.888	0.112	4.395	27	5
2013	0.732	0.694	0.306	0.794	18.993	0.065	0.268	0.897	0.103	4.231	27	5
2004	0.571	0.000	1.000	0.221	16.172		0.429	0.806	0.194	6.462	28	5
2005	0.571	0.000	1.000	0.257	16.193	-0.109	0.429	0.810	0.190	6.371	28	5
2006	0.696	0.000	1.000	0.184	16.547	-0.086	0.304	0.812	0.188	5.346	28	5
2007	0.620	0.000	1.000	0.219	16.342	0.134	0.380	0.816	0.184	6.020	28	5
2008	0.655	0.000	1.000	0.190	16.492	0.282	0.345	0.826	0.174	5.956	28	5
2009	0.716	0.176	0.824	0.341	17.266	-0.267	0.284	0.467	0.533	4.626	28	5
2010	0.685	0.178	0.822	0.338	17.229	0.970	0.315	0.502	0.498	5.215	28	5
2011	0.739	0.116	0.884	0.280	17.377	0.438	0.261	0.481	0.519	4.603	28	5
2012	0.570	0.045	0.955	0.292	17.311	0.161	0.430	0.297	0.703	5.646	28	5
2013	0.615	0.045	0.955	0.249	17.504	0.319	0.385	0.351	0.649	5.658	28	5
2004	0.079	0.235	0.765	0.965	14.995		0.921	0.908	0.092	17.125	29	6
2005	0.068	0.534	0.466	0.965	15.432	-0.324	0.932	0.941	0.059	18.835	29	6
2006	0.037	0.202	0.798	0.945	15.676	0.684	0.963	0.956	0.044	31.714	29	6

2007	0.009	0.000	1.000	0.957	15.946	0.994	0.991	0.967	0.033	125.282	29	6
2008	0.008	0.000	1.000	0.962	15.913	-0.278	0.992	0.966	0.034	130.928	29	6
2009	0.039	0.000	1.000	0.983	15.698	-0.327	0.961	0.956	0.044	31.501	29	6
2010	0.048	0.000	1.000	0.939	15.926	1.651	0.952	0.965	0.035	26.532	29	6
2011	0.223	0.725	0.275	0.980	16.325	1.178	0.777	0.965	0.035	9.627	29	6
2012	0.132	0.741	0.259	0.969	16.264	-0.437	0.868	0.967	0.033	13.144	29	6
2013	0.281	0.936	0.064	0.907	16.758	2.070	0.719	0.976	0.024	9.429	29	6
2004	0.362	0.190	0.810	0.539	12.648		0.638	0.439	0.561	7.725	30	6
2005	0.368	0.142	0.858	0.589	12.577	-0.002	0.632	0.412	0.588	7.060	30	6
2006	0.750	0.179	0.821	0.408	13.588	0.362	0.250	0.403	0.597	4.018	30	6
2007	0.292	0.157	0.843	0.650	13.577	0.265	0.708	0.472	0.528	7.062	30	6
2008	0.380	0.185	0.815	0.460	13.901	1.724	0.620	0.514	0.486	6.981	30	6
2009	0.292	0.157	0.843	0.650	13.577	-0.633	0.708	0.472	0.528	7.070	30	6
2010	0.386	0.298	0.702	0.598	13.790	0.232	0.614	0.456	0.544	6.047	30	6
2011	0.397	0.237	0.763	0.647	13.887	0.078	0.603	0.453	0.547	5.595	30	6
2012	0.429	0.619	0.381	0.629	14.440	0.161	0.571	0.551	0.449	6.267	30	6
2013	0.434	0.683	0.317	0.615	14.456	0.065	0.566	0.551	0.449	6.416	30	6
2004											31	6
2005											31	6
2006											31	6
2007											31	6
2008											31	6
2009	0.597	0.608	0.392	0.577	15.983		0.403	0.712	0.288	6.599	31	6
2010	0.529	0.567	0.433	0.636	16.235	0.255	0.471	0.721	0.279	6.356	31	6
2011	0.704	0.511	0.489	0.578	16.926	0.575	0.296	0.649	0.351	5.084	31	6
2012	0.657	0.593	0.407	0.656	16.900	0.260	0.343	0.636	0.364	5.367	31	6
2013	0.661	0.625	0.375	0.632	16.987	-0.125	0.339	0.626	0.374	5.463	31	6
2004	0.547	0.000	1.000	0.340	11.424		0.453	0.527	0.473	7.843	32	6
2005	0.453	0.003	0.997	0.364	11.753	0.287	0.547	0.718	0.282	9.217	32	6

2006	0.328	0.055	0.945	0.373	12.354	1.014	0.672	0.874	0.126	13.102	32	6
2007	0.124	0.080	0.920	0.281	12.829	-0.015	0.876	0.932	0.068	18.476	32	6
2008	0.115	0.063	0.937	0.317	12.736	0.132	0.885	0.926	0.074	19.423	32	6
2009	0.126	0.019	0.981	0.345	12.621	-0.438	0.874	0.916	0.084	15.954	32	6
2010	0.146	0.000	1.000	0.680	12.907	0.729	0.854	0.935	0.065	15.030	32	6
2011	0.096	0.000	1.000	0.724	13.072	0.062	0.904	0.948	0.052	18.609	32	6
2012	0.442	0.733	0.267	0.838	13.691	0.134	0.558	0.950	0.050	7.576	32	6
2013	0.364	0.326	0.674	0.752	13.955	0.620	0.636	0.966	0.034	9.552	32	6
2004	0.213	0.147	0.853	0.458	14.198		0.787	0.915	0.085	12.257	33	7
2005	0.215	0.166	0.834	0.462	14.294	0.188	0.785	0.923	0.077	12.454	33	7
2006	0.254	0.160	0.840	0.469	14.349	0.124	0.746	0.923	0.077	11.455	33	7
2007	0.247	0.136	0.864	0.448	14.436	0.356	0.753	0.933	0.067	12.126	33	7
2008	0.293	0.093	0.907	0.447	14.537	-0.147	0.707	0.933	0.067	10.337	33	7
2009	0.243	0.192	0.808	0.532	14.443	0.001	0.757	0.931	0.069	10.937	33	7
2010	0.262	0.193	0.807	0.546	14.460	-0.101	0.738	0.931	0.069	9.763	33	7
2011	0.269	0.060	0.940	0.510	14.413	0.043	0.731	0.927	0.073	10.140	33	7
2012	0.268	0.022	0.978	0.455	14.506	0.074	0.732	0.933	0.067	10.616	33	7
2013	0.212	0.023	0.977	0.540	14.784	-0.040	0.788	0.953	0.047	10.953	33	7
2004	0.386	0.257	0.743	0.575	15.627		0.614	0.734	0.266	8.572	34	7
2005	0.377	0.281	0.719	0.592	15.648	0.188	0.623	0.743	0.257	8.981	34	7
2006	0.461	0.212	0.788	0.541	15.867	0.203	0.539	0.762	0.238	7.389	34	7
2007	0.494	0.226	0.774	0.569	16.042	0.205	0.506	0.787	0.213	6.672	34	7
2008	0.525	0.187	0.813	0.551	16.148	0.092	0.475	0.796	0.204	6.472	34	7
2009	0.557	0.211	0.789	0.597	16.171	0.079	0.443	0.786	0.214	6.038	34	7
2010	0.540	0.316	0.684	0.568	16.224	0.220	0.460	0.804	0.196	6.788	34	7
2011	0.534	0.272	0.728	0.492	16.437	0.487	0.466	0.844	0.156	7.619	34	7
2012	0.532	0.251	0.749	0.530	16.535	-0.036	0.468	0.859	0.141	7.880	34	7
2013	0.554	0.280	0.720	0.499	16.648	0.011	0.446	0.868	0.132	8.024	34	7
2004	0.199	0.812	0.188	0.723	13.754		0.801	0.925	0.075	11.069	35	7

2005	0.181	0.791	0.209	0.617	13.811	0.275	0.819	0.931	0.069	12.903	35	7
2006	0.162	0.811	0.189	0.552	13.842	0.174	0.838	0.934	0.066	14.193	35	7
2007	0.154	0.762	0.238	0.526	13.904	0.159	0.846	0.939	0.061	14.994	35	7
2008	0.153	0.793	0.207	0.549	14.006	0.047	0.847	0.945	0.055	13.883	35	7
2009	0.152	0.681	0.319	0.486	14.135	0.428	0.848	0.951	0.049	15.990	35	7
2010	0.144	0.695	0.305	0.745	14.229	0.122	0.856	0.869	0.131	14.729	35	7
2011	0.157	0.832	0.168	0.768	14.369	-0.071	0.843	0.884	0.116	13.650	35	7
2012	0.179	0.583	0.417	0.682	14.515	0.600	0.821	0.897	0.103	13.469	35	7
2013	0.127	0.684	0.316	0.595	14.606	0.034	0.873	0.912	0.088	17.079	35	7
2004	0.265	0.291	0.709	0.471	16.849		0.735	0.816	0.184	11.629	36	7
2005	0.252	0.295	0.705	0.442	16.940	0.156	0.748	0.825	0.175	12.519	36	7
2006	0.250	0.308	0.692	0.440	17.026	0.090	0.750	0.838	0.162	12.452	36	7
2007	0.330	0.200	0.800	0.418	17.253	0.307	0.670	0.839	0.161	10.744	36	7
2008	0.335	0.204	0.796	0.473	17.320	0.189	0.665	0.832	0.168	10.564	36	7
2009	0.348	0.243	0.757	0.471	17.394	0.059	0.652	0.815	0.185	10.239	36	7
2010	0.377	0.192	0.808	0.548	17.464	0.124	0.623	0.803	0.197	9.102	36	7
2011	0.459	0.320	0.680	0.721	17.722	0.161	0.541	0.733	0.267	6.696	36	7
2012	0.840	0.510	0.490	0.669	17.815	0.237	0.160	0.564	0.436	6.545	36	7
2013	0.856	0.469	0.531	0.682	17.885	0.064	0.144	0.678	0.322	5.427	36	7
2004											37	7
2005	0.661	0.185	0.815	0.171	13.615		0.339	0.242	0.758	8.257	37	7
2006	0.518	0.174	0.826	0.191	13.731	-0.096	0.482	0.526	0.474	8.945	37	7
2007	0.627	0.136	0.864	0.155	13.989	0.100	0.373	0.526	0.474	7.306	37	7
2008	0.562	0.184	0.816	0.238	13.638	-0.205	0.438	0.427	0.573	7.268	37	7
2009	0.604	0.124	0.876	0.203	13.813	-0.073	0.396	0.468	0.532	6.757	37	7
2010	0.655	0.127	0.873	0.193	13.972	-0.006	0.345	0.479	0.521	6.299	37	7
2011	0.725	0.107	0.893	0.278	13.832	-0.159	0.275	0.248	0.752	4.067	37	7
2012	0.696	0.132	0.868	0.239	13.956	0.000	0.304	0.399	0.601	5.529	37	7
2013	0.580	0.187	0.813	0.274	13.756	0.039	0.420	0.470	0.530	7.050	37	7

2004	0.409	0.513	0.487	0.606	16.029		0.591	0.811	0.189	7.834	39	7
2005	0.360	0.529	0.471	0.616	16.067	0.029	0.640	0.832	0.168	9.126	39	7
2006	0.351	0.518	0.482	0.626	16.290	0.156	0.649	0.868	0.132	8.958	39	7
2007	0.300	0.549	0.451	0.689	16.293	-0.109	0.700	0.878	0.122	9.344	39	7
2008	0.361	0.335	0.665	0.676	16.465	0.153	0.639	0.662	0.338	7.414	39	7
2009	0.426	0.494	0.506	0.707	16.676	-0.015	0.574	0.695	0.305	6.694	39	7
2010	0.406	0.557	0.443	0.641	16.710	0.324	0.594	0.722	0.278	8.104	39	7
2011	0.379	0.660	0.340	0.716	16.948	0.011	0.621	0.789	0.211	7.993	39	7
2012	0.431	0.515	0.485	0.738	17.126	-0.016	0.569	0.804	0.196	6.547	39	7
2013	0.509	0.395	0.605	0.742	17.122	-0.231	0.491	0.771	0.229	4.419	39	7
2004	0.530	0.939	0.061	0.501	15.263		0.470	0.509	0.491	7.567	40	7
2005	0.451	0.947	0.053	0.503	15.169	0.199	0.549	0.514	0.486	8.413	40	7
2006	0.388	0.936	0.064	0.488	15.094	-0.033	0.612	0.516	0.484	9.014	40	7
2007	0.376	0.964	0.036	0.432	15.129	0.051	0.624	0.524	0.476	9.591	40	7
2008	0.378	0.856	0.144	0.383	15.376	0.231	0.622	0.584	0.416	10.222	40	7
2009	0.435	0.138	0.862	0.311	15.532	0.232	0.565	0.568	0.432	7.604	40	7
2010	0.336	0.209	0.791	0.325	15.438	-0.010	0.664	0.571	0.429	9.208	40	7
2011	0.344	0.176	0.824	0.284	15.558	0.147	0.656	0.575	0.425	9.636	40	7
2012	0.380	0.191	0.809	0.274	15.672	0.209	0.620	0.575	0.425	9.043	40	7
2013	0.471	0.170	0.830	0.280	15.908	-0.052	0.529	0.569	0.431	7.561	40	7
2004											41	3
2005											41	3
2006	0.459	0.458	0.542	0.829	17.598		0.541	1.000	0.000	7.188	41	3
2007	0.419	0.442	0.558	0.820	17.848	0.357	0.581	1.000	0.000	7.915	41	3
2008	0.427	0.204	0.796	0.827	18.125	0.293	0.573	0.953	0.047	7.040	41	3
2009	0.442	0.118	0.882	0.809	18.334	0.148	0.558	0.963	0.037	6.008	41	3
2010	0.402	0.191	0.809	0.783	18.461	0.191	0.598	0.972	0.028	7.203	41	3
2011	0.408	0.265	0.735	0.809	18.550	0.129	0.592	0.976	0.024	6.861	41	3
2012	0.409	0.245	0.755	0.826	18.619	0.128	0.591	0.979	0.021	6.599	41	3

2013	0.377	0.247	0.753	0.803	18.674	0.162	0.623	0.975	0.025	7.445	41	3

Firm code and sector denotes the identity of non-financial firm and sector of listing as specified in Appendix 1

Appendix IV: Altman's Z-Score Model For The Emerging Markets

$$Z - score = 3.25 + 6.56x_1 + 3.26x_2 + 6.72x_3 + 1.05x_4$$

Where:

Z-Score = Financial distress index (emerging market score),

X_1 = Net working capital/Total assets,

X_2= Retained earnings/Total assets,

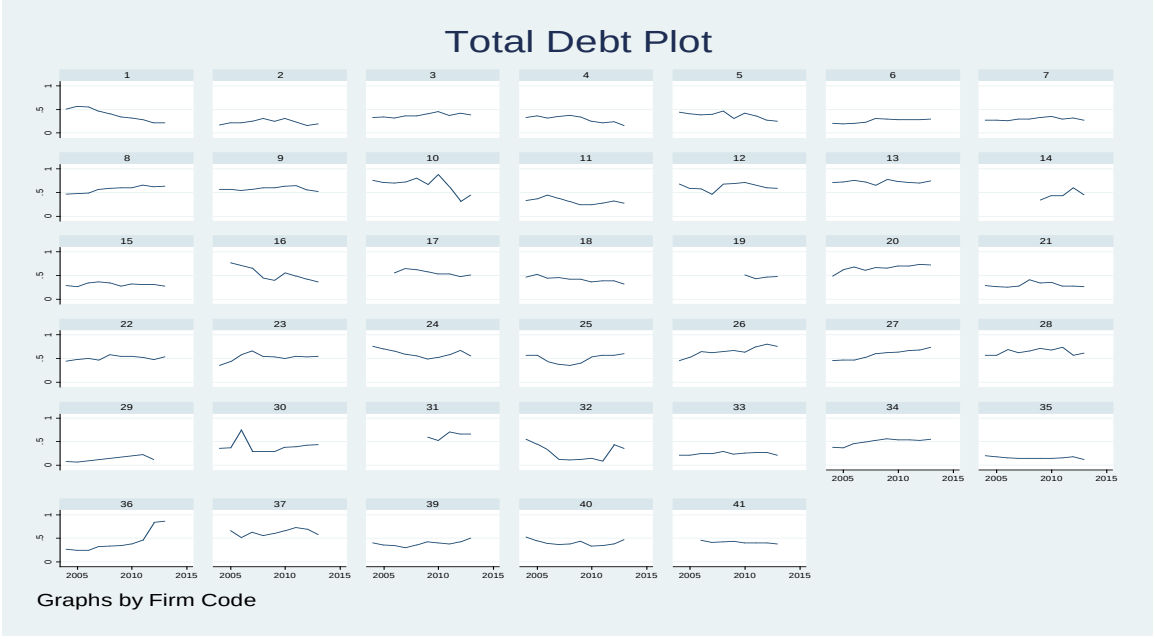
X_3 = Earnings before Interest and Taxes/Total Assets,

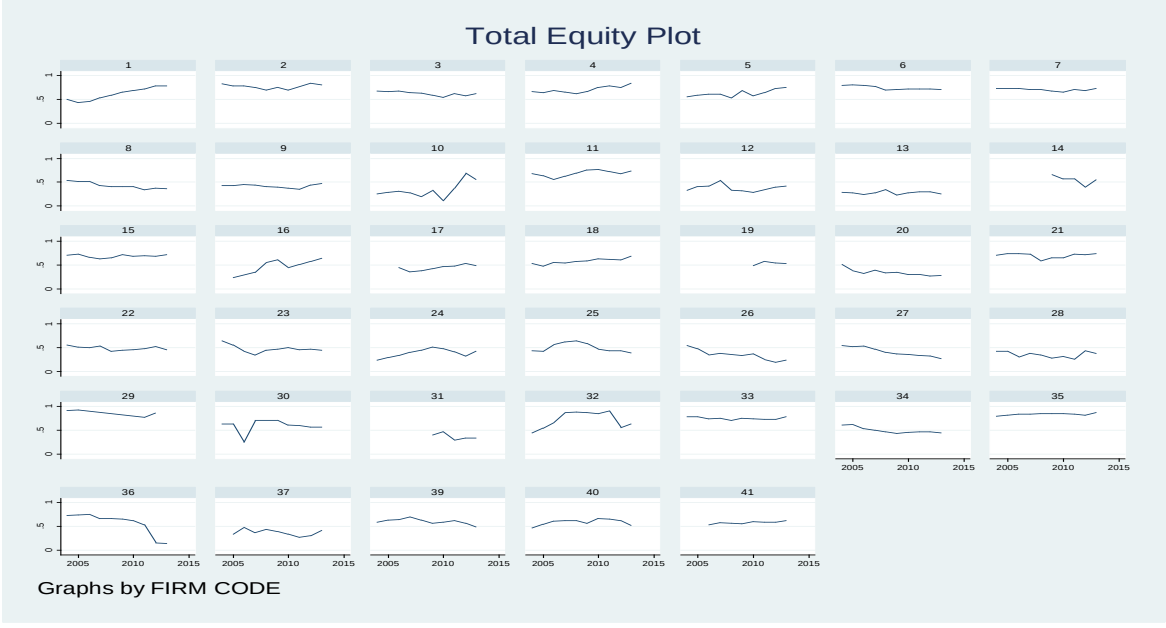
X_4= Book value of equity/Book value of total liabilities

Zones of discrimination: Z > 5.85: Safe zone, 4.15 <Z <5.85: Grey zone, Z <4.15: Distress zone.

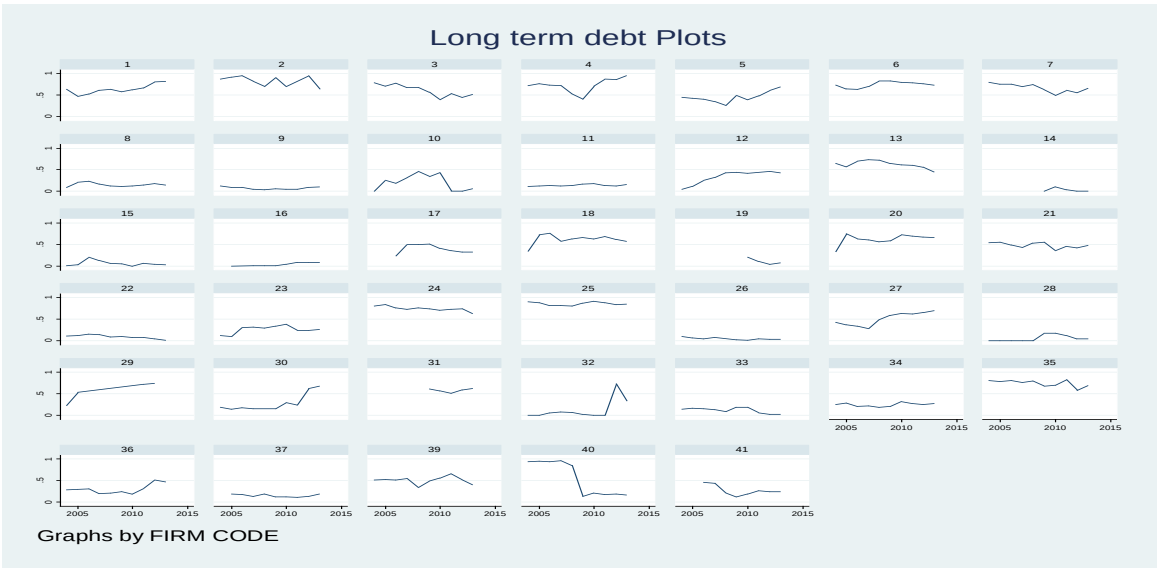
Source: Begley, J. and Ming, J. (2007)

Appendix V (A): Variables Data Plots By Firm

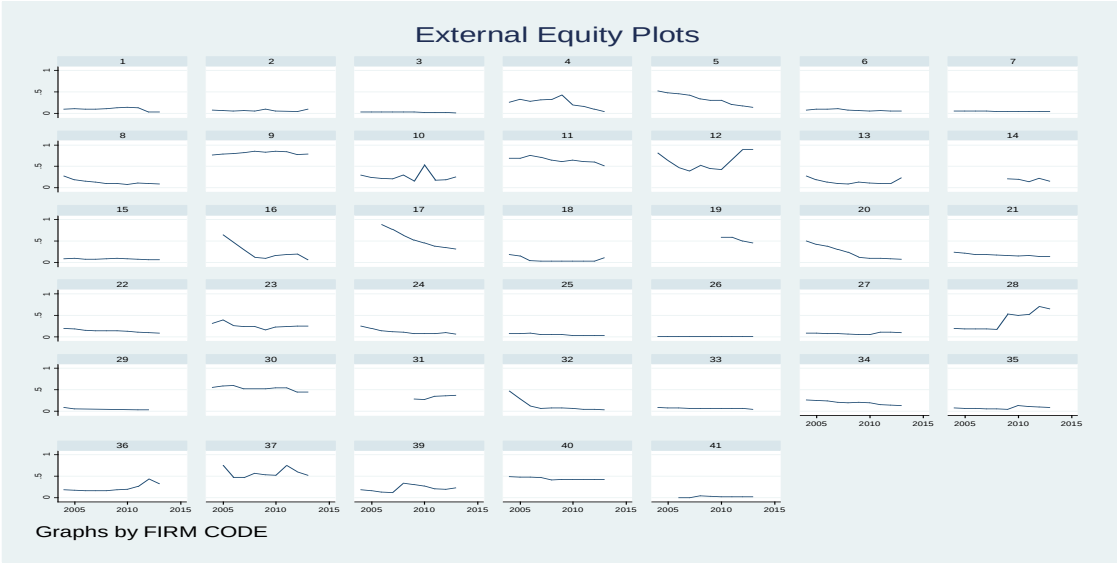




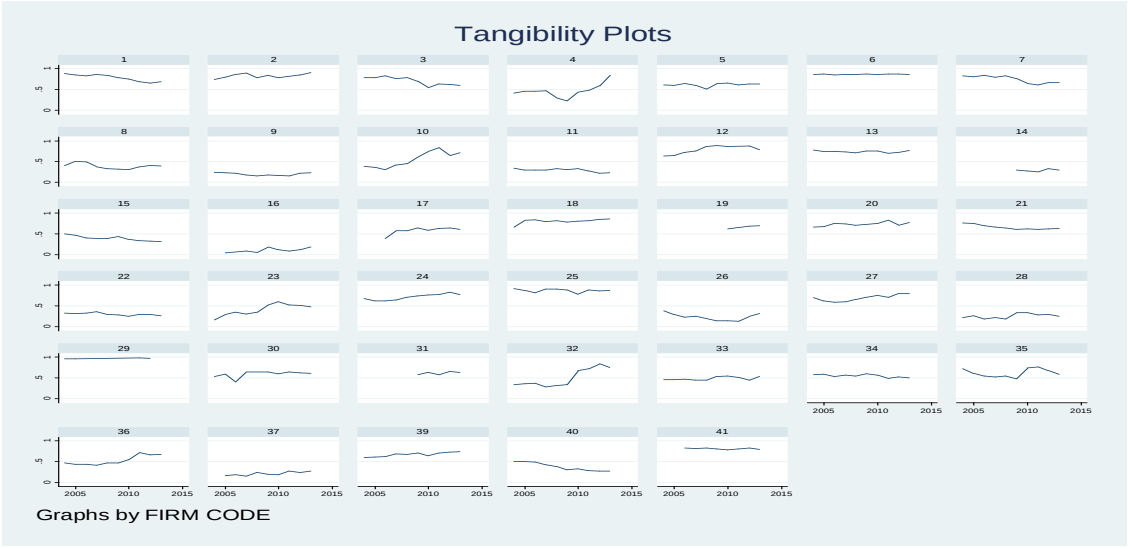
Appendix V (B): Variables Data Plots By Firm



Appendix V (C): Variables Data Plots By Firm



Appendix V (D): Variables Data Plots By Firm




Sales Growth Plots
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.5
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2005
2010
2015
Graphs by FIRM CODE