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Observed leverage and financial performance of listed firms in Kenya

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Abstract

Capital structure management is one of the most crucial corporate financial management functions in a firm since appropriate debt policy is reported to maximize the value of a firm. Kenya is ranked second in Africa after South Africa in regards to financial deepness. This means that the cost of debt should not have adverse effect financial performance. This observation raises fundamental question: does debt financing leads to poor financial performance in Kenya? This research sought to investigate the role of observed leverage on financial performance of listed non- financial firms in Kenya. The study tested capital structure theories and therefore adopted a positivists approach, guided by causal research design. The study population was 35 non-financial sub-sector firms out of the 65 firms listed at the NSE, Kenya. 18 firms were excluded in this study since they belong to banking and insurance sub-sectors, which have a highly regulated capital structure. Secondary data collection sheet was used to collect data for each of the variables from audited financial statements of the listed firms for a 10-year period (2006-2015). Panel regression analysis revealed that observed leverage measured by (LDR) had a significant positive coefficient with performance metrics. However, the leverage measure using TDR showed a negative and significant role on performance metrics. This study recommends that for listed firms to improve their financial performance, they should use more long-term debts than short-term debts.

Keywords: *Capital Structure; Observed Leverage; Financial Performance; Listed Firms*

JEL classification*: G32; G23; G24; G15* *Submitted: 14.09.2018* *Accepted 10.11. 2018*

Introduction

Capital structure is at the core of modern corporate finance. The debate on capital structure was triggered by the seminal contribution by Modigliani and Miller (1958,1963) which has seen a tremendous development in literature on the same (Hovakimian, Hovakimian, & Tehranian, 2004). However the debate on capital structure remains a puzzle more than half a century after Modigliani and Miller contribution

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(Berens & Cuny, 1995). The debate has been informed by four key approaches; the trade-off theory, pecking order theory, free cash flow theory and market timing theory (Deangelo & Roll, 2015) but the two main theories are trade-off and pecking order theories (Haas & Peeters, 2006).

The trade-off theory developed by Myers (1977) argued that there are benefits that accrue to using debt which are reduced agency costs and tax shields. On the other hand, the costs include bankruptcy costs and financial distress costs. Therefore, optimal capital structure is obtained when the net tax advantage of debt balances equals to the related costs. On the other hand pecking order theory states that firms have preference in regards to financing which is informed by the availability of the cost and its relative cost (Myers and Majluf, 1984). Pecking order theory as compared to trade-off theory do not have a target leverage level. Rather, the current leverages always reflect past profitability which informs the need for additional investments.

Since the work of Modigliani and Miller (1963), capital structure decisions have remained a puzzle to most of the financial managers despite various studies done(Nassar, 2016). Debt financing is an important source of finance that influences financial performance of firms and financial managers have the mandate of ensuring the they use debt prudently so as to maximize the value of the firm in cognizant of the financial distress costs(Hassan, 2016). Though extant literature has been done in developed markets, different views have risen on the relationship between observed leverage and financial performance. Some researchers find a positive relationship (Akhtar, 2012; Chinaemerem, 2012; Nassar, 2016). On the contrary, others researchers find a negative relationship(Chen, 2002; Laeven & Perotti, 2010; Salim & Yadav, 2012).

Using Kenyan data, a total of KES 92.48 billion of bonds were listed as at 2012, compared to 5.1 billion shares valued at approximately KES 868 billion. This shows that debt financing through bonds appears to be less popular compared to equity. This presents the likelihood that listed firms in Kenya could be using expensive source of finance preferably from banks, thereby leading to negative effect on profitability. This research is anchored on the fact that the World Economic Forum (2013) rates Kenya second in Africa after South Africa in regards to financial deepness. This means that the cost of debt should not be too high as to have an adverse effect on financial performance. Therefore, the null hypothesis of the study is that observed leverage has no role on financial performance of companies listed at the Nairobi Securities Exchange.

The study is organized as follows: Following the introduction in section one of this paper, section two discusses capital structure theories and past studies regarding observed leverage and financial performance. Section three outlines the methodology, results, conclusions and suggestions for further studies.

Literature Review

Capital structure is at the core of contemporary finance. Bradley, Jarell and Kim (1984) suggested that the most contentious issue in corporate finance is the theory of capital structure. The seminar work of Modigliani and Miller (1958, 1963) formed the basis of the first capital structure theorem. Modigliani and Miller (1958) argued that the capital structure of a firm is irrelevant to the firm's value, assuming perfect markets and zero transaction costs. Moreover, they believed that a firm's leverage has no effect on its market value. This theory involved the following assumptions: capital market is efficient and individuals external and internal to the organization have information symmetry; there are no transaction costs or bankruptcy costs, and choosing between debt and equity financing is irrelevant. Modigliani and Miller sees capital structure as the result of mainly financial, tax and growth factors (Modigliani and Miller, 1958).

Modigliani and Miller (1963) reviewed their 1958 theory, included tax advantages in the theory as a determinant of capital structure and concluded that firms use debt financing to make use of tax advantages, and to maximize firms' market value, more debt has to be used in the capital structure. Since the contribution of Modigliani and Miller (1963), the debate on capital structure remains a puzzle (Myers, 2000). At the core of the debate are trade-off theory, pecking order theory.

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Trade-off theory was proposed by Myers (1977) and is based on the proposition that there exists an optimal capital structure of a firm which can be determined by creating balance between tax effects, agency costs and bankruptcy costs. The theory therefore predicts that firms will choose their mix of debt and equity financing to balance costs and benefits of debt. The tax benefit of debt and control of free cash-flow problems push firms to use more debt financing while bankruptcy costs and other agency problems provide firms with incentives to use less. One of the main empirical prediction of this theory is that debt ratios will tend to be mean reverting as firms use the external capital markets strategically to keep their values at a close to their optimum (Fama & French, 2011). Modigliani and Miller (1958) also developed two approaches to trade-off theory namely; static trade-off approach and dynamic trade-off approach.

The Static trade-off theory focuses on the benefits and costs of issuing debt. It predicts that an optimal target debt ratio exists, which maximizes the value of the firm. The optimal point can be attained when the marginal value of the benefits associated with debts issues exactly offsets the increase in the present value of the costs associated with issuing debt (Myers, 2001). The static approach assumes that observed leverage equals to target leverage. This is opposed to dynamic trade-off theory that suggests that due to market imperfections and market shocks, the observed leverage is not equal to target leverage. Therefore, firms operating below or above the target leverage will adjust to the target level at a certain speed with cost in consideration(Lambrinoudakis, 2016)

On the other and, pecking order theory developed by Myers and Majluf (1984) proposes that due to information asymmetry, managers will prefer using up internal finance first, followed by risky debts and finally resorting to new equity issues to finance new investments. Therefore, changes in debt ratios are driven by the need for external funds, not by an attempt to reach an optimal capital structure. In contrast with the trade-off theory There is no well –defined target debt ratio under the pecking order theory (Nunkoo & Boateng, 2015).

Observed leverage is a reflection of firm's past financial choices made by managers to maximize the wealth of shareholders (Haas & Peeters, 2006). Empirical evidence on the relationship between observed leverage and the financial performance of firms has been the subject of several studies since the seminal work of Jensen and Meckling (1976). However, the evidence on these relationships has been mixed. Some researchers find a positive relationship between observed leverage and firms' financial performance while others show evidence of negative relationship. There is also a strand of researchers who reveal mixed results based on industry or firm specific characteristics.

Hove (2017) studying on "The Impact of Capital Structure on Company Profitability on Companies Listed at JSE" over a period of 2006-2015 found that total debt and long-term debt have a negative influence on the profitability of all sectors. This agrees with Khan (2012) in his study of 36 engineering sector firms from the Karachi Stock Exchange (KSE) showed that financial leverage measured by the ratios of Short Term Debts to Total Assets (STDTA) and Total Debts to Total Assets (TDTA) had significant negative relationship with firm's performance measured by return on assets (ROA) and gross profit margin (GM). In the same vein, Musah (2017) on his research on "The impact of capital structure on profitability of firms in Ghana" revealed that short-term and long-term debt ratio had a negative effect on profitability. Similar results are revealed by Onaolapo and Kajola (2010) who found a significant negative relationship of listed firms in Nigeria. Using Kenyan data, Kiogora (2000), Koech (2013) and Macharia (2016) also reports a negative relationship between returns of firms and their levels of financial leverage. On the other hand (Roden and Lewellen, 1999; Champion, 1999; Ghosh and Jain, 2000; Hadlock and James, 2002 and Berger and Bonaccorsi, 2006). These researchers generally argue that observed leverage has a positive effect on a firm's returns on equity provided that the firm's earnings power exceeds its interest cost of debt (Hutchinson, 1995) and that the level of leverage a firm should commit itself to depends on the flexibility with which the firm can adjust its debt usage should earnings power fall below its average interest cost (Hadlock and James, 2002). In an interesting study of the banking sector, Berger and Bonaccorsi (2006) demonstrate that high leverage ratio is related to higher profit efficiency.

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Research and Methodology

The study population was 35 non-financial sector firms out of the 65 firms listed at the NSE, Kenya for the period 2006-2015. This was due to the exclusion of banking and insurance industry since they have a regulated debt level (Antwi, Fiifi, Atta, Polytechnic, & Kf, 2012; Chen, 2002; Deesomsak, Paudyal & Pescetto ,2004).

The secondary data was collected from the audited financial statements of the listed firms in the NSE. This involved using only the audited reports maintained at the NSE and CMA since they ensure consistency of reporting and are reliable for analysis purposes. Kodongo, Mokoaleli-mokoteli, & Maina (2015) studying "Capital structure, profitability and value: panel evidence of listed firms in Kenya" used audited financial statements as secondary data. The data was collected with the help of a data collection sheet.

This study uses two measures of observed leverage to proxy capital structure. The first, is Long term Debt Ratio (LDR) (defined as long term debts divide by total assets) and the second, Total Debt Ratio (LDR) (total debts divide by total assets). Inclusion of firms specific variables were justified on the ground that the size of the firm may influence its profitability sine large firms enjoy economies of scale(Kodongo, Mokoaleli-mokoteli, & Maina, 2015). Akintoye (2009) emphasizes that asset firms with most of their investments as tangible assets will have less risk of financial distress than those who rely on intangible asset. Asset tangibility was proxied as a ratio of fixed assets to total assets. Finally growth was proxied by the rate of GDP growth. It is also noted that tax effects the relationship between capital structure and performance(Hutten, 2014). However, during the study period, Kenya did not have a change on corporate tax laws hence it was excluded from the analysis.

Financial performance was measured in terms of return on equity and return on assets. Each variable of the financial performance was applied in the regression model to show the role of observed leverage on firm's financial performance. These measurements of financial performance are consistent with studies done by Abor & Biekpe (2007) on "Corporate governance, ownership structure and performance of SMEs in Ghana: implications for financing opportunities", Antwi, Fiifi, Atta, Polytechnic, & Kf (2012) studying "Capital structure and firm value : Empirical evidence from Ghana" and Kodongo, Mokoaleli-mokoteli, & Maina (2015) in their study on " Capital Structure , profitability and firm value : Panel evidence of listed firms in Kenya".

The relationship between observed leverage and financial performance of firm *(i)* in time *(t)* is shown as;

$$Y_{it} = \alpha + \delta Z_{it} + \boldsymbol{\theta}'\boldsymbol{x} + \mu_{it} + \varepsilon_{it} \qquad i = 1, \dots, N;\ \ t = 1 \dots, T \quad \text{.....Equation 1}$$

Whereα, δ and $\boldsymbol{\theta}'$ are coefficients to be estimated; Y is the measure of financial performance metric (Return on equity and return on asset). Z Is long-term debt and total-debt measures of leverage. $\boldsymbol{x}$ Is a vector of control variables, consisting of several factors traditionally believed to determine firm performance. μ_{it} is the time-invariant company-specific effects, account for unobserved heterogeneity among individual companies in the sample while ε_{it} is the random error term.

Equation 1 was estimated as a fixed effect model (FEM) and then as a random effect model (REM). Both the fixed effect model and the random effect model have been criticized on econometric grounds. Given these criticisms, Hausman tests was conducted to determine whether to uses fixed effect model or random effect model. When the individual effect is correlated with regressors in the model, it confirms that fixed effect model is consistent and random effect model inconsistent. On the other hand, if the individual effects are not correlated with the other regressors in the model, both random and fixed effects are consistent and random effects is efficient (Lambrinoudakis, 2016).

Findings

To clearly show the characteristics of the firms listed at the Nairobi Securities Exchange between the years 2006-2015, a summary of the mean, standard deviation, minimum and maximum values of the variables were derived. This was presented in form of a table for the 35 non-financial firms selected. This was based

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on the continuous data available for the firms for the period of 10 years. The missing values for the sampled firms were selected as zero to avoid losing many observations.

Notably the mean value of profit as captured by returns on equity and returns on asset is approximately 13 percent and 7 percent respectively with a standard deviation of 39.3% and 1.5 respectively. The maximum value of return on asset (ROA) and return on equity (ROE) for the firm listed at the NSE was 2.64% and 0.60 % respectively. In addition, the respective minimum values were -3.13% and -1.41 %. Growth of firms has a large variation ranging from -14.5 to 49 percent during the period with a mean value of 2.64 % and a standard deviation of 4.7%. Notably leverage was measured using total debt ratio (TDR) and long-term debt ratio (LDR). The mean value for leverage was -0.11 and 0.16 percent respectively showing that most firms were leveraged. In addition, the variability of leverage ranged between 0 and 0.64 percent for TDR and -0.75 and 0.49 percent respectively for LDR. Their respective standard deviation was 0.25 and 0.14 percent respectively. Asset tangibility had a mean value of 0.55 % with a standard deviation of 0.25. This is followed by a minimum value of 0% and a maximum value of 0.97%. Further the results show that the mean value of size of the firm was 14.9% with a standard deviation of 3.45 % while the minimum and the maximum values ranged between 0 -19.3%.

About 54.6% of the assets are tangible confirming with findings of Hovakimian & Li (2012), Mule & Mukras (2015) & Zhang (2013) that asset tangibility as a firm characteristic is a key determinant of target leverage. This further confirms that firms listed at the NSE are in a position to provide large proportion of collateral hence reducing agency cost of debt (Nunkoo & Boateng, 2015). The average size of the sampled firms was 14.9 % with a standard deviation of 3.45. The firms also recorded an average growth of 2.64 and a variability of ranging from -14.4% to 49.23%.

From the results in table 1, it can be deduced that shareholders of the firms listed at the Nairobi Securities Exchange get 13.4% return on their investments and consequently Ksh. 13.4 for every Ksh 100 invested within the same period. This value compares to with other studies like (Maniagi *et al*., 2013) obtaining an average of 14 % and (Mule & Mukras, 2015) who obtained 16.5%. In regards to ROA, the average of 7% is in tandem with studies done by Mule & Mukras (2015). This means that firms listed at the NSE earn Ksh. 7 for every Ksh 100 they own in their business.

The leverage ratios of firm listed at the NSE ranges from -0.11 for LDR to 0.16 for TDR. This shows lack of enthusiasm by the firms to use debt financing hence prefer financing their long-term activities using other methods such as equity and retained earnings due to either lack of dynamic long-term sources of finance in the capital market (Drobetz & Wanzenried, 2015). This is differs with financial leverage obtained by firms in developed countries as evidenced by (Abdeljawad, Nor, Ibrahim, & Abdul, 2013; Flannery & Flannery, 2015; Getzmann & Lang, 2010; Haas & Peeters, 2006) who had financial leverage as 26%, 24% and 28% respectively.

Table 1: Descriptive Statistics for Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
roe	350	.1336515	.3929558	-3.134768	2.642028
roa	350	.0692723	.1251713	-1.415757	.6049132
LDR	350	-.1130937	.2549715	-.7478603	.4920091
TDR	350	.1614575	.1421009	0	.6480098
ASSET	350	.5469094	.2529257	0	.9747622
size	350	14.9035	3.453237	0	19.33779
growth	350	2.646802	4.702229	-14.46023	49.24825

Pairwise Correlation Matrix between Variables

Table 2 shows that there exist a positive relationship between leverage (LDR & TDR) and asset tangibility as well as firm's growth. However, the results shows a negative relationship between leverage and

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profitability measures (ROA &ROE) as well as the size of the firm. These results are consistent with (Abdeljawad et al., 2013; Flannery & Flannery, 2015; Getzmann & Lang, 2010; Haas & Peeters, 2006) and indicate that firm characteristics are appropriate to model for target leverage level. When the correlation values are not close to 1 or -1, it's a clear indication that the variables are not multicollinear (Farndale, Hope-Hailey & Kelliher, 2010). Therefore, in this study the analysis as indicated in table 2 showed that the correlation coefficient between explanatory variables are relatively low hence multicollinearity is not a major concern in estimations.

Table 1: Correlation Matrix

```
. pwcorr roe roa LDR TDR ASSET growth SIZED, sig star(5)
```

	roe	roa	LDR	TDR	ASSET	growth	SIZED
roe	1.0000						
roa	0.6794*	1.0000					
	0.0000						
LDR	0.0671	0.0183	1.0000				
	0.2104	0.7336					
TDR	-0.0499	-0.1024	0.7061*	1.0000			
	0.3521	0.0556	0.0000				
ASSET	-0.0768	-0.0737	0.5646*	0.5741*	1.0000		
	0.1516	0.1687	0.0000	0.0000			
growth	0.3247*	0.1556*	0.0446	0.1026	-0.0081	1.0000	
	0.0000	0.0035	0.4052	0.0552	0.8793		
SIZED	-0.1330*	0.0932	-0.0708	0.0159	0.0117	-0.0413	1.0000
	0.0182	0.0985	0.2098	0.7788	0.8364	0.4653	

Panel Unit Root Tests

Before empirical estimations were conducted, the data was subjected to unit root analysis to test its stationarity and avoid spurious regression estimates using methods proposed by Levin lin- chu- (2002) and Im Pesaran Shin (2003). These tests indicates that null hypothesis of all panels have a unit root while the alternate hypothesis has that all panels are stationary. Where a series of data was found non- stationary, it was differenced further until it became stationary (Gujarati, 2007). In regards to unit-root test for ROE, table 3 shows that Levin Lin Chu null hypothesis of ROE panel contain unit root but the P-value is 0.0027, which is statistically significant hence rejecting the null hypothesis. The results of Levin Lin Chu test were in tandem with, Im- Pesaran- Shin test in table 4 that all panels are stationary at levels with a P-value of 0.0002. Both tests indicate that the ROE is stationary at all levels with P values are less than 0.1, 0.05, 0.01. This is in tandem with studies of Haas & Peeters (2006) in their study on "Dynamic adjustment towards target capital structure of tranisition economies" and Nunkoo & Boateng (2015) in their study on "Empirical determinants of target capital structure and adjustment to long-run target: evidence from Canadian firms". This therefore, means that panel data for ROE was appropriate to measure for financial performance.

To test stationarity for ROA, table 6 shows that using Levin Lin Chu test, the P value is 0.12 which is greater than 0.1 hence the data is not stationary. Levin–Lin–Chu test requires that the ratio of the number of panels to time periods tend to zero asymptotically, it is not well suited to datasets with a large number of panels and relatively shorter periods. Therefore, the data was further subjected to Im- Pesaran- Shin and Harris–Tzavalis test. Table 7 confirms that data was stationary with a P value of 0.0017 using Im- Pesaran-Shin. In addition, table 8 shows Harris–Tzavalis test, which assumes that the number of panels tends to infinity while the number of periods is fixed. This confirmed the panels were stationary. Baum & Christopher

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(2013) justifies the need to conduct further unit-root tests where the Levin- Lin-Chu tests rejects null hypothesis. This results agrees with the test results for Lambrinoudakis (2016) in his study on " Adjustment cost determinants and target capital structure" and Hovakimian & Li (2012) on their study on "Is the partial adjustment model a useful tool for capital structure research?". This therefore, concludes that ROA panel data is stationary and can be used as a measure of performance.

In regards to Long-term debt ratio, table 9 & 10 stationarity test was conducted using both the Levin Lin Chu and Im- Pesaran- Shin tests .This was done on the assumption of existence of unit root (H_0) against the alternate hypothesis (H_1) that the variable is stationary and does not contain a unit root. The summary of the results rejects the null hypothesis that the panels contain unit roots with P values of 0 and 0.0012 for Levin Lin Chu and Im- Pesaran- Shin tests respectively. This concluded that the panels were stationary. This agrees with Abdeljawad, Nor, Ibrahim, & Abdul (2013) findings on "Dynamic capital structure trade-off theory : Evidence from Malaysia"

Table 11 &12 confirms that Levin Lin Chu test for TDR is stationary at all levels while Im- Pesaran- Shin tests for LDR is stationary at 10%. Both Levin Lin Chu and Im- Pesaran- Shin tests for asset tangibility in table 13 & 14 confirms that the panels are stationary at all levels and at 10 % respectively. Both Levin Lin Chu and Im- Pesaran- Shin tests for size in table 15 & 16 confirms that the panels are not stationary since the P values were 1 and 0.85 respectively. The panels were further differenced and the panels were stationary at all levels.

Both Levin Lin Chu and Im- Pesaran- Shin tests for growth in table 17 & 18 confirms that the panels are stationary at all levels and at 10 % respectively. The study concluded that for all variables the null hypothesis of unit root is strongly rejected at 10%. This findings are supported by (Buvanendra, Sridharan, & Thiyagarajan, 2017; Sulgana, 2010; Drobetz and Wanzenried, 2006; Mahakud and Mukherjee, 2011).

Table 3: Levin- Lin and Chu Unit-Root Test for ROE

```
. xtunitroot llc roe

Levin-Lin-Chu unit-root test for roe
------------------------------------

Ho: Panels contain unit roots                   Number of panels   =      35
Ha: Panels are stationary                       Number of periods  =      10

AR parameter: Common                            Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 6.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic       p-value
------------------------------------------------------------------------------
 Unadjusted t        -10.2395
 Adjusted t*          -2.7782         0.0027
------------------------------------------------------------------------------
```


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Table 2: Im- Pesaran- Shin Unit-Root Test for ROE

```
Im-Pesaran-Shin unit-root test for roe
```

Ho: All panels contain unit roots — Number of panels = 35
Ha: Some panels are stationary — Number of periods = 10

AR parameter: Panel-specific — Asymptotics: T,N -> Infinity sequentially
Panel means: Included
Time trend: Not included

ADF regressions: No lags included

	Statistic	p-value	Fixed-N exact critical values 1%	5%	10%
t-bar	-2.2198		-1.850	-1.750	-1.700
t-tilde-bar	-1.7139				
Z-t-tilde-bar	-3.6057	0.0002			

Table 3: Levin- Lin and Chu Unit- Root Test for ROA

```
. xtunitroot llc roa

Levin-Lin-Chu unit-root test for roa
```

Ho: Panels contain unit roots — Number of panels = 35
Ha: Panels are stationary — Number of periods = 10

AR parameter: Common — Asymptotics: N/T -> 0
Panel means: Included
Time trend: Not included

ADF regressions: 1 lag
LR variance: Bartlett kernel, 6.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-9.3667	
Adjusted t*	-1.1746	0.1201

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Table 4: Im- Pesaran- Shin Unit-Root Test for ROA

```
Im-Pesaran-Shin unit-root test for roa
------------------------------------------

Ho: All panels contain unit roots           Number of panels  =     35
Ha: Some panels are stationary              Number of periods =     10

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Not included

ADF regressions: No lags included
```

	Statistic	p-value	Fixed-N exact critical values 1%	5%	10%
t-bar	-2.0382		-1.850	-1.750	-1.700
t-tilde-bar	-1.6324				
Z-t-tilde-bar	-2.9378	0.0017			

Table 5: Harris-Travalis Unit-Root Test for ROA

```
. xtunitroot ht roa

Harris-Tzavalis unit-root test for roa
------------------------------------------

Ho: Panels contain unit roots               Number of panels  =     35
Ha: Panels are stationary                   Number of periods =     10

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Not included
```

	Statistic	z	p-value
rho	0.3679	-7.7136	0.0000

Table 6: Levin- Lin and Chu Unit- Root Test for LDR

```
Levin-Lin-Chu unit-root test for LDR
---------------------------------------

Ho: Panels contain unit roots               Number of panels  =     35
Ha: Panels are stationary                   Number of periods =     10

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 6.00 lags average (chosen by LLC)
```

	Statistic	p-value
Unadjusted t	-11.5094	
Adjusted t*	-4.8075	0.0000

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Table 7: Im- Pesaran- Shin Unit-Root Test for LDR

```
. xtunitroot ips LDR

Im-Pesaran-Shin unit-root test for LDR
--------------------------------------

Ho: All panels contain unit roots           Number of panels  =      35
Ha: Some panels are stationary              Number of periods =      10

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                                 Fixed-N exact critical values
                     Statistic      p-value         1%       5%       10%
------------------------------------------------------------------------------
 t-bar                -2.1209                     -1.850   -1.750   -1.700
 t-tilde-bar          -1.6429
 Z-t-tilde-bar        -3.0237        0.0012
------------------------------------------------------------------------------
```

Table 8: Levin- Lin and Chu Unit- Root Test for TDR

```
. xtunitroot llc TDR

Levin-Lin-Chu unit-root test for TDR
------------------------------------

Ho: Panels contain unit roots               Number of panels  =      35
Ha: Panels are stationary                   Number of periods =      10

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 6.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -10.7934
 Adjusted t*          -5.9409        0.0000
------------------------------------------------------------------------------
```

Table 9: Im- Pesaran- Shin Unit-Root Test for TDR

```
. xtunitroot ips TDR

Im-Pesaran-Shin unit-root test for TDR
--------------------------------------

Ho: All panels contain unit roots           Number of panels  =      35
Ha: Some panels are stationary              Number of periods =      10

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                                 Fixed-N exact critical values
                     Statistic      p-value         1%       5%       10%
------------------------------------------------------------------------------
 t-bar                -1.7870                     -1.850   -1.750   -1.700
 t-tilde-bar          -1.4689
 Z-t-tilde-bar        -1.5976        0.0551
------------------------------------------------------------------------------
```


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Table 10: Levin- Lin and Chu Unit- Root Test for Asset Tangibility

```
. xtunitroot llc ASSET

Levin-Lin-Chu unit-root test for ASSET
---------------------------------------

Ho: Panels contain unit roots                   Number of panels  =      35
Ha: Panels are stationary                       Number of periods =      10

AR parameter: Common                            Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 6.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -11.6923
 Adjusted t*          -6.9411        0.0000
------------------------------------------------------------------------------
```

Table 11: Im- Pesaran- Shin Unit-Root Test for Asset Tangibility

```
. xtunitroot ips ASSET

Im-Pesaran-Shin unit-root test for ASSET
-----------------------------------------

Ho: All panels contain unit roots               Number of panels  =      35
Ha: Some panels are stationary                  Number of periods =      10

AR parameter: Panel-specific                    Asymptotics: T,N -> Infinity
Panel means:  Included                                       sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                                 Fixed-N exact critical values
                     Statistic      p-value         1%       5%       10%
------------------------------------------------------------------------------
 t-bar                -2.3569                     -1.850   -1.750   -1.700
 t-tilde-bar          -1.5045
 Z-t-tilde-bar        -1.8894        0.0294
------------------------------------------------------------------------------
```

Table 12: Levin- Lin and Chu Unit- Root Test for Size

```
. xtunitroot llc size

Levin-Lin-Chu unit-root test for size
--------------------------------------

Ho: Panels contain unit roots                   Number of panels  =      35
Ha: Panels are stationary                       Number of periods =      10

AR parameter: Common                            Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 6.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t         -5.8156
 Adjusted t*           4.3884        1.0000
------------------------------------------------------------------------------
```


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Table 13: Im- Pesaran- Shin Unit-Root Test for Size

```
. xtunitroot ips size

Im-Pesaran-Shin unit-root test for size
------------------------------------------

Ho: All panels contain unit roots            Number of panels  =      35
Ha: Some panels are stationary               Number of periods =      10

AR parameter: Panel-specific                 Asymptotics: T,N -> Infinity
Panel means:  Included                                    sequentially
Time trend:   Not included

ADF regressions: No lags included
```

			Fixed-N exact critical values		
	Statistic	p-value	1%	5%	10%
t-bar	-6.1326		-1.850	-1.750	-1.700
t-tilde-bar	-1.1465				
Z-t-tilde-bar	1.0454	0.8521			

Table 14: Differenced Im- Pesaran- Shin Unit-Root Test for Size

```
. xtunitroot ips SIZED

Im-Pesaran-Shin unit-root test for SIZED
-------------------------------------------

Ho: All panels contain unit roots            Number of panels  =      35
Ha: Some panels are stationary               Number of periods =       9

AR parameter: Panel-specific                 Asymptotics: T,N -> Infinity
Panel means:  Included                                    sequentially
Time trend:   Not included

ADF regressions: No lags included
```

			Fixed-N exact critical values		
	Statistic	p-value	1%	5%	10%
t-bar	-9.0444		-1.850	-1.750	-1.700
t-tilde-bar	-2.0188				
Z-t-tilde-bar	-6.3144	0.0000			

Table 15: Levin- Lin and Chu Unit- Root Test for Growth

```
. xtunitroot llc growth

Levin-Lin-Chu unit-root test for growth
------------------------------------------

Ho: Panels contain unit roots                Number of panels  =      35
Ha: Panels are stationary                    Number of periods =      10

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 6.00 lags average (chosen by LLC)
```

	Statistic	p-value
Unadjusted t	-19.4316	
Adjusted t*	-16.8021	0.0000

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Table 16: Im- Pesaran- Shin Unit-Root Test for Growth

```
. xtunitroot ips growth

Im-Pesaran-Shin unit-root test for growth
```

Ho: All panels contain unit roots		Number of panels	= 35
Ha: Some panels are stationary		Number of periods	= 10
AR parameter: Panel-specific		Asymptotics: T,N -> Infinity	
Panel means: Included			sequentially
Time trend: Not included			

ADF regressions: No lags included

			Fixed-N exact critical values		
	Statistic	p-value	1%	5%	10%
t-bar	-1.8309		-1.850	-1.750	-1.700
t-tilde-bar	-1.4491				
Z-t-tilde-bar	-1.4353	0.0756			

The objective of this study was to determine the role of observed leverage on financial performance of listed firms at the NSE.

The hypothesis test for this objective was:

$H_{o\,(1)}$: Observed leverage has no role on financial performance of listed firms in NSE, Kenya.

Before the hypothesis was tested, the model was estimated as a Fixed Effect Model or Random Effect Model for econometric soundness. In table 2, the Hausman test aimed at determining whether to uses fixed effect model or random effect model when ROE is the dependent variable. The null hypothesis for this test was that random effect model is appropriate if the Pvalue> 0.05 while the alternate hypothesis test was that the fixed effect model was appropriate when Pvalue< 0.05. The test results showed that the Pvalue was 0.337 hence indicating use of random effects model

Table 17: Hausman Fixed & Random Effect for ROE

```
. hausman fixed random
```

	Coefficients			
	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
LDR	.5595357	.398821	.1607147	.1341951
TDR	-.9627276	-.6903886	-.2723391	.2118831

```
                b = consistent under Ho and Ha; obtained from xtreg
     B = inconsistent under Ha, efficient under Ho; obtained from xtreg

  Test:  Ho:  difference in coefficients not systematic

                chi2(2) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                        =         2.18
              Prob>chi2 =       0.3370

.
```

To determine whether to use fixed or random model when the dependent variable was ROA, the study tested the null hypothesis: random effect model is appropriate if the Pvalue> 0.05 while the alternate hypothesis: fixed effect model was appropriate when Pvalue< 0.05. Hausman tests in table 20 confirmed the use of random effects model since the Pvalue was 0.1644. This allowed for the first regression equation between the observed leverage financial performance metric (ROA).

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Table 18: Hausman Fixed & Random Effect for ROA

```
. hausman fixed random

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |    fixed        random       Difference          S.E.
-------------+------------------------------------------------------------
         LDR |   .0370252     .0618778       -.0248526        .0390124
         TDR |  -.0024035    -.1182185         .115815        .0611105
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(2) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =         3.61
                Prob>chi2 =       0.1644
```

With the Hausman tests conducted and confirming the use of Random Effect Model while using ROA and ROE as financial performance measures, the study sought to test the null hypothesis that there is no relationship between observed leverage and financial performance. The regression results in table 21 showed that observed leverage measured by (LDR) had a positive coefficient of 0.3966 and significantly affecting performance (ROE) at 1% level of significance. However, the leverage measure using TDR showed a negative and significant effect on performance with coefficient of 0.69 at the same level of significance. This means that a unit increase in LDR increases performance (ROE) by 0.3966 while a unit increase in TDR reduce performance (ROE) with 0.6904 units. The positive and significant relationship between LDR as a measure of observed leverage and ROE as a measure of performance agrees with the agency and signaling theories of capital structure This further is consistent with studies done by Igbinosa (2015), Kajananthan & Nimalthasan(2013), Kodongo, Makoteli & Maina (2015), Mule & Mukras (2015) (Mwangi, Anyango & Amenya, 2012) whose results found a positive relationship between long-term debt and financial performance. However, contradicting results have been reported in studies by (Bauer, 2004; Deesomsak, Paudyal & Pescetto, 2004; Zeitun & Tian, 2007). This results shows that firms listed at the Nairobi Securities Exchange use long-term debts, which contributes positively to their profitability.

In regards to relationship between observed leverage and ROA, table 22 shows that LDR is positively related to ROA with a coefficient of 0.0619 although significant at 10% level. This means that a unit increase of observed leverage measured by LDR increases performance (ROE) with 0.0619 units. This confirms the agency cost theory of capital structure by Jensen and Meclick (1976) that increase in debt to equity increase the firm's performance. This is in tandem with studies of (Antwi, Fiifi, Atta, Polytechnic & Kf, 2012; Cheng, Liu, & Chien , 2010; Otieno & Commerce, 2015; Rayan, 2008; Salim & Yadav, 2012). On the other hand, TDR as proxy of observed leverage shows a negative relationship with ROA. This means that a unit increase in TDR reduces financial performance (ROA) by 0.12 units of listed firms at the NSE. This agrees with studies like (Kodongo, Makoteli & Maina, 2015) who concluded that using high debts for firms listed at the NSE reduces their performance.

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Table 19: Observed Leverage and ROE

```
. xtreg roe LDR TDR, re

Random-effects GLS regression                   Number of obs      =       350
Group variable: countryid                       Number of groups   =        35

R-sq:                                           Obs per group:
     within  = 0.0339                                         min =        10
     between = 0.0225                                         avg =      10.0
     overall = 0.0234                                         max =        10

                                                Wald chi2(2)       =      9.55
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0084
```

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
LDR	.398821	.1401846	2.84	0.004	.1240642	.6735777
TDR	-.6903886	.2470918	-2.79	0.005	-1.17468	-.2060975
_cons	.290224	.0602679	4.82	0.000	.172101	.408347
sigma_u	.14086167					
sigma_e	.36449139					
rho	.12994454	(fraction of variance due to u_i)				

Table 20: Observed Leverage and ROA

```
. xtreg roa LDR TDR, re

Random-effects GLS regression                   Number of obs      =       350
Group variable: countryid                       Number of groups   =        35

R-sq:                                           Obs per group:
     within  = 0.0003                                         min =        10
     between = 0.1348                                         avg =      10.0
     overall = 0.0257                                         max =        10

                                                Wald chi2(2)       =      2.45
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.2938
```

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
LDR	.0618778	.0456017	1.36	0.175	-.0274999	.1512554
TDR	-.1182185	.0799846	-1.48	0.139	-.2749853	.0385484
_cons	.0953575	.0198539	4.80	0.000	.0564446	.1342704
sigma_u	.05183482					
sigma_e	.11271644					
rho	.17456315	(fraction of variance due to u_i)				

```
.
```

Conclusion

The study found a positive role of long-term debt ratio on financial performance measured by ROA and ROE. However total debt ratio had a negative role on financial performance metrics (ROA &ROE). This means that the more firms listed at the Nairobi Securities Exchange borrow, the more profits they earn. Available information shows that 68 Treasury bonds issued by the Republic of Kenya, 10 corporate bonds issued by seven companies and 60 companies' equities were listed on the Nairobi Securities Exchange, Kenya, as of December 2012. This shows that long-term financing through bonds has become more prevalent in the study period hence leading to better performance. However, the negative effect of TDR on performance metrics can only conclude that financing through short-term cause the negative impact on

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firm's performance. The short-term financing are more expensive within the study period causing a negative effect on financial performance.

Since Modigliani and Miller theory of capital structure, conflicting findings have emerged from various researchers regarding capital structure and financial performance (Mule & Mukras, 2015). Some have found a positive relationship, others negative relationship between observed advantage and financial performance. Maghanga and Kalio (2012), Raza (2013), Enekwe, Agu & Eziedo (2014), Gweyi and Karanja (2014) among others supports the positive relationship between observed leverage and financial performance. On the other hand researchers who found negative results include (Akhtar, 2012; Hutten, 2014; Ismail, 2016; Rehman, 2013).

From the findings of this study, it's imperative for firms to select the best financing option in order to make profits. In Kenya, firms should pursue usage of long-term debts, precisely bonds and avoid use of short-term debts that appear more expensive. Though the debt market in Kenya is not fully grown, this study suggests that the Capital Market Authority should embark in ensuring the derivative market in Kenya is developed so as to increase access to alternative way of financing. In addition, the government through the Central Bank of Kenya, should regulate the borrowing rates so as to make borrowings easily accessible to firms.

Future research should focus on the best combination of debt and equity that listed firms should embrace to maximize the shareholders wealth.

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