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Effect of Debt Financing Options on Financial Performance of Firms Listed at the Nairobi Securities Exchange, Kenya

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Abstract

In spite of the dominance of the capital structure debate among both academic researchers and practitioners in the field of corporate finance over the last three decades, finding an optimal capital structure remains an ever-elusive gem. In particular, many contemporary firms are yet to find the optimum debt levels that maximises shareholder value. The purpose of this study was to examine the effects of debt configurations namely short-term, long-term and total debt on firm financial performance measured as return on assets and return on equity of listed firms in Kenya. The study utilizes panel econometric techniques named pooled ordinary least squares (OLS), fixed effects (FE) and random effects (RE) to analyze the effects of debt on financial performance of 40 non-financial firms listed on the Nairobi Securities Exchange between 2009 and 2015. Empirical results show that short-term, long-term and total debt have negative and statistically significant effects on returns on assets across OLS and RE. However, the debt measures have no significant effects on returns on equity across all estimation methods. These mixed empirical results partially follow both the trade-off and Modigliani and Miller's theoretical predictions and partly contradict the very theories. Consequently, financial managers should adjust debt levels to ensure that they operate at the optimum points. On the other hand, credit institutions should only finance businesses up to the point where profitability is maximized to mitigate against default risks associated with overleveraging.

Keywords: *Short-Term Debt; Long-Term Debt; Total Debt; Return on Assets; Return on Equity*

1.0 Introduction

Contemporary corporate finance managers across the global, regional and local markets continue to face the dual challenge of poor financial performance of their firms and finding optimum business financing options. These managers also have to grapple with the triple demands of creating wealth for investors, sustaining business operations and contributing to the growth of an economy. While existing theory suggests that debt is one of the main sources of financing the long-term activities of a firm that largely determine its performance, finding an optimal capital structure remains an ever-elusive gem (Nwude, Itiri, Agbadua, & Udeh, 2016; Prempeh, Sekyere, & Asare, 2016). Other than equity, debt is the second important form of capital structure. It involves the financing of a firm's operations and assets by issuing financial instruments such as short-term debt, long-term debt, loans payable, notes payable, bonds, debentures, etc (Chadha and Sharma, 2016).

The last three decades have seen the capital structure debate generally, and in particular debt financing gain considerable attention from both academic researchers and practitioners in the field of corporate finance (Chaklader & Chawla, 2016; Kebewar & Shah, 2012). Corporate finance literature across both developed and developing markets provides contradictory theoretical predictions on the relationship between debt financing and firm performance. Whereas, some scholars predict positive effects of debt on financial performance (Fosu, 2013; Margaritis and Psillaki, 2010), other scholars support negative influences of debt especially when firms are highly indebted (Bhagat and Bolton, 2008; Ghosh, 2008; Kayhan and Titman, 2007). The debt overhang problems suggest that high levels of debt would discourage investments because of increased costs of financial distress (Diamond and He, 2014).

The divergence of theoretical views on the link between debt finance and corporate performance is equally manifested in empirical literature. One stream of empirical literature has reported negative effect of debt on firm profitability (Nwude et al., 2016; Bui, 2017; Maçãs Nunes, Serrasqueiro, & Sequeira, 2009). The second stream has reported positive influence of debt on firm performance (Margaritis & Psillaki, 2009: Baum, Schäfer, & Talavera, 2006) while the third stream of literature has found evidence of a non-linear effects (inverse U-shaped relationship) (Seo, 2016; Kebewar, 2006). Additionally, non-significant effects have been confirmed by Kebewar and Shah, (2012), Chadha and Sharma (2016) and Raza (2013). These conflicting empirical results may be explained by differences in target populations with respect to country, sector, company and financial periods, application of varied methodological approaches as well as differences in the response (dependent) variables that measure firm performance. As such, the findings of these studies may not be reflective of an entire economy with various industries/sectors, a gap that this study attempted to address.

This study analysed the effect of debt on the financial performance of forty (40) non-financial firms listed on the Nairobi Securities Exchange (NSE) classified under 8 sectors of Kenya's economy, covering seven (7) financial years (2009 to 2015). A review of financial records of these firms over the sample period painted a gloomy picture of their financial performance. In particular, in the 2015 financial year alone, 16 (a quarter) out of the 63 companies that traded on the stock exchange had reported losses, while 24 of the companies (38 per cent) recorded falling after-tax profits, with only 23 firms, 37 per cent, declaring increased profits. These statistics demonstrated dwindling fortunes for a large number of listed firms against records of high leverage, thus providing an academic niche to build knowledge on the linkage between debt financing and firm performance over such a unique period. Notably, the period under study fell between Kenya's electoral cycles; two years just after the 2007 elections that came post-election violence and two years after the 2013 general elections associated with constitutional transition to the devolved system of governance. By their very nature, Kenya's elections are known to be very competitive and economically disruptive. Given the risks associated with debt financing choice, the imperative of assessing the effect of debt on firm performance at such a delicate business period cannot be overemphasized. Thus, the study aimed at examining the effects of long-term debt, short-term debt and total debt on the financial performance measured of listed non-financial firms.

2.0 Literature Review

2.1 Firm Financial Performance

The financial performance of a firm is a mathematical measure that evaluates how well it is using available resources to make profit. A review of literature reveals that the financial performance has been basically measured using three approaches: market, accounting, and survey measurements (Masa'deh *et al.*, 2015). While the first approach reflects the degree of satisfaction of the shareholders, the second captures internal efficiency of the firm while the last performance measurement approach provides subjective estimation of a firm's financial performance. The first approach is the most important to the shareholder because it is directly linked to how better off the shareholder is at the end of a period than he/she was at the beginning. The financial well-being of the shareholder can be determined using ratios derived from financial statements; mainly the balance sheet and income statement, or using data on stock market prices (Berger and Bonaccorsi di Patti, 2006).

In empirical studies linking capital structure to firm performance have extensively employed use of profitability measures such as return on assets (ROA) (Choi and Wang, 2009); return on equity (ROE) (Mahoney, LaGore, & Scazzero, 2008; Fauzi & Idris, 2009); return on sales (ROS) (Callan and Thomas, 2009); operating margin (Hammann, Habisch and Pechlaner, 2009); and Tobin's Q (Choi and Wang, 2009). In this paper, ROA and ROE are adopted as measures of firm financial performance. The reason for adopting these profitability measures is that respectively, they represent the ratios between earnings before interest and tax (EBIT) and total assets, and EBIT and total equity. While ROA represents the investor's earnings arising directly from commercial operations of the business without the effect of financing, ROE represents the percentage return that the stockholders earn on their investment. More so, these financial indicators have been widely adopted because a firm's long-term goal is almost always purely financial in nature, and thus financial performance evaluation indicators are directly connected to corporate financial goals (Vatavu, 2015).

2.2 Theories of Capital Structure

Modigliani and Miller's (1958) "irrelevance theory of capital structure" (MM theory) posits that under perfect capital markets assumption, the capital structure has no impact on firm's value. According to this theory, a firm's value is solely determined by its investment decision. This theory is criticized by many researchers objecting that there are no perfect capital markets in reality, although later the authors revised their earlier theory by

incorporating tax benefit and argued that under market imperfection where interest payments are tax deductible, firm value will increase with the level of financial leverage (Modigliani and Miller, 1963). Expanding on the MM theory, Jensen and Meckling (1976) developed the agency costs theory and explained that the agency problem is caused by a conflict of interest between shareholders and managers (agency cost of equity) or between shareholders and debt holders (agency cost of debt). The agency cost theory presupposes that use of debt will reduce the agency cost since payment of interest reduces the surplus cash (Seo, 2016).

The trade-off theory (TOT) argues that firms maximize their value through trade-off between the benefits and costs of debt and equity financing and reach an optimal capital structure even with the market imperfections such as taxes, bankruptcy costs and agency costs (Glover and Hambusch, 2014). According to the TOT, profitable firms can borrow more up to a certain level, because after that the profitability and the value of the firm will decrease due to interaction of bankruptcy costs and agency costs (Myers, 2001). Contrasting the trade-off theory, Myers & Majluf (1984) introduced the pecking order theory which suggests that there does not exist an optimal capital structure, but firms' source for funds in the order of retained earnings, then debt financing and finally equity as a last source to meet their funding requirements.

Deducible from the foregoing theoretical background is the fact that debt runs across all the theoretical postulations as a potential business financing option. However, only the TOT attempts to make a direct link between debt and firm performance. Thus, the TOT is adopted as the main theoretical underpinning for the current study augmented by the later version of the M & M (1963) theory. The agency cost theory is disregarded as it only indirectly attempts to link debt to firm performance through cash flow reduction that is associated with debt repayment. On the other hand, the pecking order theory is overlooked due to its preoccupation with prioritization of business financing options as opposed to the value of such options to firm performance. Previous empirical studies that have utilized TOT and M & M theories are reviewed in the next section.

2.3 Empirical Review and Hypothesis Development

Bokhari and Khan (2013) analyse the impact of capital structure on firm's performance in Pakistani's non-financial sector over a 7-year period from 2005 to 2011 and establish that both short-term debt (STD) and long-term debt (LTD) have a significant negative effect on ROA as well as negative effects on ROE. Addae, Nyarko-Baasi and Hughes (2013) analyse the effects of capital structure on profitability of 34 out of 35 firms listed on the Ghana Stock Exchange over a five-year period from 2005 to 2009. The OLS regression analysis in this study show that there is a statistically significant positive relationship between ROE and STD but a significantly negative relationship between ROE and LTD. However, the results revealed a statistically negative relationship between ROE and total debt (TD). Similarly, Gill, Biger and Mathur's (2011) examination of the effect of capital structure on profitability in a sample of 272 American manufacturing firms listed on the New York Stock Exchange for a period of 3 years from 2005 – 2007 show that ROE is significantly and positively affected by STD, LTD and TD ratios.

Sultan and Mustafa (2015) investigate the effect of capital structure on profitability among listed firms in Iraq and employ OLS regression analysis on panel data from firms within the industrial sector for the period (2004-2013). The study concludes that total debt ration positively and significantly affects ROA and ROE in the sample. Vatavu (2015) examines the relationship between capital structure and financial performance in 196 Romanian companies listed on the Bucharest Stock Exchange and operating in the manufacturing sector, over a period of eight-years (2003-2010). Results of this study reveal that ROA is significantly and negatively affected by TD ratio. Similar results have been reported by Chakraborty (2010) from an analysis of the determinants of capital structure of Indian firms using a panel of 1169 non-financial firms listed in either the Bombay Stock Exchange over the period 1995–2008 as well as Cheng's (2009) study of the relative effects of debt and equity financing on the operating performance of Taiwanese listed companies over the period from 1995 to 2004. Equally, Bokhari and Khan (2013) found a negative relationship between total debt and ROA and ROE among Pakistani's non-financial sector firms. Mwangi, Makau and Kosimbei (2014) investigated the relationship between capital structure and the performance among 42 non-financial companies listed at Kenya's Nairobi Securities Exchange covering the period 2006 - 2012. Analysis of panel data through feasible generalised least square (FGLS) regression techniques revealed that financial leverage was significantly and negatively associated with ROA and ROE.

In contrast, Kebewar and Shah's (2012) study of the effect of debt on corporate profitability among firms in the French service sector establishes that debt has no significant influence on profitability measured by ROA, as is the case with Ebaid's (2009) study of the impact of capital structure choice on firm performance among Egyptian

listed non-financial firms from 1997 to 2005. Yet, Tauseef, Lohano, and Khan (2013) examine the effect of debt financing on firm's financial performance, measured as return on equity of 95 textile companies in Pakistan from 2002-03 to 2007-08. Empirical results show a nonlinear relationship between return on equity and total debt ratio. Although ROE initially increases as the total debt ratio increases, once an optimal debt level is reached, ROE begins to decrease.

In summary, while the reviewed empirical studies showed that the relationship between total debt and firm financial performance measures are mixed, a large part of the available literature favour significant effects of debt, generally, on ROA and ROE. Notably, the statistical panel data analysis procedures and techniques employed in these studies are not uniform, some relying on OLS alone while others adopt fixed effects and random effects analysis in addition to OLS. Further, the study samples vary significantly in terms of sectoral/industry scope, panel size and sample periods covered. With these variations, coupled with contradictory results, we conclude that making directional *apriori* postulations to guide the current study is un feasible. Additionally, given the unique sample period (2009 - 2015) of this study as earlier indicated as well as the multi-industry sample coverage, the following null hypotheses are postulated in relation to the effects of STD, LTD and TD on firm's financial performance measured by ROA and ROE:

$H0_1$: Short-term debt has no statistically significant effect on financial performance measured by return on assets among firms listed on the NSE, Kenya and;

$H0_2$: Short-term debt has no statistically significant effect on financial performance measured by return on equity among firms listed on the NSE, Kenya

$H0_3$: Long-term debt has no statistically significant effect on financial performance measured by return on assets among firms listed on the NSE, Kenya and;

$H0_4$: Long-term debt has no statistically significant effect on financial performance measured by return on equity among firms listed on the NSE, Kenya

$H0_5$: Total debt has no statistically significant effect on financial performance measured by return on assets among firms listed on the NSE, Kenya and;

$H0_6$: Total debt has no statistically significant effect on financial performance measured by return on equity among firms listed on the NSE, Kenya

3.0 Data and Methods

3.1 Sample and Data

The study's sample comprised of non-financial firms listed on the NSE and whose annual financial statements were available and accessible over the sample period between 2009 and 2015. Initially, all the 63 firms listed on the Nairobi Securities Exchange over the sample period and classified into eleven (11) sectors were included in the study. However, firms in the banking and insurance services sectors were excluded because their financial statements differed substantially from those of other firms (Basil & Khaled 2011; Pandey 2001). In particular, the financial statements of firms in these sectors did not record short-term and long-term liabilities but rather recorded only total liabilities yet analysing the effect of both short-term and long-term in addition to total liabilities was an area of interest in this study. In addition, firms that had less than 5 years' annual financial statements records were excluded to enhance comparability and allow for valid generalizations. On the other hand, the investment services sector which comprised mainly the NSE was excluded because of its regulatory role over the other firms on the NSE, other than having financial records for only two financial years. Thus, the final sample had 40 listed firms from 8 sectors over the seven-year sample period as shown in Table 1.

Table 1: Distribution by Sector of the Sample Listed Firms

Sector	Number of Firms	Proportion of Firms (%) in Sample
1. Agricultural	6	15
2. Automobiles	3	7.5
3. Commercial Services	10	25
4. Construction and Allied	5	12.5
5. Energy and Petroleum	5	12.5
6. Investments	3	7.5
7. Manufacturing	7	17.5
8. Telecommunication	1	2.5
Total	**40**	**100**

Source: NSE (2015)

A cumulative total of 265 annual financial statement records were extracted. The financial data were obtained from the NSE Handbooks (2012 - 2013) and (2015 – 2016) retrieved from the NSE website (nse-handbook.html) complemented with individual firms' published full annual financial statements for all the years between 2009 and 2016. Notably, all listed public sector firms/companies in Kenya are required under the Companies Act 2015 to prepare and publish audited financial reports at the end of each financial year in a form specified by the Accounting Standards Board (ASB) and in accordance with applicable International Public-Sector Accounting Standards Board (PSASB). The NSE Handbook is prepared and published annually by the management of the NSE. The Handbook contains and compares balance sheets and income statements for at most the last five financial years for each listed company. Although the NSE Handbooks are mainly prepared for accountability to the public as well as providing information to the investors, they provided useful data on the variables in the current study for all the 40 listed firms that made up the final sample in a single document thus saving on time that would have been spent digging for the data in individual firms' financial reports. Nonetheless, some data/information on other variables that is not recorded directly in the balance sheets and income statements such as lease finance was obtained from the Notes to the Statements.

3.2 Variables

The study analysed the effects of debt financing options on the financial performance of firms listed at the NSE. Therefore, debt variables named short-term, long-term and total debt were used as the key explanatory variables while the response (dependent) variables included firm profitability variables, namely return on assets and return on equity. In addition to the key explanatory variables, firm size was included as a control variable that may affect firm performance. The definitions and computation of these variables as listed in Table 2 were adapted from literature reviewed to allow for meaningful comparison of the empirical results with those of prior empirical studies.

Table 2: Definition of Variables

Variable	Definition
Dependent Variables	
Return on Assets *(ROA)*	Ratio of Total Profits before Tax to Total Assets
Return on Equity *(ROE)*	Ratio of Total Profits before Tax to Total Equity
Explanatory Variables	
Short-term Debt *(STD)*	Ratio of Current Liabilities to Total Assets
Long-term Debt *(LTD)*	Ratio of Non-current Liabilities to Total Assets
Total Debt *(TD)*	Ratio of Total Liabilities to Total Assets
Control Variable	
Firm Size *(SIZE)*	Natural Logarithm of Assets

3.3 Panel Data Analysis Techniques

Given that the data was obtained from several firms over a period of seven years, panel data econometric technique namely pooled ordinary least squares (OLS), fixed effects (FE) and random effects (RE) were applied in modelling the effects of debt financing options on firm performance measures. The general regression model is expressed as:

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

Where *i* is firm and *t* is time; Y_{it} = the dependent variable of firm *i* in year *t*; X_{it} = K x 1 vector of explanatory (debt) variables and; α = K x 1 vector of constants; μ_{it} = error term.

In the above linear model, if unobserved heterogeneity is missing (i.e. no firm-specific effects) and the error term (μ_{it}) is not correlated with the predictor(s) (X_{it}), then estimating the model through OLS gives unbiased estimates which are consistent. However, if the unobserved individual effects (firm specific effects) are present which has been shown to be common in non-experimental research (Baltagi 2005), then the FE or RE estimation methods give better estimators than the OLS method.

With presence of unobserved individual effects, it is assumed that there is an individual firm-specific error term (α_i) and an idiosyncratic error term (ε_{it}) which is not correlated with either X_{it} or α_i such that the total error (μ_{it}) is equal to $\alpha_i + \varepsilon_{it}$. The linear model therefore becomes:

$$Y_{it} = \alpha + \beta X_{it} + \alpha_i + \varepsilon_{it}$$

If α_i is correlated to X_{it} , meaning that μ_{it} is correlated to X_{it} (since $\mu_{it} = \alpha_i + \varepsilon_{it}$), then the FE model would give consistent estimators whereas OLS estimators would be inconsistent. If on the other hand α_i is not correlated to X_{it} , OLS estimators would be consistent but inefficient because μ_{it} is heteroskedastic and serially autocorrelated (since the error term differs from firm to firm and therefore will not have constant variance). To increase the efficiency, the RE model is preferred. The rationale behind the RE models is that, unlike the fixed effects model, the variation across the industries is assumed to be random and uncorrelated with the predictor or independent variables included in the models across all time periods (Woodridge, 2016). By assuming that industry-specific error term is not correlated with the predictors, the RE models allow for time-invariant variables to play a role as explanatory variables (Green, 2008).

To test the relationship between business financing options and firm performance, the following OLS, FE and RE models respectively were used in this study:

$$Performance_{it} = \beta_0 + \beta_1 Debt_{it} + \beta_2 Size_{it} + \varepsilon_{it} \quad \text{..... I}$$

$$Performance_{it} = \alpha_i + \beta_1 Debt_{it} + \beta_2 Size_{it} + \mu_{it} \quad \text{..... II}$$

$$Performance_{it} = \beta_0 + \beta_1 Debt_{it} + \beta_2 Size_{it} + \varepsilon_i + \mu_{i,t} \quad \text{.....III}$$

$Performance_{it}$ = one of the two measures of financial performance (ROA & ROE) for the i^{th} firm at time *t;* $Debt_{it}$ = a proxy for one of the three debt financing options (STD, LTD and TD) for the i^{th} firm at time *t;* $Size_{it}$ = is the control variable for the i^{th} firm at time *t;* β_0 = the intercept; α_i = Intercept for firm i in year t; $\mu_{i,t}$ = the random error term for firm i in year t and; β_1 , β_2 = are the regression coefficients.

In determining the most appropriate method between OLS, FE and RE in modelling the effects of debt variables on firm performance in order to make useful inferences and conclusions in this study, a number of criteria are applied. First, the F-test of the joint significance of the fixed effects intercepts is used to make a choice between the OLS and FE. The null hypothesis is that all of the FE intercepts are zero. If the null is rejected, then the FE method is considered good fit to produce unbiased estimates and therefore chosen over the OLS (Woodridge,

2016). Secondly, to decide between RE and OLS, the Breusch-Pagan Lagrange Multiplier (LM) test is applied. The null hypothesis in the LM test is that variance across industries is zero, that is, there are no significant differences across industries (i.e. no panel effect) (Prob > Chibar^2 < 0.05). If we fail to reject the null, then the conclusion is that RE is not appropriate. That is, there is no evidence of significant differences across industries, therefore a simple OLS regression is appropriate (Green, 2008). Finally, to determine which model between FE and RE is appropriate, Hausman tests are conducted where the null hypothesis is that the preferred model is RE versus the alternative the FE. These tests whether the unique errors (μ_1) are correlated with the regressors, the null hypothesis is that they are not (Green, 2008). The Hausman test statistic (Prob > Chi2 < 0.05) indicates that the RE method may give biased and inconsistent estimators, hence the FE model is considered to give unbiased and consistent estimators.

4.0 Results and Discussion

4.1 Descriptive Statistics

The summary descriptive statistics of all the variables used in this study are presented in Table 3. Overall, the total debt (TD) was 46.29% for the sample period between 2009 and 2015. The average ratio of short term debt (STD) was relatively higher at 29.25% (ranging from 0% to 82.19%) when compared with the average ratio of long term debt (LTD) which stood at 17.78% (ranging from 0.2% o 96.11%).

Table 3: Descriptive Statistics for Debt Financing Options and Firm Performance

	No. of Observations	Min	Max	Mean	Std. Dev.
Financing Options					
STD	265	.0000	.8219	.2925	.1792
LTD	255	.0002	.9611	.1778	.1603
TD	265	.0002	1.1771	.4629	.2104
Firm Performance					
ROA	265	-2.0800	.4700	.0523	.1683
ROE	265	-5.5100	23.6300	.1669	1.5728
Moderating Variable					
SIZE	265	10.7200	19.6500	15.6989	1.7413

STD: Short Term Debt; LTD: Long Term Debt; TD: Total Debt: ROA: Return on Assets; ROE: Return on Equity; SIZE: Firm Size.

The results suggest that Kenya's listed firms overleverage compared with firms in developed economies, heavily relying on short-term than long-term debt financing of their operations. However, the results compare favourably with other developing economies such as Vietnam, Pakistan and Egypt. For instance, from their analysis of panel data of sample period 1998–2009, De La Bruslerie and Latrous (2012) reported that French companies had mean total leverage of 22%. Lin, Ma, Malatesta and Xuan's (2011) study of listed firms in 22 Western European and East Asian countries established that average total financial leverage was 33.4% for the sample period 1996-2008. Further, a study of Vietnamese listed firms by Le and Tannous (2013) during the period from 2007 to 2012 showed that average total leverage was 51.92%, with a mean short-term and long-term leverage of 41.09% and 10.83% respectively. Ebaid's (2015) study of Egyptian listed firms during the period of 1997-2005 revealed that the firms' short-term leverage was 49.22% compared to long-term leverage of 11.25% and average total debt of 60.22%.

In terms of firm performance, the overall mean return on asset (ROA) for the full sample was 5.23% while the average return on equity (ROE) was 16.69%. Values of ROA ranged from -2.08 to 0.470 while ROE ranged from -5.51 to 23.6, indicating high variability in performance among Kenya's listed firms. This is particularly so given that the standard deviations for ROA and ROE were 0.17 and 1.57 respectively suggesting that the highest variability in performance measures was with respect to ROE. Generally, these statistical results of firm performance suggest that Kenya's listed firms posted poor performance over the sample period from 2009 to 2015. With regard to firm size, another variable likely to affect firm performance as measured in this study, the value ranged from a minimum value of 10.72 to a maximum of 19.65, with the average size of sample firms being 15.70 and standard deviation of 1.74.

4.2 Correlation Analysis

The pairwise correlation results (Table 4) showed that most correlation coefficients between the predictor variables were generally low. The highest coefficients of correlation representing relationships between variables were between size and long-term debt (0.306) as well as size and total debt (0.318). Although the coefficients of correlation between TD and STD (0.67) as well as TD and LTD (0.56) were the highest as shown in the pairwise correlation matrix, total debt could not have been entered in the same regression models with STD and LTD as these two were components of TD. Most of the other correlation coefficients were below 30%. In addition, STD, LTD and TD are significantly and negatively correlated with ROA at $p<0.05$. Generally, these results of pairwise correlation analysis did not appear to suggest any concern with regard to manifestation of multicollinearity problems in the process of estimating the regression models.

Table 4: Coefficients of Correlation Between Measures of Debt, Firm Performance, Size

	STD	LTD	TD	ROA	ROE
STD	1.0000				
LTD	-0.2409***	1.0000			
TD	0.6718***	0.5583***	1.0000		
ROA	-0.1832**	-0.1384**	-0.2647***	1.0000	
ROE	-0.0470	0.0362	-0.0149	0.2957***	1.0000
SIZE	0.0984	0.3062***	0.3184***	0.0940	0.0388

** significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level; STD: Short Term Debt; LTD: Long Term Debt; TD: Total Debt; ROA: Return on Assets; ROE: Return on Equity; SIZE: Firm Size*

4.3 Regression Analysis Results

Pooled OLS, fixed effects (FE) and random effects (RE) regressions were employed to analyse the effect of the three components of debt (STD, LTD and TD) on firm performance measured by ROA and ROE while controlling for firm SIZE. OLS has been critiqued for being simplistic and failing to adjust for unobserved time-invariant confounders that are largely industry/firm-specific (Woodridge, 2016). In this study, the FE and RE estimation techniques are used to control for all time-invariant differences between the industries such that the estimated coefficients of the FE and RE models cannot be biased due to such omitted time-invariant and industry/firm specific variables such as organizational culture (Baltagi, 2005). Thus, the effects of debt variables on firm performance measured were also through FE and RE modelling.

As the results in Table 5 show, firm performance measured by ROA is negatively affected by STD under both OLS ($\beta = -0.1826$; $p<0.001$) and RE ($\beta = -0.1795$; $p<0.05$). However, firm performance measured by ROE is not significantly affected by STD across the three different estimation techniques. According to the results, firm size does not significantly affect performance based on both ROA and ROE measures across the different estimation methods. The Breusch-Pagan χ^2 test was significant at $p<0.05$ the ROA, suggesting that the RE model is more suitable than pooled OLS. On the other hand, the Hausman test statistic used to compare FE and RE models was non-significant ($\chi^2 > 0.05$), indicating that the RE estimation results were more reliable.

With regard to the effect of LTD on firm performance, the regression results in Table 6 show that LTD significantly and negatively affected ROA both in OLS ($\beta = -0.2041$; $p<0.005$) and RE ($\beta = -0.1745$; $p<0.005$) but the effects are non-significant in FE though negative. Firm size has positive effect on ROA in the presence of LTD ($\beta = 0.0155$; $p<0.005$) in OLS. Listed firms that employ long-term debt only risk a potential decline of up to 0.2% in ROA for every unitary percentage increment in long-term debt. On the contrary, LTD does not significantly affect ROE across OLS, FE and RE estimations.

Table 5: Effect of Short-Term Debt on Firm Performance

Firm Performance	Predictors	Pooled OLS	Fixed Effects	Random Effects
ROA	**Constant**	-0.0636	0.0316	-0.0547
		(0.0939)	(0.5020)	(0.1320)
	STD	-0.1826***	-0.1698	-0.1795**
		(0.0576)	(0.1167)	(0.0732)
	SIZE	0.0108*	0.0044	0.0101
		(0. .0059)	(0.0323)	(0.0083)
	Observations	*265*	*265*	*265*
	R^2	0.038	*0.0097*	*0.0096*
	F-test	6.17	*1.50*	
	Prob > F	0.0024	*0.3444*	
	Wald Chi^2			*7.01*
	Prob > Chi^2			*0.0300*
	F-test that all u_i=0		*2.47*	
	Prob > F		*0.0000*	
	Breusch-Pagan test - $Chibar^2$			21.53
	Prob > $Chibar^2$			0.0000
	Hausman Test Chi^2			0.04
	Prob > Chi^2			0.9817
		Pooled OLS	**Fixed Effects**	**Random Effects**
ROE	**Constant**	-0.3270	-1.1621	-0.3270
		(0.8965)	(5.3335)	(0.8965)
	STD	-0.4538	-1.2012	-0.4538
		(0.5536)	(1.2370)	(0.5536)
	SIZE	0.0400	0.1072	0.0400
		(0.05687)	(0.3440)	(0.0568)
	Observations	265	*265*	*265*
	R^2	-0.0036	*0.0044*	*0.0044*
	F-test	0.53	*0.48*	
	Prob > F	0.5882	*0.6209*	
	Wald Chi^2			*1.06*
	Prob > Chi^2			*0.5875*
	F-test that all u_i=0		*0.99*	
	Prob > F		*0.4973*	

** Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level; STD: Short Term Debt; LTD: ROA: Return on Assets; ROE: Return on Equity; SIZE: Firm Size;* (The values in parentheses below each regression coefficient are standard errors associated with the respective variables in the models)

Table 6: Effect of Long-Term Debt on Firm Performance

Firm Performance	Predictors	Pooled OLS	Fixed Effects	Random Effects
ROA	**Constant**	-0.1581	0.1313	-0.1320
		(0.0987)	(0.5149)	(0.1313)
	LTD	-0.2041**	-0.1017	-0.1745**
		(0.0706)	(0.1170)	(0.0825)
	SIZE	0.0155**	-0.0040	0.0135
		(0.0064)	(0.0328)	(0.0085)
	Observations	265	*265*	*265*
	R^2	0.0338	*0.0038*	*0.0032*
	F-test	5.39	*0.40*	
	Prob > F	0.0051	*0.6680*	
	Wald Chi^2			*5.59*
	Prob > Chi^2			*0.0611*
	F-test that all u_i=0		*2.36*	
	Prob > F		*0.0001*	
	Breusch-Pagan test - $Chibar^2$			19.47
	Prob > $Chibar^2$			0.0000
	Hausman Test Chi^2			0.99
	Prob > Chi^2			0.6110
		Pooled OLS	**Fixed Effects**	**Random Effects**
ROE	**Constant**	-0.3161	-0.1157	-0.3161
		(0.9507)	(5.4525)	(0.9507)
	LTD	0.2844	1.6907	0.2844
		(0.7566)	(1.7339)	(0.7566)
	SIZE	0.0277	-0.0002	0.0277
		(0.0625)	(0.3476)	(0.0625)
	Observations	265	*265*	*265*
	R^2	-0.0060	*0.0046*	*0.0038*
	F-test	0.26	*0.48*	
	Prob > F	0.771	*0.6205*	
	Wald Chi^2			*0.52*
	Prob > Chi^2			*0.7708*
	F-test that all u_i=0		*0.96*	
	Prob > F		*0.5357*	

** Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level; LTD: Long Term Debt; ROA: Return on Assets; ROE: Return on Equity; SIZE: Firm Size;* (The values in parentheses below each regression coefficient are standard errors associated with the respective variables in the models)

The F-test that all industry-specific errors representing time-invariant individual characteristics (F-tests that all u_i=0) was significant at p<0.001, suggesting rejection of the null hypothesis that all of the FE intercepts are zero, hence the FE model produced unbiased estimates than the OLS. However, the Hausman test statistic for the FE and RE models was non-significant (Prob > χ^2 > 0.05), suggesting that the RE results would provide more reliable estimation of the effects of LTD on ROA.

Overall, as the results presented in Table 7 indicate, total debt (TD) has a significantly negative effect on firm performance when measured in terms of ROA both under OLS (β = -0.2651; *p*<0.001) and RE (β = -0.2311; *p*<0.001) estimations, but non-significant in FE. The effect of firm size on ROA is also positive and significant at p<0.05 in both OLS and RE but non-significant under FE. However, the effect of total debt on ROE follows the trend shown by regressing STD and LTD on ROE and remains non-significant across OLS, FE and RE estimations. Since the F-tests suggests that the null hypothesis that all of the FE intercepts are zero should be rejected while the Hausman test shows that the null hypothesis that RE would produce unbiased estimates, the RE estimation results are considered as such in this study due to significant variances across industries.

Table 7: Effect of Total Debt on Firm Performance

Firm Performance	Predictors	Pooled OLS	Fixed Effects	Random Effects
ROA	**Constant**	-0.1338	-0.0366	-0.1160
		(0.0899)	(0.4663)	(0.1197)
	TD	-0.2651***	-0.1550*	-0.2311***
		(0.0495)	(0.0863)	(0.0583)
	SIZE	0 .0196***	-0.0102	0.0175**
		(0 .0060)	(0.0303)	(0.0079)
	Observations	265	*265*	*265*
	R^2	0.0999	*0.0145*	*0.0144*
	F-test	15.59	*1.63*	
	Prob > F	0.0000	*0.1985*	
	Wald Chi^2			*16.99*
	Prob > Chi^2			*0.0002*
	F-test that all u_i=0		*2.02*	
	Prob > F		*0.0008*	
	Breusch-Pagan test - $Chibar^2$			8.48
	Prob > $Chibar^2$			0.0018
	Hausman Test Chi^2		1.45	
	Prob > Chi^2		0.4833	
		Pooled OLS	**Fixed Effects**	**Random Effects**
ROE	**Constant**	-0.4218	-0.6174	-0.4218
		(0.8886)	(4.9516)	(0.8886)
	TD	0.2401	-0.2352	-0.2401
		(0.5037)	(1.0490)	(0.5037)
	SIZE	0.0444	0.0567	0.0444
		(0.0594)	(0.3225)	(0.0594)
	Observations	265	*265*	*265*
	R^2	-0.0053	*0.0003*	*0.0003*
	F-test	0.31	*0.03*	
	Prob > F	0.7344	*0.9686*	
	Wald Chi^2			*0.62*
	Prob > Chi^2			*0.7342*
	F-test that all u_i=0		*0.99*	
	Prob > F		*0.5003*	

** Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level; TD: Total Debt; ROA: Return on Assets; ROE: Return on Equity; SIZE: Firm Size;* (The values in parentheses below each regression coefficient are standard errors associated with the respective variables in the models)

Due to presence of heteroskedasticity across all estimated models, the ROA fixed-effects models were estimated using the robust standard errors method to control for heteroskedasticity. The results showed that the effect of all the debt variables (STD, LTD and TD) on ROA become completely non-significant using the robust standard errors. The goodness of fit of the ROA regression models whose significant coefficients have been highlighted are reflected in the models' overall *F*-tests, all of which have *p*-values less than 0.05 as reported below each model in the tables presented earlier. It is also important to note from the regression results that short-term, long-term and total debt ratios have no significant effects on ROE as depicted by the non-significant β coefficients of STD, LTD and TD in corresponding estimation models.

Discussion

Findings from the descriptive analysis of data on these debt variables revealed that during the sample period from 2009 to 2015, the non-financial companies that comprised this study's sample operated with an average total debt ratio of 46.29%. The average ratio of short term debt was 29.25%, which was relatively higher than the average ratio of long term debt at 17.78%. Already discussed in section 4.2, these findings suggest overleverage on the part of Kenya's listed firms compared with firms in developed economies, favourably compare with other developing economies such as Vietnam, Pakistan and Egypt (De La Bruslerie and Latrous, 2012; Lin *et al.,* 2011; Le and Tannous, 2013; Ebaid, 2015).

Overdependence on short-term rather than long-term financing by Kenya's listed firms may be attributed to unpredictability of commercial bank rates that make long-term debt costly and the high rate of return on equity financing. In addition, this scenario may also be explained by limited bond market which has favoured the development of non-securities markets that is dominated by both local and international commercial banks and other financial institutions. The banks and financial institutions readily provide short-term loans on more favourable financing terms compared to long-term financing, thus making short-term debt common among the firms.

The results of OLS regression estimation of the effects of debt on firm performance showed that both short-term and long-term debt ratios had significantly negative effects on firm performance as measured by ROA. Overall, total debt ratio significantly and negatively affected both ROA. Estimation of the models through the fixed-effects and random effects methods to control for all time-invariant differences between the industries showed that the significant negative regression coefficients for STD, LTD and TD in ROA models were largely retained despite degradations in relative size. Notably, Hausman's test for the ROA regressions indicated that RE estimation method was the most relevant for the sample to give unbiased and consistent estimators. However, across all models and estimation methods, LTD, STD and TD have no significant effect on firm performance as measured by ROE. Based on these results, the null hypotheses $H0_2$, $H0_4$ and $H0_6$ are supported, hence the study fails to reject the three hypotheses. On the other hand, the null hypotheses $H0_1$, $H0_3$ and $H0_5$ are not supported and are rejected, favouring the alternatives that short-term debt, long-term debt and total debt have statistically significant effects on financial performance measured by return on assets among firms listed on the NSE in Kenya.

The results of the current study are largely consistent with previously reported empirical studies such as Vătavu (2015) who reported negative effects of short term debt and total debt on ROA among Romanian manufacturing firms based on OLS, FE and RE estimations. Abbadi & Abu-Rub (2012) and Bokhari & Khan (2013) reported that short term debt, long term debt and leverage of the firm negatively affected ROA among listed non-financial firms in Pakistan, while Hasan, Mainul Ahsan, Rahaman, & Alam (2014) found that ROA is negatively related to long-term debt. On the other hand, the results of the current study contradict the findings of Fosu (2013) that financial leverage has a positive and significant effect on firm performance among South African listed firms. Additionally, the finding herein that debt negatively affects Tobin's Q contrast with Hasan *et al.'s* (2014) reportage of a statistically non-significant relationship between capital structure and firm's performance as measured by Tobin's Q. The absence of a statistically significant effect of debt on ROE in this study is in conformity with Ebaid's (2008) finding that capital structure (STD, LTD, and TD) has no significant impact on firm's performance measured by ROE among listed firms in Egypt.

The consistency of the negative coefficients on the three configurations of debt ratio under OLS, FE and RE estimation methods illustrate the robustness of the findings, which reasonably suggest that in the context of Kenya's listed firms, the more debt firms employ the less profitable they will be. Whilst these findings do not support most existing theories that imply that there is a positive relationship between capital structure and firm performance such as the "debt irrelevance theorem" of Modigliani and Miller (1958), they are largely consistent with most of the empirical evidence from emerging economies which show that capital structure (particularly leverage) negatively affects firm performance. Nonetheless, the results of the study that have brought out the negative effect of leverage on firm performance are consistent with the proposition of Pecking Order Theory

As noted earlier, the results of this study have shown that Kenya's listed firms employ relatively higher debt levels. These high levels of leverage increases cash flow which probably influences firm managers to engage in discretionary behaviour thus leading to negative effects of these debt levels on firm performance. Whilst the agency theory suggests that firms choose higher debt levels in order to mitigate the agency problems between managers and shareholders, which in turn enhance the value of the firm, Kenyan firms appear to be employing inappropriately higher debt levels. Such high levels of leverage may increase the lenders' influence through infliction of stringent debt covenants, which in turn limit the managers' ability to operate freely, thereby negatively affecting the firm performance.

5.0 Conclusion and Recommendations

This study analysed the effects of debt financing on the financial performance of non-financial firms listed on the NSE over the 2009 – 2015 sample period. Three configurations of debt namely short-term, long-term and total debt were employed as the main predictors of firm performance measured using ROA and ROE. In addition, firm size was also included as a control variable. The descriptive results revealed that listed firms in Kenya

employ higher levels of short-term compared to long-term debt financing. The average leverage ratio comparatively matches the practice in other developing economies but obviously exceeds the level of leverage in developed economies.

Regression analysis results showed that all the three debt configurations, short-term, long-term and total debt negatively and significantly affected returns on assets in OLS and random effects estimation techniques. Non-significant results were obtained in fixed effects modelling debt-ROA relationships, with Hausman tests showing that random effects were better off in producing unbiased estimators in this study. On the contrary, debt measures did not produce any significant effects on firm performance measured in terms of return on equity across all modelling/estimation techniques. The significant negative effects of debt on firm performance show that higher levels of leverage undermine returns of assets among NSE-listed non-financial firms. These negative results, while departing from the tenets of Modigliani and Miller's (1958) predictions, partially follow the trade-off theory, the later version of M & M (1963) as well as the findings of previous empirical studies underpinned by these theories. Nonetheless, the non-significant effects of debt on ROE are in line with Modigliani and Miller's (1958) postulations of the irrelevance of capital structure to firm's financial performance, that capital structure has no impact on firm's value. The trade-off theory predicts that use of debt maximizes profitability up to some optimum debt level after which profitability declines.

Following partial conformity with both the TOT and M & M theoretical predictions, this study reiterates the imperatives of financial managers in firms, public and private alike, selecting debt financing models that have a high likelihood of optimizing the financial performance of the firm. In particular, financial managers should adjust debt levels to ensure that they operate at the optimum point that enhances firm value while avoiding the negative trajectory as predicted by the trade-off theory. On the other hand, credit institutions should judiciously consider the effects and risks of overleveraging on firm performance and only finance businesses up to where profitability is maximized as the risk of credit default is likely to increase with overleveraging. Generally, drawing from the tenets of the agency theory, financial managers should strive to minimize debt and select other financing options that maximize shareholder's wealth.

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