THE RELATIONSHIP BETWEEN CAPITAL STRUCTURE AND FINANCIAL PERFORMANCE OF FIRMS LISTED ON THE NAIROBI SECURITIES EXCHANGE

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Abstract

Until now, researchers are not in consensus, whether it is the capital structure that influences performance or performance that influences capital structure or both. The main objective of this study was to establish the relationship between capital structure and financial performance of firms listed on the NSE by employing a generalised linear model (GLM) as an improvement on ordinary least regression (OLS). The results of the study revealed that efficient and profitable firms employ more debt than comparable firms that are less profitable possibly because profitable firms' exposure to financial risk is low. There results also indicate that firms that use more debt outperformed those that use less debt.

Keyterms: Capital Structure; Financial Performance; General Linear Model; Ordinary Least Regression; NSE

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1 Introduction

Research in finance discipline has a history of examining capital structure choices and linking debt capital to level of firm performance. The decision on the amount of debt that a firm uses to finance its assets and activities is a managerial decision. However, in modern corporations, managers are separated from owners, an arrangement that results into agency costs (Hannah, 2007; Jensen and Meckling, 1976). It is then hypothesised that managers who are not owners might not be as committed as owners would want them to be (Crawford, 2007; Mark, 2004; Jensen and Meckling, 1976; Berle and Means 1932). The challenge then is to come up with organization structures that inspire managers to maximise the value to the shareholders of the firm. However, agency model could have a positive or negative impact on firm performance, and like in any model, the justification lie on whether the benefits exceed the costs of the models (Dobbin and Jung, 2010).

The link between agency cost i.e. managerial choices and impact of those choices on performance is critical to current and potential investors to discourage investors from investing in awfully governed firms (Giannetti and Simonov, 2006). Intuitively investors will ignore poorly managed firms within adequate returns, unless they can turn them around (Christian, Karl and Francis, 2009). In addition, the economy as a whole benefit from well managed micro units, in line with the structure-conduct-performance approach which states that industry's performance and by extension, the economy depends upon the conduct of firms within the economy (Edwards**,** Allen and Shaik 2009; Carlton and Perloff, 2004; Scherer and Ross, 1990**).** Therefore, there is a need for a model that reconciles managers and shareholder's interests in a corporation in the area of financial decisions. Achieving goal congruence between managers and owners requires that managers are monitored. Manager's motivation to self-interest requires an appropriate disciplinary device and effective positive incentives.

Managers must make capital structure and profit planning decisions that add value to the shareholders. Determining the right balance between debt and equity financing means weighing the costs and benefits of debt and equity, to make sure that the firm does not have debt it cannot repay and at the same time, the combination of debt and equity should minimise the cost of capital. The proposition is that potential debtholders will invest in profitable, financially sound and growth firms such that firm performance is the key to the amount of debt capital an individual firm will employ. The other proposition is that debt capital forces

managers to manage cash flow to be able to meet the firm's debt obligations. Therefore, debt holders have the potential to play a disciplinary role, thus improving performance.

Since researchers are not in consensus whether it is the capital structure that influences performance or performance that influences capital structure or both (***Margaritis and Psillaki,*** 2010; ***Margaritis and Psillaki, 2007***). One may argue that debt capital would reduce agency costs. However, it can also induce agency benefits if there are visible differences in performance across different levels of capital structure and visible differences in capital structure across different levels of performance. Thus managers would look at performance in managing debt levels and vice versa. The resulting proposition is that capital structure decisions are relevant and not irrelevant as stated in Modigliani and Miller (M&M) (1958) On the Nairobi Securities Exchange (NSE), there are large differences in leverage ratios and the question then is, if the capital structure decision is not important, how does one explain variations in leverage ratios? This study establishes which of these possibilities prevail on the NSE.

Methodological issues arise from studies on capital structure choices. Different methodologies result into different interpretation of factors that explain capital structure decisions. Some previous studies employed statistical techniques that make it difficult to establish whether the effect of capital structure on performance responds to different capital choices, or whether the effect of performance on capital structure responds to different performance levels. Onwuegbuzie, Johnson and Coluns (2009) recommend that more than one statistical method should be used as part of a validation process to help ensure that variance explained culminates from the underlying phenomena or trait and is not afunction of method. However, of significance to managers would be whether poor performance is explained in terms of sub optimal capital structure choices or capital structure is explained in terms of level of capital structure. This require grouping of firms into levels of performance and levels of borrowing. Grouping is frequently used for inferring the association between two variables (Kutner, Nachtsheim, Neter and Li, 2005; Lys and Sabino, 1992).

The main objective of this study was to establish the relationship between capital structure and financial performance firms listed on the NSE by employing a generalised linear model (GLM) as an improvement on ordinary least regression (OLS). OLS based studies focus only on the test of significance of predictor coefficients but do not use levels of performance to predict levels of leverage and vice versa. GLM enabled the determination of the relationship between capital structure and performance by considering levels of performance and levels of capital structure. The remainder of this study is structured as follows: Firstly, a literature study presents the theoretical foundation of the relationship between capital structure and financial performance. Secondly, the sample, variables and methodology employed are outlined. Thirdly, the analysis is carried out, and lastly the results of the analysis and the recommendations are outlined.

2 Capital structure and firm performance

This study gravitated around the relevancy and irrelevancy of capital structure decisions, precisely the effect of debt capital on the value for the shareholders of the firm. O'Brien, Parthiban, Toru and Andrew (2014) observing the lack of consensus on the impact debt on firm performance stated that while agency theory predicts that debt should lead to higher performance for diversifying firms, transaction cost economics (TCE) predicts that more debt will lead to lower performance for firms expanding into new markets.

The importance of debt capital to issuing firms is debatable from the time Modigliani and Miller (1958) pointed out that in perfect markets, and based on the law of one price, capital structure does not matter because it does not add value. The law of one price implies that a good must sell for the same price in all locations (Mankiw, 2011; Lamont and Thaler, 2003), otherwise arbitrageurs will come into the market and eliminate differences in prices of identical assets. The finance manager's interpretation would be that in perfect capital markets, all financial decisions will not impact on the value of the firm, and in finality irrelevant. The then Modigliani and Miller (1958) proposition worked well with the proof that while leverage increases the risk and cost of equity, the firms weighted cost of capital (WACC) and total value are indifferent towards capital structure choices (Van Horne and Wachowicz, 2009).

However, the conclusion that a firm's choice of capital structure is inconsequential is inconsistent with the observation that firms invest significant resources both in terms of managerial time and effort, legal fee and investment banking fees, to manage their capital structures (Berk and Demazro, 2011). The main justification of the deployment of such resources is that the choice of leverage is of critical importance to a firm's value, and that individual firms have an optimum capital structure (Berk and Demazro, 2011).

Harvey, Lins and Roper (2004) study the extent debt capital mitigates agency costs to create shareholder value. Gamba and Triantis (2014) examine the effectiveness of debt covenants in alleviating financial agency problems, concluding that the presence of debt

capital and enforcement of debt covenants significantly alters dynamic financing and investment policies, and is an important element of structural models. These prescriptions define a new role for debt, and presented testable propositions.

The testable theory predicts performance as a factor in explaining the use of debt, the meaning of this is that productive and money-making firms will use more debt (Margaritis and Psilaki, 2010). It is also possible that efficient firms may use less debt to minimise their exposure to financial risk (He and Matvos, 2012). In addition, the franchise value hypothesis suggests that the more profitable and liquid the firm is, the lower the leverage (Cheng and Tzeng, 2011; Margaritisa and Psillak, 2007; Berger and Bonaccorsi, 2006). A capital structure study in Ghana reported positive associations between debt ratio (capital structure) and firm size and growth, while asset tangibility, risk, corporate tax and profitability are negatively related to the debt ratio (Abor and Biekpe, 2005). Abor, and Biekpe, (2009) report variables such as firm's age, size, asset structure, profitability, and growth as influencing the capital structure choices of small and medium enterprise (SMEs) in Ghana. Therefore, the first, second hypotheses and their alternatives of this study are stated as follows:

H_{01}: Firm performance does not have a significant effect on leverage,

H_{11}: Firm performance has a significant effect on leverage

H_{02}: Leverage does not have a significant effect on performance

H_{12}: Leverage has a significant effect on firm performance.

The first hypothesis analyses the effects of performance on capital structure taking into account two competing hypothesis (Berger and Bonaccorsi di Patti, 2006). The two competing hypotheses are profitability (return) – risk hypothesis; and franchise – value hypothesis. The profitability (return) – risk hypothesis stipulates that profitable firms have lower expected bankruptcy costs thus are able to employ more debt than comparable firms that are less profitable. While under the franchise – value hypothesis, the proposition is that profitable firm will employ less debt to protect the firm from debt induced liquidation. In the second hypothesis we assess the role of debt capital on reducing agency costs, and in so doing, improving performance (Dobbin and Jung, 2010; Christian, Karl and Francis, 2009; Zwiebel, 1996; Jensen and Meckling, 1976). If leverage mitigates agency costs, then one expects leverage to improve firm performance. It is also possible that high levels of leverage increase agency cost thus impairing firm performance.

3 Research objectives

The main objective of this study was to investigate the relationship between capital structure and financial performance of firms listed on the NSE by employing a generalised linear model (GLM) as an improvement on ordinary least regression (OLS).

4 Research methodology

4.1 Data collection

The population of the study consisted of all companies listed on the NSE during the period 1990 to 2012. Due to their unique capital structure, firms classified as financial institutions were left out, leaving a sample of 37 firms. The study relied on secondary data extracted from the annual reports supplied firms listed on the NSE. Share price listings were found at NSE and Capital Markets Authority (CMA). The study employed panel data, i.e., instead of a firm being a unit of observation, firm and each firm year became an observation as was in Faleye, Hoitash and Hoitash (2011). The comfort in extracting information from annual reports is that they are subjected to an audit by reputable audit firms, while the comfort in using market data is that such data is on public domain and is subjected to public scrutiny. However, where returns per share are to be calculated, they were adjusted for dividends paid, share splits and right issues.

4.2 Definition of variables and hypotheses

The variables used in this study to measure capital structure and performance were identified by making use of canonical correlation, and reject return of assets (ROA) as a performance indicator. The variables used as indicators of performance are book value to market value and asset turnover, and total debt to total asset as an indicator of capital structure or leverage.

The GLM procedure is used to provide regression analysis and analysis of variance for level measured variables (Rutherford, 2011). In the first hypothesis the GLM is used to test the null hypothesis about the effect of performance and ownership structure on the means of different groupings of the debt ratio. In the second hypothesis the GLM is used to test the hypothesis regarding the effect of capital structure and ownership structure on the means of various groupings of performance. Furthermore, the GLM is used to establish the interaction between independent variables. In this GLM model, the dependent variable which could be an indicator of capital structure or performance,

depending on hypothesis being tested, is a covariate, but the independent variables can be any level that defines groups; that is, dichotomous, nominal, ordinal, or grouped interval. In this study, all independent variables are grouped variables (Rutherford, 2011).

5 Results and findings

5.1 Descriptive statistics of grouped performance and capital structure indicators

The information in Table 1 confirmed the adequacy of the sample size, the larger the sample size, the better for GLM. The large numbers of cases within each category of the independent variable ensure a reasonably stable mean for each cell when analysing observational data. The book value to the market value ratio is interpreted in terms of positive growth, no growth, and negative growth. A book value to market value of less than one means the market value is greater than one and indicates growth in a firm share. A book value to market value of less than one is interpreted as a decline in growth and a book value to market value of less than one is interpreted as a positive in growth. From 851 cases, a total of 708 cases are included for the analysis. Therefore, a total of 510 cases had no growth and negative growth. However, the average growth factor (positive growth stocks), (book to market value is 0.252) is a high 3.968 or 397 percent.

Table 1. Descriptive statistics of grouped performance and capital structure indicators

	Mean	**StDev**	**Number**
		.	
Level of Book to Market Ratio			
Positive Growth <1	0.252	0.221	198
No Growth =1	0.931	0.280	288
Negative Growth > 1	3.995	4.913	222
Total	1.702	3.174	708
Ownership Structure			
Shareholdings 20percent to 50percent	34.409	8.772	276
Shareholdings 51percent to 100percent	64.434	11.373	437
Shareholdings Below 20percent	14.821	2.523	15
Total	52.029	18.594	728
Total Debt to Total Assets			
High Debt ratio 0.45 to 2.03956	0.675	0.226	257
Medium Debt ratio 0.3515 to 0.44781	0.399	0.027	125
Low Debt ratio 0 to 0.34278	0.196	0.091	326
Total	0.406	0.263	708
Lev Asset Turnover Ratio			
Low 0.073 - 0.6882	0.4545	0.1513	234
Medium 0.6926 - 1.1073	0.8917	0.1192	234
High 1.114 - 10.1856	2.0581	1.0653	232
Total	1.1321	0.9192	700

Ownership structure in this study captures the percentage of shares held by top shareholders, in each firm over the period 1990 to 2012. There is evidence of concentrated ownership in the firms, that is, 437 cases out of 728 cases over 23 years, show shareholding of over 51 percent. This gives such a single shareholder an absolute control and is evidence of absence of dispersed ownership. The concentration of ownership is confirmed by the structure of ownership where only 15 cases show the ownership below 20 percent and that the average shareholding is 52.029 percent.

Capital structure (the total debt to the total asset ratio), has three measurement levels, high debt ratio ranging from 0.45 to 2.03956, with a mean of 0.675 and a standard deviation of 0.226, relating to 257 cases out of 708 cases; medium debt ratio ranging from 0.3515 to 0.44781, with a mean of 0. 399 and a standard deviation of 0.027, relating to 125 cases out of 708 cases; and low debt ratio ranging from 0 to 0.34278, with a mean of 0.196 and a standard deviation of 0.091, relating to 326 cases out of a 708 cases.

The standard deviation shows that the level of dispersion of grouped levels is highest for a high debt

ratio, that is, firms classified as using substantial amounts of debt to finance their total assets. The mean of the levels is different from a high 0.675 to 0.399 and 0.196 for high, medium, and low use of debt respectively. On average, the firms listed on the NSE use 40.565 percent debt capital to finance their assets. However, the standard deviation of 26.257 percent shows substantial variation in the use of debt by firms' overtime. The debt to the asset ratio of greater than 0.5 indicates that equity position by owners is less than 50 percent, while a debt ratio of one or more mean that the firm is technically insolvent and there were few such cases.

The asset turnover indicates the rate at which a firm generates the turnover (sales) from asset base. To group the cases, the indicators are ranked and divided into three equal groups, and this explains why there are almost 234 cases within each group. The average asset turnover ratio is 1.132. From canonical analysis this ratio emerges as a superior indicator of performance in building a relationship between performance and capital structure.

5.2 Influence of book value to market value on the total debt to total assets ratio

The question that arises is, "Does the book value to market value (performance) have an impact on the total debt to the total asset ratio - capital structure?" The test is whether the average of the total debt to the total asset ratio, between the growth firms (the book value to the market value ratio < 1), no-growth firms (the book value to the market value ratio = 1), and negative growth firms (the book value to the market value ratio >1) are significantly (statistically) different. Table 2 provides statistics for each combination of factors in the model, performance (book to market ratio) and ownership structure (shareholdings). The N column in Table 2 shows that there are unequal cell sizes. Over the year majority of firms offered is either zero growths (288) or no growth (222), with those with growth totaling 198. The standard deviation does not appear homogenous if we take interaction into account.

The result shows that firms with positive growth, (where market values exceed book value) on average financed 43.6 percent of their assets with debt capital; no-growth firms on average financed 39.55 percent of their assets with debt capital; and negative growth firms on average use the least amount, financed 39.16 percent of their assets with debt. There appears to be no performance effect on capital structure because for each class of performance, the debt usage is approximately 40 percent (positive g <1 = 43.608 percent; no-growth percent; and negative g > 1 = 39.163 percent).

Table 2. Performance (Book to Market Ratio) on capital structure - dependent variable: Total debt to total assets

Categorised Ownership Structure	Level of Book Value to Market Value Ratio	Mean	Std. Deviation	N
Shareholdings 20 percent to 50 percent	Positive Growth <1	0.41626	0.210122	75
	No Growth =1	0.36274	0.268151	129
	Negative Growth > 1	0.32865	0.319771	69
	Total	0.36883	0.269185	273
Shareholdings 51 percent to 100 percent	Positive Growth <1	0.45341	0.320123	113
	No Growth =1	0.42027	0.223603	154
	Negative Growth > 1	0.42004	0.231942	153
	Total	0.42910	0.255703	420
Shareholdings Below 20 percent	Positive Growth <1	0.38884	0.331983	10
	No Growth =1	0.47985	0.060441	5
	Total	0.41918	0.271785	15
Total	Positive Growth <1	0.43608	0.283402	198
	No Growth =1	0.39553	0.244356	288
	Negative Growth > 1	0.39163	0.265067	222
	Total	0.40565	0.262571	708

From table 2 it is observed that firms in which the largest shareholder held 20 percent to 50 percent of the share capital on average financed 36.88 percent of their assets with debt capital, and firms in which the largest shareholder held more than 51 percent (51 percent to 100 percent) of the share capital on average financed 42.91 percent of their assets with debt capital. Firms in which the largest shareholder held below 20 percent of the share capital on average financed 41.92 percent of their assets with debt capital.

Firms in which the largest shareholder held 20 percent to 50 percent of the share capital coupled with a positive growth on average financed 41.63 percent of their assets with debt capital, firms in which the largest shareholder held below 20 percent of the share capital coupled with positive growth on average financed 38.88 percent of their assets with debt capital. Firms in which the largest shareholder held more than 51 (51 percent to 100 percent) of the share capital coupled with positive growth financed 45.34 percent of their assets with debt capital.

Firms in which the largest shareholder held 20 percent to 50 percent of the share capital coupled with no-growth financed 36.274 percent of their assets with debt capital, firms in which the largest shareholder held below 20 percent of the share capital coupled with no-growth on average financed 47.985 percent of their assets with debt capital. Firms in which the largest shareholder held more than 51 percent (51 percent to 100 percent) of the share capital coupled with no-growth on average financed 42.03 percent of their assets with debt capital.

Firms in which the largest shareholder held 20 percent to 50 percent of the share capital coupled with negative growth on average financed 36.88 percent of their assets with debt capital, firms in which the largest shareholder held below 20 percent of the share capital coupled with negative growth appeared not to use debt to finance their assets. Firms in which the largest shareholder held more than 51 percent (51 percent to 100 percent) of the share capital coupled with negative growth on average financed 42 percent of their assets with debt capital.

5.3 Homogeneity of variance test – book value to market value on debt ratio

This test confirmed if the differences in capital structure (the total debt to the total asset ratio) by performance (book to market ratio), ownership structure (shareholdings) and interaction term (ownership structure*book to market ratio) are statistically significant. Table 3 depicts the results of the Levene's test of equality error variances.

Table 3. Levene's test of equality error variances: department ariable: Total Debt to Total Assets

F	df1	df2	Sig.
1.752	7	700	0.094

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + OwnStrCa + LeBtM + OwnStrCa * LeBtM

The significance result for homogeneity of variance is > 0.05; that is, 0.094, which indicates that the error variance of the dependent variable is equal across the groups.

5.4 Tests of between-subjects effects - dependent variable: total debt to total assets

The results of tests between subject variables with the total debt to the total asset ratio as dependent variable and book value to market value as predictor variable and ownership structure are presented in Table 4. The equation for the model is:

SS corrected model = SSOwnStrCa + SSLeBtM + SSOwnStrCa * LeBtM

1.008^{a} = 0.606 + 0.201 + 0.127

The significance value for ownership (OwnStrCa) is 0.012, is significant at <0.05; therefore, affect capital structure, but there is no effect of book value to market value (p = 0.230) on capital structure. The null hypothesis that "the mean total debt to a total asset ratio was not equal across all categories of the book value to market ratio" is rejected. There is also no discriminating effect of interaction term (OwnStrCa * LeBtM) on capital structure. The hypothesis that "the mean total debt to the total asset ratio was not equal across all categories of ownership structure (OwnStrCa)" is not supported by data; and the overall corrected model, F value = 2.11 and p-value of 0.040 are significant. The partial eta squared presented in Table 4 confirmed that except for the intercept, all other partial eta squares are either trivial or small. Therefore, the statement that "membership in categories defined by book value to market value class identification accounts for a reasonable amount of the differences in the total debt to the total asset ratio" is not supported by the data.

Table 4. Tests of between-subjects effects - dependent variable: total debt to total assets

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1.008[a]	7	.144	2.111	0.040	0.021
Intercept	21.926	1	21.926	321.526	0.0001	0.315
OwnStrCa	0.606	2	0.303	4.444	0.012	0.013
LeBtM	0.201	2	0.100	1.472	0.230	0.004
OwnStrCa * LeBtM	0.127	3	0.042	0.620	0.602	0.003
Error	47.735	700	0.068			
Total	165.245	708				
Corrected Total	48.743	707				

a. R Squared = .021 (Adjusted R Squared = 0.011)

5.5 Post Hoc Analysis- book value to market value on total debt to total assets

Post hoc multiple comparison tests help determine which means differ. This is critical for the study because the objective during this stage is to establish the impact of performance (book to market ratio) on capital structure (total debt to total assets) taking into account the different performance levels (positive growth, no growth and negative growth). The result of post-hoc analysis is in Table 5.

The next three statements are possible interpretation of the post-hoc effects. Each one should be verified independently for significance in terms of pair-wise comparisons, and the results are presented in Table 5. The first statement was that a group within the book value to the market value ratio categorised as "positive growth used more debt than the other group within the book value to the market value ratio categorised as no growth (=1). However, the difference of -0.041 between the two groups has a p-value of 0.21. Therefore, is not significant.

The second statement was that a group within the book value to the market value ratio classified as "no growth (=1) used more debt than the other group within the book value to the market value ratio classified as negative growth (>1). However, the difference of 0.004 between the two groups is associated with a p-value of 0.19, which is greater than the critical value of 0.05; the difference is not significant.

The third statement was that a group within the book value to the market value ratio classified as "positive growth (<1) used more debt than the other group within the book value to the market value ratio classified as negative growth (>1. However, the difference of -0.04 between the two groups is associated with a p-value of 0.985, which is greater than the critical value of 0.05; therefore, the difference is not significant.

Table 5. Multiple comparisons - total debt to total assets ratio by level of book to market ratio Tukey HSD

(I) Level of Book to Market Ratio	(J) Level of Book to Market Ratio	Mean Difference (I-J)	Std. Error	Sig.	95 percent Confidence Interval	
					Lower Bound	Upper Bound
Positive Growth <1	No Growth =1	-0.04054	0.024108	0.213	-0.01608	0.09717
	Negative Growth > 1	0.04444	0.025526	0.191	-0.01551	0.10440
No Growth =1	Positive Growth <1	-0.04054	0.024108	0.213	-0.09717	0.01608
	Negative Growth > 1	0.00390	0.023323	0.985	-0.05088	0.05868
Negative Growth > 1	Positive Growth <1	-0.04444	0.025526	0.191	-0.10440	0.01551
	No Growth =1	-0.00390	0.023323	0.985	-0.05868	0.05088

Based on observed means. The error term is Mean Square (Error) = 0.068.

Tukey's HSD (honest significant difference test) test is appropriate because the interest to the researcher is to find means that are significantly different from each other (Kinnear and Gray, 1999). The homogeneous subsets' output is generated along with post hoc tests and show, which pair of groups has significantly distinct means on the dependent variable. Subset output would not be interpreted if the main effect was not significant. Table 6 depicts the Turkey's HSD test.

Table 6. Tukey HSD[a,,b,,c]Total debt to total assets ratio by level of book to market ratio

Level of Book to Market Ratio	N	Subset
		1
Negative Growth > 1	222	0.39163
No Growth =1	288	0.39553
Positive Growth <1	198	0.43608
Sig.		0.162

Means for groups in homogeneous subsets are displayed.
Based on observed means.
The error term is Mean Square (Error) =0.068.
a. Uses Harmonic Mean Sample Size = 230.287.
b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

For each grouping variable, there are variations in capital structure (debt ratio), and the result in Table 6, show that cases of negative growth > 1 has a debt ratio 0.392, case of no-growth = 1 have a debt ratio of 0.396 while cases of positive growth <1 has a debt ratio of 0.436. If we ignore the statistical test of significance, and from the ranking, it appears that performance has some influence on capital structure. This is because cases of improved book value to market value are associated with more use of debt. However, given that means are all listed under one subset, and with a p-value of 0.162, it follows that the set of means are not statistically significantly different from each other. Furthermore, because all scores for the amount of debt used (see subset 1 in Table 6 above) across different levels of growth can be rounded to 40 percent, confirm no difference in total debt to the total asset ratio (capital structure) if the book value to market value is used as a grouping variable.

5.6 Influence of asset turnover ratio (performance) on total debt to total assets ratio (capital structure)

The asset turnover ratio was the first ranked indicator of performance as per canonical correlation analysis. At this stage of analysis, the question then is, "Does the asset turnover ratio (as a performance indicator) have influence on the total debt to the total asset ratio (capital structure)?

The different classes of asset turnover ratio and the total debt to the total asset ratio are presented in Table 7. The dependent variable is the total debt to the total asset ratio, and the independent variables are asset turnover ratio and ownership structure. The result showed that firms with a low asset turnover, on average financed 28.15 percent of their assets with debt, while firms with a medium asset turnover ratio financed 39.66 percent of their assets with debt; and firms with a high asset turnover ratio financed 54.68 percent of their assets with debt. The data confirmed that, in this market, on the average firm financed 40.79 percent of their assets using debt capital.

On examination of the asset turnover ratio (performance) there appears to be a performance effect (asset turnover effect) on capital structure. The variation in the total debt to the total asset ratio (capital structure) is easily visible across asset turnover ratio levels. Therefore, the NSE data confirms that low usage of debt is associated with low asset turnover ratio (performance) and that firms with a debt ratio above 54.68 percent outperform those with the medium and low debt ratio.

When the asset turnover ratio is used as an indicator of performance, the data on the NSE support the performance risk hypothesis, that is, more profitable, or that more efficient firms use more debt. The data fail to confirm the franchise value hypothesis that stipulates that firms might prefer to lower the total debt to the total asset ratio to reduce their exposure to financial risk. Therefore, the data support the hypothesis that the population means for low asset turnover ratio, medium asset turnover ratio and high asset turnover ratio with respect to total debt to total assets ratios (capital structure) are not equal taking into account ownership structure.

Levene's (1960) test for equality of variance is a criterion for satisfying this assumption, and the result presented in Table 8. The significance level for homogeneity of variance of 0.0001 confirmed that the error variance in the dependent (the total debt to the total asset ratio- capital structure) variable is not equal across the groups (asset turnover ratio); therefore, the assumption to the ANOVA test has not been met. The data reject the hypothesis that the population variances for low asset turnover ratio, medium asset turnover ratio and medium asset turnover ratio with respect to the total debt to the total dependent variable are equal.

Table 7. Performance (Lev Asset Turnover Ratio) on capital structure - dependent variable: total debt to total assets

Categorised Ownership Structure	Lev Asset Turnover Ratio	Mean	Std. Deviation	N
Shareholdings 20percent to 50percent	Low 0.073 - 0.6882	0.21975	0.171092	116
	Medium 0.6926 - 1.1073	0.39050	0.168437	83
	High 1.114 - 10.1856	0.57820	0.334240	74
	Total	0.36883	0.269185	273
Shareholdings 51percent to 100percent	Low 0.073 - 0.6882	0.34727	0.255778	116
	Medium 0.6926 - 1.1073	0.39237	0.183122	142
	High 1.114 - 10.1856	0.53606	0.280333	154
	Total	0.43338	0.256300	412
Shareholdings Below 20percent	Low 0.073 - 0.6882	0.05043	0.034182	2
	Medium 0.6926 - 1.1073	0.51884	0.235918	9
	High 1.114 - 10.1856	0.37930	0.270803	4
	Total	0.41918	0.271785	15
Total	Low 0.073 - 0.6882	0.28151	0.226391	234
	Medium 0.6926 - 1.1073	0.39657	0.181080	234
	High 1.114 - 10.1856	0.54680	0.298641	232
	Total	0.40790	0.263214	700

Table 8. Levene's Test of Equality of Error Variances[a] - Dependent Variable: Total Debt to Total Assets

F	df1	df2	Sig.
5.888	8	691	0.0001

Levene's Test of Equality of Error Variances tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + OwnStrCa + Lev Asset Turnover Ratio + OwnStrCa * Lev Asset Turnover Ratio

The results of "Tests of Between-Subjects Effects" presented in Table 9 is to confirm if the relationship between the asset turnover ratio, and the total debt to the total asset ratio is statistically significant. In the model in Table 9, the values of intercept, asset turnover ratio (LeAssTurn) and interaction term (OwnStrCa * LeAssTurn) are statistically significant because their significance level is greater than the cut off level of < 0.05; therefore, these variables have effect on capital structure. Ownership structure (OwnStrCa) (p = 0.126) has no effect on capital structure. The overall corrected model, F value = 21.46 and p-value of 0.0001 are statistically significant. The null hypothesis that "the mean total debt to the total asset ratio (capital structure) was not equal across all categories of the asset turnover ratio" is supported by data. The statistical test confirmed a relationship between the predicted variable (capital structure) and predictor variable (performance); and that the different categories of the independent variable performance (asset turnover ratio levels - low, medium, and high) are linked to the different average scores on the dependent variable (capital structure). However, this does not tell us which component of the asset turnover ratio, whether low, medium and high, behaves differently.

Effect size measures the strength of a phenomenon. The partial eta squared measure of effect size of the relationship between asset turnover ratio and total debt to the total asset ratio is presented in Table 9. Based on Cohen's criteria for effect size, except for the intercept, all other partial eta squares are small, but much higher than in the case of the book value to the market value ratio. The statement that "membership in categories defined by asset turnover ratio categories accounts for a reasonable amount of the differences in average total debt to the total asset ratio" is therefore, marginally supported.

Table 9. Tests of between-subjects effects - dependent variable: total debt to total assets

rce	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	9.638[a]	8	1.205	21.461	0.0001	0.199
Intercept	12.695	1	12.695	226.141	0.0001	0.247
OwnStrCa	.233	2	0.117	2.076	0.126	0.006
LeAssTurn	1.013	2	0.507	9.026	0.0001	0.025
OwnStrCa * LeAssTurn	1.215	4	0.304	5.411	0.0001	0.030
Error	38.790	691	0.056			
Total	164.896	700				
Corrected Total	48.428	699				

a. R Squared = 0.199 (Adjusted R Squared = 0.190)

5.7 Interpretation of the post-hoc effects – asset turnover ratio with total debt to total asset ratio

The next three statements are possible interpretation of the post-hoc effects. Each one is verified independently for significance in terms of pair-wise comparisons, and the results presented in Table 10. The first statement was a group within asset turnover ratio categorised as a low asset turnover ratio used more debt than the other group within the asset turnover ratio categorised as a medium asset turnover ratio. The difference between the means of -0.112 between the groups has a p-value of 0.0001, is therefore, significant.

The second statement was that a group within asset turnover ratio, categorised as the medium asset turnover ratio, used more debt than the other group within the asset turnover ratio categorised as the high asset turnover ratio. The difference between the group means of - 0.150, has a p-value of 0.0001, and is statistically significant.

The third statement was that a group within asset turnover ratio, categorised as a low asset turnover ratio, used more debt than the other group within the asset turnover ratio categorised as a high asset turnover ratio. However, the difference of 0.265 between the groups with a p-value of 0.0001, which is less than the critical value of 0.05 is statistically significant. Therefore, the null hypothesis that the population means for low asset turnover ratio (performance), medium asset turnover ratio and medium asset turnover ratio with respect to the total debt to total assets ratios as dependent variable (capital structure) are not equal taking into account ownership structure is supported by the data. Therefore, performance, when the asset turnover ratio is used as an indicator of performance has an effect on debt usage.

Table 10. Multiple comparisons - total debt to total assets ratio by Lev asset turnover ratio Tukey HSD

(I) Lev Asset Turnover Ratio	(J) Lev Asset Turnover Ratio	Mean Difference (I-J	Std. Error	Sig.	95 percent Confidence Interval	
					Lower Bound	Upper Bound
Low 0.073 - 0.6882	Medium 0.6926 - 1.1073	-.11506*	0.021904	0.0001	-0.16650	-0.06361
	High 1.114 - 10.1856	-.26529*	0.021951	0.0001	-0.31685	-0.21373
Medium 0.6926 - 1.1073	Low 0.073 - 0.6882	.11506*	0.021904	0.0001	0.06361	0.16650
	High 1.114 - 10.1856	-.15023*	0.021951	0.0001	-0.20179	-0.09867
High 1.114 - 10.1856	Low 0.073 - 0.6882	.26529*	0.021951	0.0001	0.21373	0.31685
	Medium 0.6926 - 1.1073	.15023*	0.021951	0.0001	0.09867	0.20179

Based on observed means, the error term is Mean Square (Error) = 0.056. *.

The homogenous subsets test from total debt to total assets ratio with the asset turnover ratio. The derived groups are used to predict total debt to the total asset ratio (capital structure) and to establish if there are significant capital structure variations between the groups. The means that are listed under each subset comprise a set of means that are not significantly different from each other, but in this case, as shown in Table 11, are under different subsets; because each group is under a different subset. We conclude that the total debt to the total asset ratio for groups within the asset turnover ratio is significantly distinct.

Table 11. Homogenous subset total debt to total assets ratioTukey HSD[a,,b,,c]

Lev Asset Turnover Ratio	N	Subset		
		1	2	3
Low 0.073 - 0.6882	234	0.28151		
Medium 0.6926 - 1.1073	234		0.39657	
High 1.114 - 10.1856	232			0.54680
Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed. Based on observed means, the error term is Mean Square (Error) = 0.056.
a. Uses Harmonic Mean Sample Size = 233.330.
b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.
c. Alpha = 0.05.

Poor asset turnover ratios are associated with low usage of debt. That group financed only 28.15 percent of the assets with debt capital; whereas cases of a high asset turnover ratio are associated with more usage of debt, as that group financed 54.68 percent of the assets with debt capital. The null hypothesis that the population means and variance for low asset turnover ratio (performance), medium asset turnover ratio and medium asset turnover ratio with respect to the total debt to the total asset ratio (capital structure) are not equal taking into account ownership structure is supported by the data.

5.8 Influence of total debt to total asset ratio (capital structure) on book value to market value performance

The basic statistics for each combination of factor and covariate in the model, capital structure (debt ratio levels) and ownership structure (shareholdings) as the predictor variable with the book to market value as the independent variable are in Table 12. The result showed that firms with a high debt ratio have on average the highest book value to the market value ratio (growth) of 1.486, and that not much difference in the book value to the market value ratio between the medium debt ratio (with the book value to the market value ratio of 2.11) and a low debt ratio (with the book value to the market value ratio of 1.71), that is, if rounded to one decimal point, (see total section in Table 12). The best performance is associated with a high debt ratio.

It appears that ownership structure has influence on performance. Firms in which the largest shareholder held 20 percent to 50 percent of the share capital on average had a book value to the market value ratio of 1.19; firms in which the largest shareholder held more than 51 percent (51 percent to 100 percent) of the share capital on average had the lowest book value to the market value ratio of 2.077, and firms in which the largest shareholder held below 20 percent of the share capital on average had the highest book value to market value of 0.45. The best performance is associated with dispersed shareholding; and it is possible that the shares of such trade frequently.

Firms in which the largest shareholder held 20 percent to 50 percent of the share capital coupled with a high debt ratio had an average book value to the market value ratio of 0.968; firms in which the largest shareholder held below 20 percent of the share capital coupled with a high debt ratio had an average book value to the market value ratio of 0.432; and firms in which the largest shareholder held more than 51 percent (51 percent to 100 percent) of the share capital coupled with a high debt ratio had an average book value to the market value ratio of 1.816. The best bet then would be a firm where shareholding is dispersed (shareholdings below 20 percent) with a substantial amount of debt in capital structure.

Firms in which the largest shareholder held 20 percent to 50 percent of the share capital coupled medium debt ratio had an average book value to market value of 1.194; firms in which the largest shareholder held below 20 percent of the share capital coupled medium debt ratio had an average book value to the market value ratio of 1.025; and firms in which the largest shareholder held more than 51 percent (51 percent to 100 percent) of the share capital coupled with a medium debt ratio had an average book value to the market value ratio of 2.601. The best bet then would be a firm where shareholding is dispersed (shareholdings

below 20 percent) with the medium amount of debt in capital structure.

Table 12. Descriptive statistics capital structure (debt ratio) on performance - dependent variable: book value to market value ratio

Categorised Ownership Structure	Categorised Total Debt to Total Assets	Mean	Std. Deviation	N
Shareholdings 20 percent to 50 percent	High Debt ratio 0.45 to 2.03956	0.9682	0.8330	87
	Medium Debt ratio 0.3515 to 0.44781	1.1944	1.0135	41
	Low Debt ratio 0 to 0.34278	1.3274	1.1492	145
	Total	1.1929	1.0466	273
Shareholdings 51percent to 100 percent	High Debt ratio 0.45 to 2.03956	1.8161	2.2310	162
	Medium Debt ratio 0.3515 to 0.44781	2.6017	6.2202	82
	Low Debt ratio 0 to 0.34278	2.0722	3.9269	176
	Total	2.0768	3.9891	420
Shareholdings Below 20 percent	High Debt ratio 0.45 to 2.03956	0.4325	0.3062	8
	Medium Debt ratio 0.3515 to 0.44781	1.0250	0.3889	2
	Low Debt ratio 0 to 0.34278	0.2600	0.1720	5
	Total	0.4540	0.3556	15
Total	High Debt ratio 0.45 to 2.03956	1.4860	1.8870	257
	Medium Debt ratio 0.3515 to 0.44781	2.1149	5.1052	125
	Low Debt ratio 0 to 0.34278	1.7131	3.0096	326
	Total	1.7016	3.1735	708

Firms in which the largest shareholder held 20 percent to 50 percent of the share capital coupled with a low debt ratio had an average book value to the market value ratio of 1.327; firms in which the largest shareholder held below 20 percent of the share capital coupled with a low debt ratio had an average book value to the market value ratio of 0.260; and firms in which the largest shareholder held more than 51 percent of the share capital coupled with a low debt ratio had an average book value to the market value ratio of 2.072. The best bet then would be a firm where shareholding is dispersed (shareholdings below 20 percent) with a low amount of debt in capital structure.

The homogeneity of variance test confirms the differences in variances in performance (book value ratio to the market value ratio) predicted by capital structure (across categories of the total debt to the total asset ratio), ownership structure (shareholdings) and interaction term (ownership structure* total debt to the total asset ratio). Levene's (1960) test for equality of variance is a criterion for satisfying this assumption, and the result presented in Table 13.

Table 13. Levene's test of equality of error variances a dependent variable: book to market ratio

F	df1	df2	Sig.
6.042	8	699	0.0001

The significance result for homogeneity of variance is <.05, which shows that the error variance of the dependent variable is not equal across the groups, that is, the assumption of the ANOVA test has not been met.

The results of tests between subject variables with the book value to the market value ratio as dependent variable and total debt to the total asset ratio as predictor variable and ownership structure as a control variable are presented in Table 14. Since there is more than one independent variable for this analysis, the entries for the "Corrected Model" and the variable will not be identical.

Table 14. Tests of between-subjects effects - dependent variable: book value to market value ratio

Source	*Type III Sum of Squares*	*Df*	*Mean Square*	*F*	*Sig.*	*Partial Eta Squared*
Corrected Model	194.580[a]	8	24.323	2.455	0.013	0.027
Intercept	153.427	1	153.427	15.485	0.0001	0.022
OwnStrCa	150.905	2	75.453	7.615	0.001	0.021
TDtTAca	3.824	2	1.912	0.193	0.825	0.001
OwnStrCa * TDtTAca	9.838	4	2.459	0.248	0.911	0.001
Error	6925.827	699	9.908			
Total	9170.405	708				
Corrected Total	7120.407	707				

The significance value of intercept, ownership structure (OwnStrCa) values (ownership) are significant (<0.05), therefore, these variables have effect on the book value to the market value ratio (performance). However, there is no effect of the total debt to the total asset ratio (TDtTAca) (p = 0.825) on the book value to the market value ratio (performance). The null hypothesis that "the mean book value to the market value ratio was not equal across all categories of the total debt to the total asset ratio" is not supported by the data. The result showed that there is no effect of interaction term (OwnStrCa * TDtTAca), (p = 0.911) on the book value to the market value ratio (performance). However, ownership structure (OwnStrCa) has effect (p = 0.001) on book value to the market value ratio (performance); therefore, the hypothesis that "the mean book value to market value was equal across all categories of ownership structure (OwnStrCa)" is not supported by the data. The overall corrected model, F value = 2.455 and p-value of 0.013 are statistically significant. On the basis of Cohen's criteria, all partial eta squares are trivial. The statement that membership in categories defined by total debt to total asset ratio class identification accounts for the differences in the average book value to the market value ratio is not supported by the data.

The next three statements are possible interpretation of the post-hoc effects. Each statement is verified independently for significance in pair-wise comparisons, and the results are presented in Table 15. The first statement was, a group within the total debt to the total asset ratio categorised as "high debt ratio" outperformed (showed a better book value to market ratio) the other group categorised as "medium debt ratio." However, the difference between the two groups' means of -0.629 showed a significance p-value of 0.160, is greater than the critical value of 0.05; therefore, the difference between the means is not statistically significant.

The second statement was, a group within the total debt to the total asset ratio categorised as "medium debt ratio" post a better performance (showed a better book value to market ratio) those classified as "low debt ratio." The groups' mean difference of 0.402 has a p-value of 0.446, which is greater than the critical value of 0.05. The difference is not statistically significant.

The third statement was, a group within the total debt to the total asset ratio categorised as "low debt ratio" post a better performance (book value to market ratio) than those classified as "high debt ratio" . The groups' mean difference of 0.227 has a p-value of 0.663, which is greater than the critical value of 0.05. The difference is not statistically significant. The 95 percent confidence intervals reported to confirm that the differences among the means are by chance. Therefore, as far as the data for this study, there are no visible differences in performance across different categories of debt levels. If we stop the study at this point, then the conclusion is that debt capital has no influence on performance; therefore, debt capital fails to reinforce corporate governance. Table 15 depicts the multiple comparisons book to market ratio Turkey HSD.

The final test is the homogenous subsets' test, and the results are presented in Table 16. However, given that means are all listed under one subset, it follows that the means are not significantly different from each other, and the p-value of 0.113, is greater than 0.05, confirmed no difference in book value to market value (performance) if the total debt to the total asset ratio (capital structure) is used as a discriminating variable.

Table 15. Multiple comparisons book to market ratio Tukey HSD

(I) Categorised Total Debt to Total Assets	(J) Categorised Total Debt to Total Assets	Mean Difference (I-J)	Std. Error	Sig.	95percent Confidence Interval	
					Lower Bound	Upper Bound
High Debt ratio 0.45 to 2.03956	Medium Debt ratio 0.3515 to 0.44781	-0.629	0.343	0.160	-1.435	0.177
	Low Debt ratio 0 to 0.34278	-0.227	0.263	0.663	-0.844	0.390
Medium Debt ratio 0.3515 to 0.44781	High Debt ratio 0.45 to 2.03956	0.629	0.343	0.160	-0.177	1.435
	Low Debt ratio 0 to 0.34278	0.402	0.331	0.446	-0.376	1.180
Low Debt ratio 0 to 0.34278	High Debt ratio 0.45 to 2.03956	0.227	0.263	0.663	-0.390	0.844
	Medium Debt ratio 0.3515 to 0.44781	-0.402	0.331	0.446	-1.180	0.376

Table 16. Book value to market value Tukey HSDa,,b,,c

Categorised Total Debt to Total Assets	N	Subset
		1
High Debt ratio 0.45 to 2.03956	257	1.48599
Low Debt ratio 0 to 0.34278	326	1.71313
Medium Debt ratio 0.3515 to 0.44781	125	2.11488
Sig.		0.113

5.9 Influence of total debt to total assets ratio on asset turnover ratio

The statistics presented in table 17 capital structure (total debt ratio) has a discriminating effect on performance (assets turnover ratio). Firms with a high debt ratio have on average an asset turnover ratio of 2.32, and there is sizable difference in the average asset turnover ratio between firms with medium debt ratio (2.21) and firms with a low debt ratio (1.66). The average ratio in all cases is two (2).

Ownership structure marginally influenced the asset turnover ratio. Firms in which the largest shareholder held between 20 percent to 50 percent of the share capital on average had an asset turnover ratio of 1.85, firms in which the largest shareholder held more than 51 percent (51 percent to 100 percent) of the share capital on average had an asset turnover ratio of 2.09; and firms in which the largest shareholder held below 20 percent of the share capital on average had an asset turnover ratio of 2.13. There may be an interaction effect between capital structure and ownership structure, because the mean differences in the asset turnover ratio by the debt ratio vary between ownership structures.

Firms in which the largest shareholder held 20 percent to 50 percent of the share capital coupled with a high debt ratio (the total debt to the total asset) had an average asset turnover ratio of 2.32; firms in which the largest shareholder held below 20 percent of the share capital coupled with a high debt ratio had an average asset turnover ratio of 2.25, and firms in which the largest shareholder held more than 51 percent of the share capital coupled with a high debt ratio exhibit an average asset turnover ratio of 2.31. These averages appear not to be significantly different.

Firms in which the largest shareholder held 20 percent to 50 percent of the share capital coupled with a medium debt ratio had an average asset turnover ratio of 2.05. Firms in which the largest shareholder held below 20 percent of the share capital coupled with a medium debt ratio had an average asset turnover ratio of 2.50 and firms in which the largest shareholder held more than 51 percent of the share capital coupled with a medium debt ratio had an average asset turnover ratio of 2.28.

Firms in which the largest shareholder held 20 percent to 50 percent of the share capital coupled with a low debt ratio had an average asset turnover ratio of 1.50. Firms in which the largest shareholder held below

20 percent of the share capital coupled with a low debt ratio had an average asset turnover ratio of 1.80; and firms in which the largest shareholder held more than 51 percent of the share capital coupled with a low debt ratio had an average asset turnover ratio of 1.79. The best bet then would be a firm where shareholding is dispersed (shareholdings below 20 percent) with a low amount of debt in capital structure.

Table 17. Capital structure (debt ratio) on performance dependent variable: asset turnover ratio

Categorised Ownership Structure	Categorised Total Debt to Total Assets	Mean	Std. Deviation	N
Shareholdings 20percent to 50percent	High Debt Ratio 0.45 to 2.03956	2.32	0.755	87
	Medium Debt Ratio 0.3515 to 0.44781	2.05	0.773	41
	Low Debt Ratio 0 to 0.34278	1.50	0.708	145
	Total	1.85	0.821	273
Shareholdings 51percent to 100percent	High Debt Ratio 0.45 to 2.03956	2.31	0.784	162
	Medium Debt Ratio 0.3515 to 0.44781	2.28	0.690	82
	Low Debt Ratio 0 to 0.34278	1.79	0.783	168
	Total	2.09	0.805	412
Shareholdings Below 20percent	High Debt Ratio 0.45 to 2.03956	2.25	0.463	8
	Medium Debt Ratio 0.3515 to 0.44781	2.50	0.707	2
	Low Debt Ratio 0 to 0.34278	1.80	0.837	5
	Total	2.13	0.640	15
Total	High Debt Ratio 0.45 to 2.03956	2.32	0.764	257
	Medium Debt Ratio 0.3515 to 0.44781	2.21	0.722	125
	Low Debt Ratio 0 to 0.34278	1.66	0.761	318
	Total	2.00	0.816	700

The best bet for performance sensitive investors would be a firm where shareholding is dispersed (shareholdings by the top investors is below 20 percent) and with a medium amount of debt in capital structure because at that level, the highest asset turnover ratio of 2.50 is posted. This suggests existence of an optimal capital structure.

The homogeneity of variance test confirms the differences in variances in performance (the asset turnover ratio) predicted by capital structure (across categories of the total debt to the total asset ratio), ownership structure (shareholdings) and interaction term (ownership structure* total debt to the total asset ratio). Levene's test for equality of variance is a criterion for satisfying this assumption, and the result presented in Table 18.

Table 18. Levene's test of equality of error variancesa - dependent variable: Lev asset turnover ratio

F	df1	df2	Sig.
1.674	8	691	0.101

Levene's Test of Equality of Error Variances, tests the null hypothesis that the error variance of the dependent variable is equal across groups. a. Design: Intercept + OwnStrCa + TDtTAca + OwnStrCa * TDtTAca.

The significance result for homogeneity of variance is >0.05, which shows that the error variance of the dependent variable is equal across the groups, that is, the assumption of the ANOVA test has been met.

The relationship between the predicted variable (the asset turnover ratio as a performance indicator) and predictor variable (grouping variable - total debt to the total asset ratio as a capital structure indicator) if confirmed, is evidence that distinct categories of the independent variable. The statement is correct if the relationship is statistically significant in the "Tests of Between-Subjects Effects." The results of tests of between-subjects effects in Table 19. The tests confirm there is an effect of total debt to total assets ratio

(capital structure) (TDtTAca) (p = 0.0001) on the asset turnover ratio (performance). The null hypothesis that "the mean asset turnover ratio was not equal across all categories of total debt to total assets" is supported by data." There is no effect of interaction term (OwnStrCa * TDtTAca), (p-value = 0.239). Ownership structure (OwnStrCa) has the effect on the asset turnover ratio, p = 0.030; therefore, the null hypothesis that "the mean asset turnover ratio value is equal across all categories of ownership structure (OwnStrCa)" is not supported by data. The overall corrected model, F value = 16.905 and p-value of 0.0001 are statistically significant. On the basis of Cohen's criteria, all partial eta squares are small. The statement that "membership in categories defined by the total debt to the total asset ratio as class identification accounts for the differences in the average asset turnover ratio" is marginally correct.

Table 19. Tests of between-subjects effects - dependent variable : asset turnover ratio

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	76.276[a]	8	9.535	16.905	0.0001	0.164
Intercept	396.402	1	396.402	702.852	0.0001	0.504
OwnStrCa	3.978	2	1.989	3.527	0.030	0.010
TDtTAca	9.797	2	4.898	8.685	0.0001	0.025
OwnStrCa * TDtTAca	3.115	4	.779	1.381	0.239	0.008
Error	389.718	691	.564			
Total	3258.000	700				
Corrected Total	465.994	699				

The next three statements are possible interpretation of the post-hoc effects. Each one is verified independently for significance in the table of pair-wise comparisons in Table 20. The first statement was that a group within the total debt to the total asset ratio that was categorised as a "high debt ratio" outperformed (showed a better asset turnover ratio) the other group categorised as a "medium debt ratio". The mean difference between the groups of 0.11, has a p-value of 0.391 is therefore, not statistically significant.

Table 20. Multiple comparisons asset turnover ratio - Tukey HSD

(I) Categorised Total Debt to Total Assets	(J) Categorised Total Debt to Total Assets	Mean Difference (I-J)	Std. Error	Sig.	95percent Confidence Interval	
					Lower Bound	Upper Bound
High Debt Ratio 0.45 to 2.03956	Medium Debt Ratio 0.3515 to 0.44781	0.11	0.082	0.391	-0.09	0.30
	Low Debt Ratio 0 to 0.34278	0.66*	0.063	0.0001	0.51	0.81
Medium Debt Ratio 0.3515 to 0.44781	High Debt Ratio 0.45 to 2.03956	-0.11	0.082	0.391	-0.30	0.09
	Low Debt Ratio 0 to 0.34278	0.55*	0.079	0.0001	0.36	0.74
Low Debt Ratio 0 to 0.34278	High Debt Ratio 0.45 to 2.03956	-0.66*	0.063	0.0001	-0.81	-0.51
	Medium Debt Ratio 0.3515 to 0.44781	-0.55*	0.079	0.0001	-0.74	-0.36

The second statement was that a group within the total debt to the total asset ratio categorised as "medium debt ratio" outperformed (showed a better asset turnover ratio) the other group categorised as "low debt ratio." The mean difference between the two groups of 0.55, showed a p-value of 0.0001 is therefore, statistically significant.

The third statement was, a group within the total debt to the total asset ratio that categorised as "low debt ratio" outperformed (showed a better asset turnover ratio) the other group categorised as "high debt ratio". However, the mean difference of -0.66, between the two groups' showed a p-value of 0.0001, and is statistically significant. Based on preceding findings, capital structure (the total debt to the total asset ratio) has a discriminating effect on performance (asset turnover ratio). This is unlike the case when the book value to market value is a performance indicator.

The homogenous subsets' tests of the asset turnover ratio by total debt to total assets ratio result are presented in Table 21. From the results, there is evidence that debt ratios have a discriminating effect, that is, different debt levels are associated with different levels of performance. Firm or cases with a low debt ratio are associated with the lowest asset turnover ratio.

Table 21. Tukey HSDa,,b,,c - asset turnover ratio

Categorised Total Debt to Total Assets	N	Subset	
		1	2
Low Debt ratio 0 to 0.34278	318	1.66	
Medium Debt ratio 0.3515 to 0.44781	125		2.21
High Debt ratio 0.45 to 2.03956	257		2.32
Sig.		1.000	0.328

Means for groups in homogeneous subsets are displayed.

Based on observed means, the error term is Mean Square (Error) = 0.564.

6 Summary and conclusion

Until now, researchers are not in consensus, whether it is the capital structure that influences performance or performance that influences capital structure or both (***Margaritis and Psillaki,*** 2010; ***Margaritis and Psillaki, 2007***). One may argue that debt capital would reduce agency costs, however, it can also induce agency benefits if there are visible differences in performance across different levels of capital structure and visible differences in capital structure across different levels of performance. Thus managers would look at performance in managing debt levels and vice versa. The resulting proposition is that capital structure decisions are relevant and not irrelevant as stated in Modigliani and Miller (1958). On the Nairobi Securities Exchange, there are large differences in leverage ratios and the question then is, if the capital structure decision is not important, how does one explain variations in leverage ratios? The main objective of this study was to establish the relationship between capital structure and financial performance of firms listed on the NSE by employing a generalised linear model (GLM) as an improvement on ordinary least regression (OLS).

Two hypotheses were tested during the study. The first hypothesis (effect of performance on leverage) is based on two theories, namely: return - risk hypothesis and franchise value hypothesis (Margaritis and Psilaki 2010; Berger and Bonaccorsi di Patti, 2006). The second hypothesis was the influence of debt on performance (effect of leverage on performance), this hypothesis stipulates that debt capital can have a positive or negative influence on performance (Cheng and Tzeng, 2011; Margaritis and Psillak, 2008).

The results of the analysis on the first hypothesis confirms that efficient and profitable firms employ more debt than comparable firms that are less profitable possibly because profitable firms' exposure to financial risk is low (propensity to be bankrupt is low). There is no evidence to support the franchise hypothesis that more efficient firms use less debt as

suggested in Margaritis and Psillak, (2008), and Lai, Lin and Wen, (2005). However, the data only show statistically significant relationship if asset turnover ratio and not the book value to the market value ratio is used as a performance indicator to predict usage of debt capital. The results confirm the existence of concentrated equity ownership on firms listed on the NSE as pointed out by He and Matvos (2012).

With regard to the second hypothesis, the results, after controlling for ownership structure, indicate that firms that use more debt outperformed those that use less debt. Therefore, the data on the NSE support the efficiency hypothesis that the use of debt capital alleviates agency costs so as to improve firm performance (Mishkin 2010; Margaritis and Psillak, 2007; Tirole, 2006; Jensen, 1986; Jensen and Meckling, 1976). Such a finding negated the original hypothesis in Modigliani and Miller (1958) that capital structure decision is irrelevant and would imply the existence of an optimum capital structure on the NSE.

7 Managerial implication and recommendations

In a number of studies, ROA and ROE are used as measures of performance to assess the relationship between performance and capital structure. In this study, asset turnover ratio and book value to market values as measures of performance was employed to investigate the relationship between capital structure and performance and that the appropriate measure of usage of debt is the total debt to the total asset. The study adds to the theory of choice of variables to employ in studies of capital structure. The theory is that the choice of indicators of both capital structure and performance is contingent on the data employed and could vary from country to country.

It is therefore recommended that managers should be aware that asset turnover ratio could best relate positively to borrowing levels, and that performance and capital structure are important concepts in managing firms. In addition, book value to market value has a suppressing effect on the level of borrowing. It further recommended that researchers conducting studies on the relationship between capital structure and performance should not only depend on ROE and ROA as measures of performance, but should explore other performance indicators by applying canonical correlation. This is because the choice of variables is contingent on the data set employed.

8 Limitations of the study

The limitation of this study is that data was limited to non-financial firms listed on the NSE for the period 1990 to 2012, inclusion of financial firms would allow for generalisation of the findings.

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