

## **Relationship between Debt Financing and Financial Soundness of Non-Financial Companies Listed in Nairobi Securities Exchange, Kenya**

**Robert Gitau Muigai (Corresponding Author),**  
PhD (Finance) Candidate,  
Jomo Kenyatta University of Agriculture and Technology, Kenya  
E-Mail address: gitauwamuigai@yahoo.com

### **Co-authors**

**Dr. Stella Muhanji,**  
Senior Lecturer,  
Kabarak University, Kenya

**Dr. Tabitha Nasieku,**  
Lecturer,  
Jomo Kenyatta University of Agriculture and Technology, Kenya

---

### **Abstract**

*Since independence, Kenya has witnessed many cases of corporate failure among listed companies. In addition, instances of operational but financially struggling corporations have been numerous. This has not only resulted to erosion of confidence in the capital market but has also led to loss of investors' wealth. Although subsequent investigative reports conducted by government agencies have attributed this phenomenon to aggressive financing by the firms that take up excessive debt to finance their assets, analysts and members of public alike have discredited these explanations on grounds of political expediency and lack of scholarly underpinning. This study therefore investigated the effects of debt financing on financial soundness of non-financial companies listed in the Nairobi Securities Exchange (NSE), Kenya. The study employed quantitative research design. A census of the 40 non-financial companies listed as at 31<sup>st</sup> December 2013 was taken. The study used secondary panel data extracted from the published annual reports and financial statements of listed non-financial companies for the 10 years period from 2004 to 2013. The study estimated the specified the panel regression model for random effects as supported by the Hausman test results. Feasible Generalized Least Square (FGLS) regression results revealed that total debt is negatively and significantly related with financial soundness of non-financial firms listed in NSE. Further, long term debt had a positive and significant relationship with financial soundness. The study also found that short term debt*

*was negatively and significantly related with financial soundness of non-financial firms. On the basis of these empirical findings, the study recommended that managers of listed non-financial companies should use debt financing sparingly in an effort to promote the level of financial soundness. Where debt financing must be utilized, long term debt should be employed as it increases the financial soundness of non-financial firms listed in NSE.*

---

***Key words: Corporate failure, Debt financing, financial soundness, Long term debt, Non-financial Companies***

## **1.0 Introduction**

Corporate financial soundness has been defined as the state of the firm being out of risk of failure (Damijan, 2014). According to Hillegeist, Keating, Cram, and Lundstedt (2004), financial failure may arise from lack of liquidity, capital inadequacy, poor management or volatile profitability. The implication of this definition is that that financially sound firms are generally solvent and able to meet financial obligations as they fall due. Sundararajan et al. (2002) Stated that financial soundness provides information on the overall financial health of a firm and is a good indicator of firm quality. In contrast to corporate financial performance which considers specific aspects of the firm's operation such as year-on-year profitability, analysis of financial soundness takes a holistic and comprehensive approach in assessing the viability of the firm (Moorhouse, 2004).

Managers, stockholders, lenders and employees are concerned about the financial soundness of their firm. To the managers, their job security as well as personal reputation are in jeopardy should the firm fail. To employees, their basic livelihood and survival is threatened when the firm (employer) struggles financially. In addition, when the firm cannot meet financial obligations, both the shareholders' equity position as well as the creditors' claims are not guaranteed. The government also is interested in the stability of the firms as failure impacts negatively on the entire economic development agenda. This comes in terms of dwindling tax earnings and erosion of investors' confidence (Ming, 2000). This shared interest among the stakeholders creates the need to provide answers to the question concerning the causes of firm failure (Brennan & Schwartz, 1984)

Over the past two decades, the world has with devastating effects witnessed numerous cases of failure among globally reputed firms. These corporations that include: General Motors (2009), Swissair (2001), The CIT Group (2009), Consec (2002), Pacific Gas & Electric Ltd (2001), Delta Air lines (2005), Parmalat (2003), Enron (2001) and WorldCom (2002) had been considered the icons of corporate financial stability prior to filing for bankruptcy. Their collapse therefore came with tremendous surprise to analysts and industry practitioners alike. Kenya has also experienced many instances of corporate bankruptcy among listed companies since independence. This has resulted to firms being put under receivership, undertaking financial restructuring or even being delisted from the NSE. Although the banking sector has registered

majority of these cases, mainly attributable to the banking crises, non-financial companies such as: Uchumi Super Markets (2006), KPCU (2009), East African Packaging (2003), Dunlop Kenya, Regent Undervalued Assets Ltd (2001), Lonhro EA Ltd (2001), Theta Group (2001) (CMA statistical bulletins, 2003 – 2009) have also collapsed over the past five decades (Kalani & Waweru, 2007). The result has not only been loss of investors' wealth but also erosion of confidence in the stock market. This undesirable phenomenon has motivated finance scholars to undertake research aimed at examining the underlying causes of firm failure.

Among the identified causes, financing factor has been cited as a key determinant of financial soundness among the firms (Memba & Nyanumba, 2013). According to Rajan and Zingales (1995), the firm's financing structure is tightly related to its ability to fulfil the needs of various stakeholders and plays a critical role in determining the stability of the firm. In that regard, the author noted that finance managers should endeavor to strike a balance between financing requirements and corporate sustainability. However, empirical research over the years has provided mixed results on the relationship between debt financing and corporate financial soundness. It is against this background that this study was carried out.

### **1.1 Statement of the Problem**

Since independence, the government and the private sector have invested heavily in creating a conducive environment to do business in Kenya. While some companies have indeed performed exceedingly well, others have struggled financially. This has culminated in firms being put under receivership, undertaking financial restructuring and some have even been delisted from the NSE. Efforts to revive the ailing firms have often not been successful and have ended up in liquidation. This has not only led to loss of shareholders' wealth but has also eroded confidence in the capital markets. Subsequent investigative reports commissioned by the government on causes of corporate insolvency have largely attributed this phenomenon to aggressive financing by firms in terms of utilizing excessive debt to finance their assets. These reports have nonetheless been discredited on grounds of political expediency and lack of scholarly underpinning (Mwega, 2011). However, available research studies on contribution of debt financing to corporate failure have provided conflicting empirical results. Specifically, while studies by Gupta, Srivastava, and Sharma (2014) and Mwangi, Muathe, and Kosimbei (2014) have shown debt financing to be negatively related to corporate financial soundness, research by Akhtar, Javed, Maryam, and Sadia (2012) and Velnampy (2013) has postulated a positive relationship between debt financing and financial soundness of the firms. Intriguingly, studies by El-Sayed Ebaid (2009) and Pratheepkanth (2011) have revealed that debt financing has no effect on the firms' financial soundness. This lack of empirical convergence has motivated the researcher to carry out this study that is aimed at investigating how debt financing affect financial soundness of non-financial firms listed in NSE, Kenya.

## 1.2 Research Objectives

The overall objective of the study is to establish the effect of debt financing on financial soundness of non-financial firms listed in NSE. The study was guided by the following specific objectives:

- i. To establish how Financial leverage influences the financial soundness of non-financial firms listed in NSE.
- ii. To find out the effect debt maturity on the financial soundness of non-financial firms listed in NSE.

## 1.3 Research Hypotheses

Based on the identified objectives, the study tested the following hypotheses:

- i. H<sub>0</sub>1: Financial leverage does not significantly contribute to financial soundness of non-financial firms listed in NSE
- ii. H<sub>0</sub>2: Debt maturity has no significant effect on financial soundness of non-financial firms listed in NSE

## 2.0 Literature review

This section presents a review of both theoretical and empirical literature that postulate the relationship between debt financing and financial soundness of corporations.

### 2.1 Theoretical Review

The theoretical framework of capital structure and its effect to the firm was pioneered by Breavely and Myers, (1956) under the traditional view hypothesis. The theorist argued that increasing debt financing in the firm had an initial effect of boosting the firm value through tax savings associated to borrowing. However, continued use of debt beyond a certain threshold more- than offsets the accrued benefits of debt as the cost of equity increases. Through their seminal work, Modigliani and Miller (1958) however challenged the traditional view and came up with the capital structure irrelevance hypothesis. The theory argued 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 do), capital structure has no effect on the firm value. They argued that it is the combination of business risk (cost of capital) and earnings capacity (Return on assets) but not the mix of debt and equity that determine the financial soundness of firms. However, this initial work by Modigliani and Miller was heavily faulted on the basis of perfect market condition assumptions. The critics opined that taxes existed in reality, transaction costs were present and firms operated in diverse risk environment. In response, Modigliani and Miller (1963) reviewed their work and developed the capital structure relevance hypothesis. By incorporating the effects of corporate taxes and relaxing the assumption of existence of arbitrage, the theory which is regarded as the pioneer trade-off hypothesis argued that debt interest; being tax deductible provides extra cash flows to the firm in form of interest tax shield and increases their value. They therefore concluded that in conditions of permanent

debt, constant cost of debt and static marginal tax rate, leveraged firms would be more financially sound than the unlevered firms. This is attributed to the present value of interest tax shield associated with debt financing. This theoretical orientation was further modified by Myers (1977) who developed the static-trade-off theory of capital structure. The theorist argued that although debt financing benefits the firm through tax-shield cash flows, continued use of debt invariably increases the financial risk which is associated with the possibility of defaulting on debt repayment. This demotivates equity-holders who demand higher rate of return in terms of dividends pay-out ratios as a compensation for bearing more risk. In addition, debt holders are less enthusiastic to continue providing more capital and also demand high rates on existing debt; which further increases the rate of cash outflow to the firm. Similar to the traditional view hypothesis, 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.

Other theories that relate capital structure to financial soundness of the firm exists. Such theories includes the Agency costs hypothesis that is tightly related to the principal-agency relationship(Jensen & Meckling, 1976), the pecking order theory attributed to Myers and Majluf (1984) and provides for hierarchical preference for different sources of financing with regard to internal and external sources of capital. However, it is noteworthy that in the words of Myers (2001), there is no universal theory of capital structure exists and no reason exists to expect one.

## 2.2 Empirical Literature

This section reviews the findings by different scholars on the relationship between use of debt and corporate financial soundness. In a study aimed at investigating the impact of debt financing on financial soundness 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 (TDTA) and total debt to total equity (TDTQ) were used as proxies of debt financing while return on equity (ROE), represented financial soundness. The results showed that debt financing had a positive and significant effect on firm soundness. This finding was similar to that by Nerlove (1968) and Baker (1973) who found a positive relationship between use of debt and financial soundness of firms listed in Bangladesh and Turkey respectively.

Ebaid (2009) carried out a study to investigate the impact of borrowed capital on financial soundness of Egyptian firms. Financial soundness was measured using profitability variables such as ROE, return on assets (ROA), and gross profit margin) while the extent of borrowing was measured by total debt to total assets ratio. The study found that debt had negative but insignificant impact on corporate financial soundness. The finding agreed with that by Pratheepkanth (2011) whose study of 210 Sri-Lankan firms listed in the Colombo stock exchange found that the firms exhibited weakly negative relationship between debt financing and financial soundness as measured through profit growth. These results were however inconsistent with empirical studies by Hadlock and James (2002) and Ghosh, Nag, and Sirmans (2000) both of which postulated a positive relationship between total debt and financial soundness of firms.

Gupta et al. (2014) investigated the effect of financial leverage on financial soundness of the 100 Indian firms listed in the Indian National Stocks Exchange over the 5 years period (2006 –

2010). Both the market and book values of debt and equity were adopted as proxies of leverage, while financial soundness was measured by ROA. The author observed that financial soundness was significantly negatively related with debt financing but significantly positively correlated with equity capital. The implication of the finding was that the highly geared companies exhibited declining levels of financial soundness while firms with high levels of equity showed increased financial soundness. This finding resonated with that by Krishnan and Moyer (1997) who showed a negative and significant impact of total debt on return on equity (ROE) among the studied 81 Asian corporations. However, the results differed with that by Akhtar et al. (2012) whose similar study on firms in the energy and fuel sectors listed in Karachi Stocks Exchange, Pakistan showed a positive and significant relationship between financial leverage and profitability (ROA), sales growth and firm size.

Closer home, Mwangi et al. (2014) undertook a study aimed at investigating the relationship between debt financing and financial soundness of non-financial firms quoted at the Nairobi Securities Exchange (NSE) over the five years period 2006 – 2012. Gearing level was measured by total debt to total equity ratio while financial soundness was observed by means of both ROA and ROE. The study found a statistically significant negative association between total debt and measures of financial soundness. The implication of the finding was that increasing the use of debt invariably diminished the firms' profitability levels. This finding was in agreement with that by Maina and Ishmail (2014) whose similar study showed a negative and significant relationship between debt and financial soundness among the Kenyan non-financial listed firms. The findings however differed with that by Kiogora (2000) whose study postulated a positive relationship between financial leverage and financial soundness of the Kenyan listed firms.

In the words of Baum, Schafer, and Talavera (2006), debt maturity encapsulates the duration between procurement and repayment of debt. Depending on the period that debt remains outstanding, borrowed capital can be categorized as either short term (repayable within 12 months after the reporting date) and long term (repayable after 12 months of reporting date) (Pandey, 2009).

Empirical studies have demonstrated that both short term and long term debt influences the corporate financial soundness differently. In a seminal paper, Myers (1977) argued that firms that employed shorter-maturity debt are likely to experience 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 was supported by Aivazian, Ge, and Qiu (2005) whose study showed a significant negative relationship between long term debt-to-total debt ratio and investments (the ratio 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 financial soundness 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. This finding is however diametrically opposed to 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 financial performance 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 financial soundness 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 financial soundness was represented by earnings per share (EPS) and price-earnings (P/E) ratio. The study used correlation and regression analysis to test for the significance of debt structure on financial soundness. 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 31<sup>st</sup> December 2007 revealed a positive and statistically significant association between long-term debt and financial soundness of Nigerian listed firms.

Ogundipe, Idowu, and Ogundipe (2012) undertook a study to assess the empirical effect of debt structure on financial soundness 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 financial soundness was measured by the ratio of cash flow from operations to total assets and the working capital ratio (liquidity). 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.

### **2.3 Comments on Literature Review**

As can be noted, the results of empirical literature on the relationship between debt financing and financial soundness are contradictory which justifies further research. Also, different proxies of measuring financial soundness have been adopted by different researchers. The most popular measures include: profitability, liquidity and investment growth. This study differs from previous studies by adopting the Altman's Z-score index of financial distress (modified for emerging markets) as a measure of financial soundness. Being a weighted measure of the individual

indicators of financial performance, this measure provides a comprehensive appraisal of corporate financial soundness.

## 2.4 Conceptual Framework

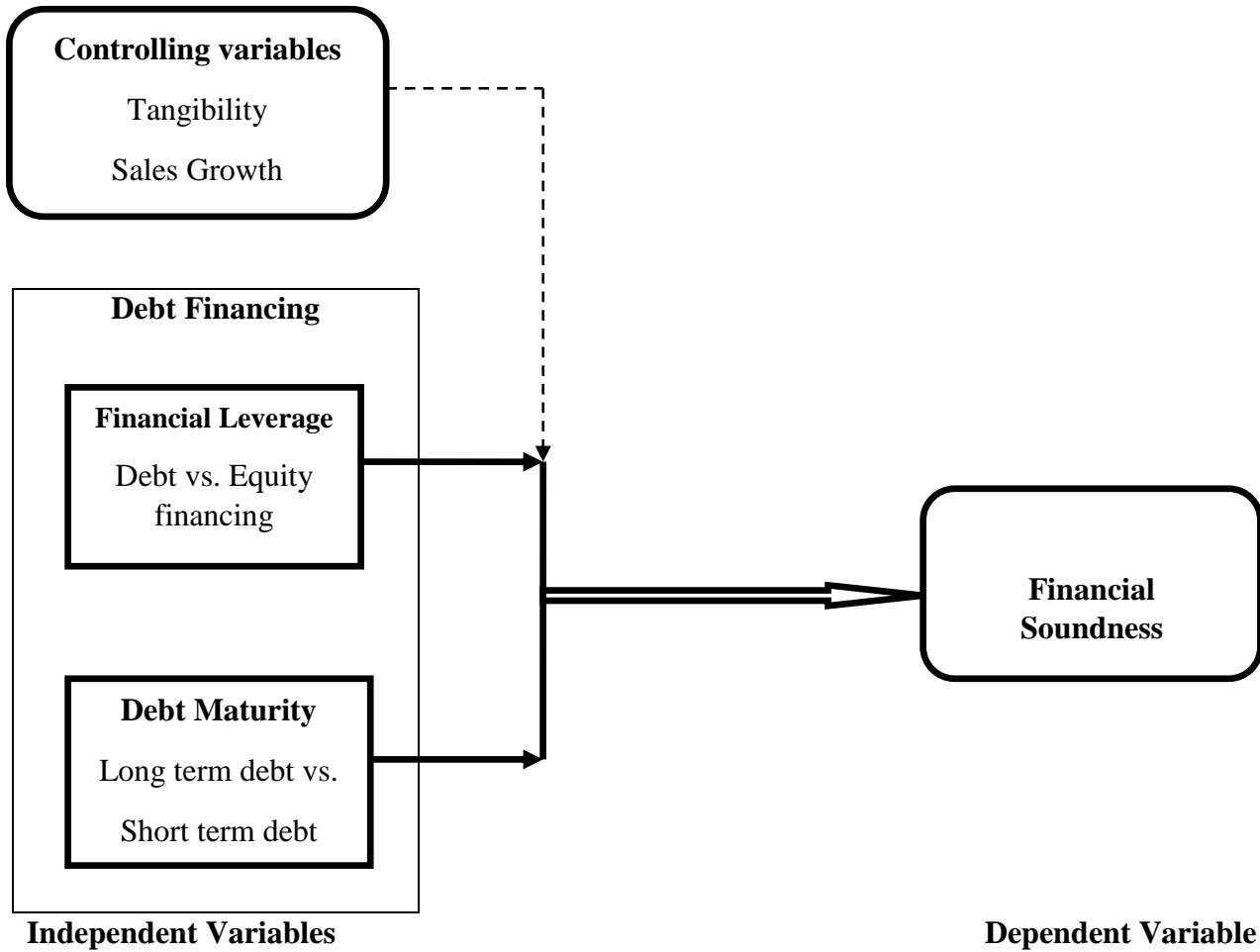


Figure 1: Conceptual Framework

## 3.0 METHODOLOGY

### 3.1 Research Design

The study employed Panel quantitative research design. This was because the data used in the study was of quantitative nature arrived at through ratios organized in form of panels. This research design is suitable in studies where both the cross-sectional and longitudinal characteristics of the units being studied are required (Gujarati, 2003).

### 3.2 Target Population



The population of the study comprised all the non-financial companies listed in the NSE as at December 2013. In total, 40 non-financial firms were listed in the NSE as at that date. 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). The study omitted firms listed within banking and insurance sectors since they are associated with tight regulations with regard to capital holding and liquidity operations. As observed by Mwangi et al. (2014), this heterogeneity makes it difficult to make it difficult to conduct hypothesis testing for the study.

### **3.3 Data collection Procedures**

The study used secondary data that was extracted from audited financial statements and annual reports of individual non-financial firms during the ten years period (2004 – 2013). Where relevant data was missing from the set of audited accounts, NSE handbooks that comprised of summaries of past financial information were used. The data obtained for all variables in each firm was organized in panels. According to Baltagi, Bratberg, and Holmås (2005) Panel data is suitable for longitudinal analysis because it provides both the time and cross-sections dimensions.

### **3.4 Data Analysis**

Upon extracting the relevant data from the financial statements and NSE hand books, Excel program was used to compute the ratios for the study variables in each firm for every year. Descriptive statistics such as measures of central tendency and measures of dispersion were used to summarize and profile the pattern in each firm. In addition, panel regression analysis using Stata Version 11 was employed to establish the nature and significance of the relationship between independent variables and dependent variable. Significance of individual explanatory variable on the dependent variable was carried out using t-test at 5% significance level. Joint significance of the regression model was performed by means of F-test.

### **3.5 Measurement of study variables**

The table below shows how the variables used in the study were measured and operationalized

Table 1: Measurement of Study Variables

Variables	Measurements	Notation
<b><u>Independent Variables</u></b>		
Financial Leverage	Total debt/Total capital	FINL
Long term debt	Total Non-current liabilities/Total debt	LTD
Short term debt	Total Current liabilities/Total assets	STD
Tangibility	Total Non-current assets/Total Assets	TANG
Sales growth	$\frac{Sales_t - Sales_{t-1}}{Sales_{t-1}}$	SG
<b><u>Dependent Variable</u></b>		
Financial Soundness	The Z-score index of financial distress as determined from the Altman's (1993) Model for the emerging markets	

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

Where:

Z = Financial distress index (emerging market score),

X<sub>1</sub> = Net working capital/Total assets,

X<sub>2</sub> = Retained earnings/Total assets,

X<sub>3</sub> = Earnings before Interest and Taxes/Total Assets,

X<sub>4</sub> = Book value of equity/Book value of total liabilities

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

Source: Altman & Hotchkiss (2006, pp. 267-8)

### 3.6 Empirical Model Specification

The study estimated the following regression model to determine the relationship between the individual factors and financial soundness.

$$FS_{it} = \alpha_0 + \alpha_1 FINL_{it} + \alpha_2 LTD_{it} + \alpha_3 STD_{it} + \alpha_4 TANG_{it} + \alpha_5 SG_{it} + \varepsilon_{it} \dots (1)$$

Where:

FS<sub>it</sub> = Financial soundness

$\alpha_0$  = Intercept term

$\alpha_1 - \alpha_5$  represents the coefficients of explanatory variables

$\varepsilon_{it}$  = Error term (the time-varying disturbance term is serially uncorrelated with mean zero and constant variance)

$i = 1, \dots, 40$

$t$  = time in years from 2004 – 2013

## 4.0 RESULTS AND DISCUSSIONS

### 4.1 Descriptive statistics

Table 2: Summary statistics

Variables	Mean	Std. Dev.	Median	Maximum	Minimum	Skewness	Kurtosis	Count
Z-score	7.851	3.008	7.445	19.423	-1.512	0.825	4.797	367
Total debt	0.451	0.171	0.441	0.882	0.068	0.090	2.211	367
Long term debt	0.396	0.284	0.361	0.964	0.000	0.207	1.694	367
Short term debt	0.281	0.177	0.264	0.775	0.008	0.509	2.509	367
Tangibility	0.561	0.225	0.606	0.980	0.038	-0.295	1.967	367
Sales growth	0.131	0.262	0.113	1.187	-0.633	0.758	5.746	329

Table 2 shows that on average, non-financial firms listed in NSE had a Z-score index of 7.85; which indicates a relatively financial sound situation for majority of the firms. The standard deviation of 3 coupled with maximum and minimum Z-score of 19.423 and -1.512 respectively shows a high variability on financial soundness levels among the firms. The results further shows that non-financial firms were on average modestly geared at approximately 45.1% with a standard deviation of 17%. This implies a higher preference for equity than debt by firms in financing their assets. This could be attributed to the high cost of debt capital as a result of prevailing high interest rates in Kenya.

The results further indicate that during the period of study, the firms had approximately 39.6% of their debt portfolio made up of non-current assets with 60.4% constituting current liabilities. This implies higher preference for short term debt in comparison to long term debt. This could be attributed to the fact that short term debt is more easily accessible since no much collateral is required (Maina & Ishmail, 2014). It is also notable that approximately 28.1% of total assets were financed using short term debt during the period of study with the rest being financed using equity and long term debt. This could be attributed to the fact that short term debt though easily accessible is normally costly in terms of high interest rates charged on it (Maina & Ishmail, 2014).

Table 2 also indicates that 56.1% of total assets were of fixed nature. This implies a high level of tangibility among the firms with a variability level of 22.5%. The results also shows that during the period of study, non-financial companies realized an average sales growth of approximately 13.1% with a standard deviation of 26.2%. This implied a sustained growth in sales turnover during the 10 years period covered by the study. Both the Skewness and Kurtosis shows that the data on all variables was nearly normally distributed (at 0 and 3) respectively and hence suitable for further statistical analysis.

#### 4.2 Panel data Diagnostic 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: panel unit root test, panel-level heteroscedasticity test, test for multicollinearity among independent variables and serial correlation test. Where violation to these assumptions was detected, appropriate remedies were employed.

##### 4.2.1 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  $\rho$  in the general equation:

$$Y_{it} = \alpha + \rho Y_{it-1} \pm \mu_{it} \dots \dots \dots (2)$$

Where:  $t = 1 \dots 10$  years and  $i = 40$  firms

If  $\rho = 1$ , it implied that the observation  $Y_{it}$  was dependent on its lag value  $Y_{it-1}$  and hence the data was non-stationary. The converse would be true if  $\rho < 1$ . 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 study applied Fisher-type test (with trend) because it has more advantages than other panel unit root tests. The Fisher-type unit root test requires specification of Dickey-Fuller to test whether a variable has unit root.

Table 3: Fisher-type (with trend) unit root test results

Variable	Statistic	P-value
Total debt	185.9272	0.0000

Long term debt	176.2539	0.0000
Short term debt	159.9525	0.0000
Tangibility	132.3837	0.0002
Sales Growth	286.908	0.0000

H<sub>0</sub>: All panels contain unit roots; Significance level: 5%

Based on the results displayed in Table 3, the study rejected the Null hypothesis that the panel data contained unit roots at 5% significance level. Effectively, the study concluded that all the variables under consideration did not have unit root and were therefore were used in levels instead of their first difference.

#### 4.2.2 Panel-level Heteroscedasticity Test

To test for panel level heteroscedasticity, the study adopted Breusch-Pagan/Cook-Weisberg test for heteroscedasticity. This involved first estimating the specified empirical model by OLS and then running the test against the null hypothesis of homoscedastic (constant) error variance (Torres-Reyna, 2007) . The tests results provided chi-square distribution value of 45.25 with a corresponding p-value of 0.0000. The results shows that the chi-square statistic was significant at 5 percent level and hence the null hypothesis of constant variance was rejected. This signified presence of panel-level heteroscedasticity in the study 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 instead of the ordinary least squares method.

#### 4.2.3 Serial Correlation Test

To detect presence of autocorrelation in panel data, the study used Wooldridge test for autocorrelation against the null hypothesis that there was no first order autocorrelation. The test results provided F-statistic value of 11.609 at 1 and 38 degrees of freedom. The F-statistic value had a corresponding p-value of 0.0016 indicating that the null hypothesis of no first order autocorrelation was strongly rejected at 5% significance level. The result therefore concluded that the panel data suffered from the problem of first-order autocorrelation. The study remedied this violation of classical linear regression model assumption by employing FGLS estimation technique (Mwangi et al., 2014).

#### 4.2.4 Test for Multicollinearity

The study tested for multicollinearity using pairwise correlation between the explanatory variables.

Table 4: Pairwise Correlation Matrix Results

	Z-Score	Total debt	Long term debt	Short term debt	Tangibility	Sales growth
Z-Score	1					
Total debt	-0.8095*	1				

Long term debt	0.0221	-0.1759*	1			
Short term debt	-0.4755*	0.6725*	-0.7919*	1		
Tangibility	-0.1524*	-0.1977*	0.7203*	-0.6608*	1	
Sales growth	0.0934	0.0426	-0.0033	0.0175	-0.0716	1

The asterisk \* signify significance at 5% level

Table 4 shows that the pairwise correlation coefficients between all independent variables except long term debt and short term debt were less than 0.8 implying that the variables did not exhibit severe multicollinearity as recommended by (Gujarati, 2003). The high negative correlation coefficient between long term debt and short term debt variables (-0.7919) indicated severe multicollinearity problem. To deal with this problem, the study dropped each of the highly collinear variable alternately while running the panel regression analysis as recommended by (Gujarati, 2003).

### 4.3 Panel Model Regression Results and Hypothesis Testing

#### 4.3.1 Hausman Specification Test

In order to establish which panel effects (between fixed and random) provided better estimation results for the study, Hausman test was carried out for the specified panel regression model. The test was conducted against the null hypothesis that random effect model was the preferred model. The Hausman test results provided a chi-square value of 13.53 and a corresponding p-value of 0.0189. The result indicated that the chi-square statistic was insignificant at 5% level. Effectively, the study failed to reject the null hypothesis that random effects model was appropriate. Therefore, the panel regression model was estimated for random effects as recommended by (Torres-Reyna, 2007).

Table 5: FGLS Random effects Panel Regression Results

Dependent Variable: Financial Soundness		
Variable	Equation 1	Equation 2
Constant	17.3800*(0.000)	19.0703*(0.000)

Total debt	-13.9236*(0.000)	-8.7332*(0.000)
Long term debt	3.28428(0.000)	
Short term debt		-8.7865*(0.000)
Tangibility	-8.1594*(0.000)	-8.5950*(0.000)
Sales growth	0.4399*(0.030)	0.3915*(0.042)
<b>Statistics</b>		
Adjusted R <sup>2</sup>	0.7770	0.7992
Rho	0.6196	0.6354
Wald Chi <sup>2</sup> (4)	761.0	861.61
Prob.(Wald)	0.0000	0.0000
Observations	367	367

\* Signified significance at 5% level

Table 5 shows the results of panel regression model (1) estimated under equations 1 and 2 for random effects with financial soundness being the dependent variable and total debt, long term debt, short term debt, Tangibility and sales growth as the independent variables. The results shows the models had a coefficient of determination (R-squared) equivalent to 0.7770 and 0.7992 respectively signifying that the fitted explanatory variables explained up to 77.7% and 79.92% of variations in the dependent variable. The Wald statistic of 791 and 861.61 together with the corresponding p-values of 0.0000 indicated that the explanatory variables were jointly statistically significant at 5% significant level.

The results displayed on Table 5 further shows that the coefficient of total debt was negative and significant at 5% level. The finding signifies that during the period of analysis, increasing total debt component within the capital structure led to a decline in financial soundness of non-financial firms listed in NSE. On the basis of these results, the study rejected hypothesis H01: Total debt does not significantly contribute to financial soundness of non-financial firms listed in NSE at 5% significance level. The implication of the finding is that debt financing is not favorable to non-financial firms as increasing this component invariably drives the firms to financial distress. Since firms can either be financed through debt or equity (Pandey, 2009), the results therefore points to the conclusion that equity financing is positively related with financial soundness. The finding was consistent with those by studies conducted by Gupta et al. (2014) and Mwangi et al. (2014). However, the result differed with the findings by El-Sayed Ebaid (2009) and (Kiogora (2000)).

Table 5 shows a positive and significant relationship between long term debt and financial soundness variables. The finding indicated that during the study period, increasing the non-current portion of total debt financing increased financial soundness of non-financial firms listed in NSE. Further, the results indicates a negative and significant relationship between short term debt-to-total assets and financial soundness variables. This finding signifies that increasing the short term portion of total debt significantly hampered the financial soundness of non-financial firms during the period of study. In the light of these results, the study therefore rejected hypothesis H02: Debt maturity has no significant effect on financial soundness of non-financial

firms listed in NSE at 5% significance level. The implication of the finding was that while non-financial firms with higher proportion of debt constituting of non-current portion were more financially sound, non-financial firms whose substantial debt was made up of current liabilities were financially distressed. The results supported the study findings by Schiantarelli and Sembenelli (1997) and Velnampy (2013). However, the findings were at variance with those by Aivazian et al. (2005).

Concerning the association between controlling variables and financial soundness, the study results showed that assets tangibility was negatively and significantly related with financial soundness at 5% level. The implication of the finding is that firms with higher proportion of total assets constituting fixed assets were financially unsound in comparison with firms that were less tangible. This could be attributed to the tendency by highly tangible firms to over-borrow on account of readily available collateral useful in securing borrowed capital. Further, the results showed a positive and significant relationship between sales growth and financial soundness of non-financial firms listed in NSE. The findings resonated with that by Kodongo, Mokoaleli-Mokoteli, and Maina (2014) whose study postulated a positive and statistically significant relationship between sales growth and profitability of firms listed in Kenya.

## **5.0 Summary and Conclusion**

The study found that total debt as represented by the proportion of total debt in the capital structure was negatively and significantly related to financial soundness of non-financial firms. The study therefore concluded that increasing the debt component within the capital structure of non-financial firms listed in NSE led to a decline in their financial soundness. Further, the study found the effect of long term debt on financial soundness to be positive and significant. In the light of this finding, the study concluded that increasing the proportion of non-current debt within the debt structure of non-financial firms significantly increased their financial soundness; hence is a favorable form of debt financing. The study also found a negative and significant association between short term debt and financial soundness of non-financial firms listed in NSE. On the basis of this finding, the study concluded that increasing the level of short term debt to finance the assets of non-financial firms significantly reduced their financial soundness; and hence is and unfavorable form of debt capital.

## **5.1 Recommendations**

Based on the empirical findings from the study, the researcher made a number of recommendations at both firm, and macro levels. Firstly, managers of non-financial firms should utilize debt financing sparingly as excessive debt use drove the firms to financial distress. Rather, equity financing should be encouraged. In circumstances where debt capital is used, finance managers should utilize more of long term debt and less of short term debt as non-current debt increases the financial soundness of their firms.



At macro level, government should ensure that the cost of debt for the non-financial firms is sustained at low levels that would be favorable to the firms. This could be achieved by ensuring low levels of inflation and foreign exchange rates that would translate to stable market interest rates. Financial institutions should also adopt policies that promote easy access to long term borrowing by non-financial firms. Such mechanisms may include relaxing the collateral requirements as well as opportunities to re-finance existing debt for longer periods.

## **5.2 Suggestion for Further Research**

This study was undertaken within the Kenyan context. A comparative analysis of the effect of debt financing on financial soundness among non-financial firms listed in other countries; preferably within the east African community could be undertaken. Further, a similar study involving firms listed within financial sector such as banks and insurance firms could be undertaken

## **References**

Abu-Rub, N. (2012). Capital structure and firm performance; Evidence from Palestine stock exchange. *Journal of Money, Investment and Banking*, 23, 109-117.

- Aivazian, V. A., Ge, Y., & Qiu, J. (2005). Debt maturity structure and firm investment. *Financial Management*, 34(4), 107-119.
- Akhtar, S., Javed, B., Maryam, A., & Sadia, H. (2012). Relationship between financial leverage and financial performance: Evidence from fuel & energy sector of Pakistan. *European Journal of Business and Management*, 4(11), 7-17.
- Baltagi, B. H., Bratberg, E., & Holmås, T. H. (2005). A panel data study of physicians' labor supply: the case of Norway. *Health Economics*, 14(10), 1035-1045.
- Baum, C. F., Schafer, D., & Talavera, O. (2006). The Effects of Short-Term Liabilities on Profitability: A Comparison of German and US Firms: Boston College Working Papers in Economics.
- Brennan, M. J., & Schwartz, E. S. (1984). Optimal financial policy and firm valuation. *The journal of finance*, 39(3), 593-607.
- Brick, I. E., & Ravid, S. A. (1985). On the relevance of debt maturity structure. *The journal of finance*, 40(5), 1423-1437.
- Damijan, J. P. (2014). Corporate financial soundness and its impact on firm performance: Implications for corporate debt restructuring in Slovenia.
- El-Sayed Ebaid, I. (2009). The impact of capital-structure choice on firm performance: empirical evidence from Egypt. *The journal of risk finance*, 10(5), 477-487.
- Ghosh, C., Nag, R., & Sirmans, C. (2000). The pricing of seasoned equity offerings: evidence from REITs. *Real Estate Economics*, 28(3), 363-384.
- Granger, C. W., & Newbold, P. (1974). Spurious regressions in econometrics. *Journal of econometrics*, 2(2), 111-120.
- Gujarati, D. (2003). Basic Econometrics Fourth Edition McGraw Hill Gujarati, DN,(2003). Basic Econometrics: McGraw Hill. International Edition.
- Gupta, P., Srivastava, A., & Sharma, D. (2014). Capital Structure and Financial Performance: Evidence from India.
- Hadlock, C. J., & James, C. M. (2002). Do banks provide financial slack? *The journal of finance*, 57(3), 1383-1419.
- Hillegeist, S. A., Keating, E. K., Cram, D. P., & Lundstedt, K. G. (2004). Assessing the probability of bankruptcy. *Review of accounting studies*, 9(1), 5-34.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360.
- Kalani, V., & Waweru, N. (2007). Commercial Banking Crises in Kenya: Causes and Remedies. *Research Paper. York University, Canada*.
- Kiogora, G. (2000). Testing for variations in the capital structure at the NSE. *An empirical study*.
- Kodongo, O., Mokoaleli-Mokoteli, T., & Maina, L. K. (2014). Capital structure, profitability and firm value: panel evidence of listed firms in Kenya. *Profitability and Firm Value: Panel Evidence of Listed Firms in Kenya (April 1, 2014)*.
- Krishnan, V. S., & Moyer, R. C. (1997). Performance, capital structure and home country: An analysis of Asian corporations. *Global Finance Journal*, 8(1), 129-143.
- Maina, L., & Ishmail, M. (2014). Capital structure and financial performance in Kenya: Evidence from firms listed at the Nairobi Securities Exchange. *International Journal of Social Sciences and Entrepreneurship*, 1(11), 209-223.
- Memba, F., & Nyanumba, J. (2013). Causes of Financial Distress: A Survey of Firms Funded by Industrial and Commercial Development Corporation in Kenya. *Interdisciplinary Journal Of Contemporary Research In Business*, 4(12), 1171-1185.

- Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American economic review*, 261-297.
- Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: a correction. *The American economic review*, 433-443.
- Moorhouse, A. (2004). An introduction to financial soundness indicators. *Bank of England* ([www.bankofengland.co.uk/statistics/ms/articles/art1feb04.pdf](http://www.bankofengland.co.uk/statistics/ms/articles/art1feb04.pdf)).
- Mugenda, O., & Mugenda, A. (2003). Research methods quantitative approaches African centre for technology studies (ACTS): Nairobi: Kenya.
- Mwangi, L. W., Muathe, S., & Kosimbei, G. (2014). Relationship between Capital Structure and Performance of Non-Financial Companies Listed In the Nairobi Securities Exchange, Kenya.
- Mwega, F. (2011). The competitiveness and efficiency of the financial services sector in africa: A case study of kenya. *African Development Review*, 23(1), 44-59.
- Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics*, 5(2), 147-175.
- Myers, S. C. (2001). Capital structure. *Journal of Economic perspectives*, 81-102.
- Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13(2), 187-221.
- Nerlove, M. (1968). Factors affecting differences among rates of return on investments in individual common stocks. *The Review of Economics and Statistics*, 312-331.
- OGBULU, O. M., & EMENI, F. K. A. Capital Structure and Firm Value: Empirical Evidence from Nigeria.
- Ogundipe, S. E., Idowu, A., & Ogundipe, L. O. (2012). Working capital management, firms' performance and market valuation in Nigeria. *World Academy of Science, Engineering and Technology*, 61(1), 1196-1200.
- Pandey, I. M. (2009). *Financial Management*: Vikas Publishing House Pvt Limited.
- Pratheepkanth, P. (2011). Capital structure and financial performance: evidence from selected business companies in Colombo stock exchange Sri Lanka. *Journal of Arts, Science & Commerce*, 2(2), 171-183.
- Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The journal of finance*, 50(5), 1421-1460.
- Ross, S. A. (1977). The determination of financial structure: the incentive-signalling approach. *The bell journal of economics*, 23-40.
- Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research Methods for Business Students*: Financial Times Prentice Hall.
- Schiantarelli, F., & Sembenelli, A. (1997). The Maturity Structure of Debt: Determinants and Effects on Firms' Performance? Evidence from the United Kingdom and Italy. *Evidence from the United Kingdom and Italy (January 1997)*. *World Bank Policy Research Working Paper*(1699).
- Sundararajan, V., Enoch, C., San José, A., Hilbers, P., Krueger, R., Moretti, M., & Slack, G. (2002). *Financial soundness indicators: analytical aspects and country practices* (Vol. 212): International Monetary Fund.
- Torres-Reyna, O. (2007). Panel data analysis. *Fixed & Random Effects [online]* Available at: <<http://dss.princeton.edu/training/Panel101.pdf>>, [Accessed 15 February 2013].

Velnamy, T. (2013). Corporate governance and firm performance: a study of Sri Lankan manufacturing companies. *Journal of Economics and Sustainable Development*, 4(3), 228-235.

Wiggins, V., & Poi, B. (2001). How do I test for panel-level heteroskedasticity.