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Capital Structure, Firm Efficiency and Firm Value: The Case of Listed Non-Financial Firms in Kenya

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Abstract
This study examined the influence of a firm's efficiency on the relationship between capital structure and firm value. The study analyzed thirty non – financial firms listed at the Nairobi Securities Exchange for a period of six years from 2008 to 2013.Capital structure was parameterized as the ratio of retained earnings to total capital, ratio of debt to total capital and ratio of equity to total capital of the firm. Efficiency is measured as the distance from the best practice frontier in the industry. The firm's efficiency is measured by operational efficiency, cost efficiency and profit efficiency. Firm value is measured by its inputs and outputs. The inputs to the firms production are financing costs (FINC), distribution costs (DISTC), tax liability (TAX), and administrative expenses (ADEXP). The outputs are earnings per share(EPS)and the share price (SP).This study applied panel data analysis using fixed effects model. The results showed that cost efficiency negatively influences the relationship between capital structure and firm value as measured by the SP through increase in distribution costs, administrative costs in financing efficiency improvements in the firm's core processes. Further Operating efficiency negatively and statistically significantly affects the relationship between firm value and capital structure through the increase in financing costs, distribution costs, administration costs and taxation costs. The results showed that profit efficiency negatively and insignificantly influences the relationship between capital structure and firm value as measured by the SP. Consequently it has a positive but statistically insignificant effect on financing costs, distribution costs, administrative costs and taxation costs. Moreover, capital structure has a positive and statistically significant effect on firm value but firm efficiency insignificantly influences the relationship between capital structure and firm value. This study does not investigate the reverse relationship like Margaritis and Psillaki (2007).
Keywords: Capital Structure, Firm Efficiency, Firm Value, Listed Non-Financial Firms, Nairobi Securities Exchange

1. Introduction

There is plenty of theoretical literature that examines the relationship between capital structure and firm value (Harris and Raviv, 1991; Shleifer and Vishny, 1997). However, there are far much fewer empirical studies that demonstrate the application of these theories to real life situations within corporations (Rajan and Zingales, 1995; Beattie, et al., 2006). As correctly noted by Margaritis and Psillaki (2007) the main problem is the measurement of the relevant variables that are known to affect capital structure and firm value that are closely related to the definition of agency costs. Consequently, there is no conclusive evidence in support of the agency cost hypothesis. Like Margaritis and Psillaki (2007) this study employs the X-efficiency measures of firm efficiency to illuminate the capital structure firm values nexus. However, it disaggregates the firm efficiency measure variable into cost efficiency, operational efficiency and profit efficiency. Furthermore, it extents Margaritis and Psillaki (2007) study by examining how capital structure and firm efficiency influence firm value. It also decomposes firm value into its inputs and outputs.

For the last two decades there have been numerous reports on mismanagement, maladministration and financial irregularities among firms listed at the Nairobi Securities Exchange (NSE)in Kenya (NSE Handbook, 2014).Performance of firms listed at the NSE has been dismal to the extent that some have lately called for financial bailout(NSE Handbook, 2014). This has been attributed to capital structure decisions as well as other factors within and outside the firm. Some firms at the NSE have faced distressing situations following their dismal performance and have been under constant pressure to improve their market value or be delisted. Other firms have performed exceedingly well despite financing their investments using risky short term debt. This means that apart from capital structure there are other factors that influence the market value of the firm. These factors are suggested in the literature: firm size, age, product market, ownership, firm productivity and efficiency, institutional factors, industry type and corporate governance (Harris and Raviv, 1991; Shleifer and Vishny, 1997). There are equally very few studies that have analyzed the relationship between capital structure and firm value in Kenya. Akoten, et al. (2006) studied the impact of access to credit on the profitability and growth of Micro and Small Enterprises (MSEs) and reported a limited impact. Moyi (2013) examined the impact of access to credit on sales growth among Small Enterprises(SEs) and found a positive impact. Nkurunziza (2010) examined the effect of credit on growth and convergence of firm size in Kenyan manufacturing sector and reported a positive result. Thus, empirical evidence is mixed and scanty. Also, none of these studies examined the nexus between capital structure, firm efficiency and firm value. Therefore, this study contributes to the capital structure and firm value

debate by filling this gap. The study also unbundles firm efficiency into cost efficiency, operational efficiency and profit efficiency to illuminate the channels through which capital structure impacts on firm value. Firm value is also examined in a disaggregated form in terms of its inputs and outputs.

The influence of firm efficiency on the relationship between capital structure and firm value is underpinned by the Agency Theory (Jensen and Meckling, 1976; Myers, 1977; Myers and Majluf, 1984; Harris and Raviv, 1990; Walsh and Ryan, 1997). The Agency Theory shows that conflicts of interest between principals and agents impacts on the value of the firm.For instance, managers with free cash flows can reduce the value of the firm by investing them in unprofitable ventures (Jensen, 1986). The optimal decision in this case is to distribute the free cash flows as dividends to the shareholders or repurchasing shares (Barclay and Smith, 2001). This increases the operational efficiency of the firm (Chew, 2001). Conflict of interest also exists between debt and equity holders of growth firms that are facing financial constraints. When managers act in the best interest of the equity holders they might under invest because they realize that any additional capital investment financed by debt is more likely to benefit debt holders more than equity holders (Myers, 1977). The relationship between managers and employees is also a potential source of conflict. Employees might shirk responsibilities or demand higher salaries, wages and other perks. This increases production costs or reduces operational efficiency. Consequently, this reduces the profitability and the value of the firm.

There are two objectives in this study. The first objective is to examine explicitly the effect of production, cost and profitability decisions on the relationship between capital structure and firm value. The second objective is to analyse the disciplinary effect of leverage on firm efficiency and firm value. This study contributes to the existing literature in at least two ways. First, it disaggregates firm efficiency into cost efficiency, operational efficiency and profit efficiency. Second, this study extents the capital structure – firm efficiency literature by studying how the two variables affect firm value. This study answers the following questions. Does capital structure influence firm value? Through what channels does capital structure influence firm value? Does firm efficiency influence the relationship between capital structure and firm value?

The rest of the study is organized as follows. Section 2 presents the theoretical literature. Section 3 analyzes the empirical literature. Section 4 presents the research methodology. Section 5 discusses the results. Section 6 draws the conclusions while section 7 examines the policy implications of the results.

2. Agency Costs Theory

Theory based on agency costs illustrates that firm's capital structure is determined by agency costs, which includes the costs for both debt and equity issues. The costs related to equity issue may include, the monitoring expenses of the principal, the bonding expenses of the agent, reduced welfare for principal due to divergence of agent's decisions from those which maximizes the welfare of the principal .Besides, debt issues increases the owner-manager's incentive to invest in high-risk projects that yield high returns to the owner-manager but increase the likelihood of failure that the debts holders have to share if it is realised. If debt holders anticipate this a higher premium will be required, which in turns increases the cost of debt. Then, in the agency costs of debt include the opportunity costs caused by the impact of debt on the investment decisions of the firm, the monitoring and bonding expenditures by both the bondholders and the owner-manager and the costs associated with bankruptcy and reorganisation (Hansaker,1999). Since both equity and debt incur agency costs, the optimal debt-equity ratio involves a trade-off between the two types of costs. Agency costs arise due to the conflicts of interest between firm's owners and managers'. Jensen and Meckling (1976) introduce two types of conflicts between shareholders and managers and conflicts between shareholders and bondholders. In the agency models of Jensen and Meckling (1976), Easterbrook (1984) and Jensen (1986) the interests of managers are not aligned with those of security holders. Also managers tend to waste free cash flow (the excess of cash earnings over profitable investments) on perquisites and bad investments. Dividends and especially debt help control this agency problem by forcing managers to pay out the firms excess cash.

A firm's free cash flow is determined by the earnings from its assets in place and the size of its profitable investments. The model predicts that to control the agency costs created by free cash flow, firms with more profitable assets in place commit a larger fraction of their pre interests earnings to debt payments and dividends. Thus controlling for investment opportunities, the dividend pay-out and leverage are positively related to profitability, conversely, firms with more investments relative to earnings have less need for the discipline of dividends and debt. Thus controlling for profitability, firms with more investment have lower dividend pay-out and less leverage. Incentive to control the stockholders–bondholders agency problems that arises when debt is risky, the underinvestment and asset substitution conflicts discussed by Fama and Miller (1972), Jensen and Meckling (1976) and Myers (1977) also leads to predictions that firms with more investments have lower dividend pay-out and less leverage. Finally, in the agency story, dividends and debts are substitutes for controlling free cash flow problems, so the predicted relation between target leverage and the target pay-out ratio is negative. When wastages in free cash flow is controlled and the funds are directed profitable firm's investment the firm will be appealing to the investors to bid for the ownership of firm , this will create demand

for the firm shares improving the share price of the firm (Fama & Miller, 1972).

3. Empirical Literature Review

Theoretically, optimal capital structure coupled with efficient management of firm's operations, costs of inputs, driven by profit motive play a strategic role and contribute to enhancement of firm's value. Empirical studies on capital structure and firm's value have shown that there is a relationship between the two. However, the direction of the relationships depends on the variables used in the model. Studies on the relationship between capital structure and firm efficiency report mixed results.

3.1Capital Structure, Firm Efficiency and Firm Value

Theoretically, leverage can influence firm value through easing the cash flow constraints facing the firm. This increases the investments in fixed assets (Fazzari, et al., 1988) and human capital (Nickell and Daphne, 1999)that are key inputs in firm production. Therefore, the value of the firm depends upon leverage and the efficiency of the firm (Nickell et al., 1997; Nickell and Daphne, 1999). Many studies on macroeconomic growth have demonstrated that gross country differences in growth of GDP per capita are due to growth in total factor productivity (TFP) (Hall and Jones, 1999; Easterly and Levine, 2001). Therefore, it is interesting to inquire whether finance influences growth through its impact on the efficiency of the firm. This could be the case if the financial markets are able to supply capital to firms and monitor them to achieve efficiency. However, there is very scanty empirical evidence on the relationship between capital structure, firm efficiency and firm value (Nucci, et al., 2005; Gatti and Love, 2008; Burtler and Cornaggia, 2010; Chen and Guariglia, 2011). Existing empirical evidence is mixed. Most studies have found a positive relationship between capital structure and firm productivity (Nickell, et al., 1997; Nickell and Daphne, 1999;Fernandes, 2008; Ossei-Assibey, 2013).Nickell et al (1997) and Nickell and Daphne (1999) observed a positive relationship between indebtedness and TFPin the United Kingdom.

Other studies have reported a negative relationship between capital structure and firm productivity. Pushner (1995) found negative effect of leverage on firm performance measured as total factor productivity (TFP) in Japan. Booth et al (2001) in their study of 10 developing countries found a negative relation between leverage and firm performance and firm value. Onaolapo and Kajola (2010) found a significant negative impact of leverage on financial measures of firm performance in Nigeria. Several studies have examined the performance implications of firm efficiency measures and/ or efficiency changes using frontier analysis. Greene and Segal (2004) argue that "cost inefficiency affects profits and growth through the negative effect of wasted resources on earnings and cash flows." This implies that more operationally efficient firms should be more profitable. Greene and Segal, (2004) used SFA and documented a contemporary association between profitability (ROE and ROA) and efficiency in the US life insurance industry. Fenn, Drakos, Andrews and Knox (2008) conducted a more broad research on firm efficiency for a large sample of European manufacturing companies including food and chemicals manufacturers. Their results show that efficiency scores and volatility of operational cost and profit are meaningfully influenced by the size and market share of individual companies. Contrary to the above studies Aggarwal and Zhao (2007) used a sample of 27,237 observations regarding financial data from COMPUSTAT's P/S/T and research annual industrial tapes from 1980 to 2003 and proved that, after controlling for industry leverage effects in estimating the leverage-value relationship, leverage is negatively correlated with value for both high and low growth US firms.

3.2 Cost Efficiency of Firms

According to Rudi (2000), in measuring the cost efficiency of firms, one should compare observed cost and output-factor combinations with optimal combinations determined by the available technology (efficient frontier). The method to implement this analysis could be either stochastic or deterministic. The former allows random noise due to measurement errors. The latter, on the contrary, attributes the distance between an inefficient observed firm and the efficient frontier entirely to inefficiency. A further distinction is made between parametric or non-parametric approaches. A parametric approach uses econometric techniques and imposes a priori the functional form for the frontier and the distribution of efficiency. A non-parametric approach, on the contrary, relies on linear programming to obtain a benchmark of optimal cost and production-factor combinations. According to Rudi (2000), it is asserted that there may be differences between specialized and non-specialized firms with respect to the degree of operational efficiency. To test this conjecture, Rudi (2000) estimated a cost function for the different types of firms.

Cost efficiency provides a measure of how close a firm's actual cost is to what a best-practice institution's cost would be for producing an identical output bundle under comparable conditions. The measure is usually derived from a cost function in which costs (C) depend on the prices of inputs (p), the quantities of outputs (y), risk or other factors that may affect performance (z), and an error term ε. The function can be algebraically written as shown in equation (1)

$$c = f(p, y, z) + \varepsilon \quad (1)$$

In equation (1),ε is treated as a composite error term represented as shown in equation (2);

$$\varepsilon = \mu + \nu \quad (2)$$

Where ν represents standard statistical noise and μ captures inefficiency. In the parametric methods, a firm is labelled inefficient if its costs are higher than a best-practice firm after removing random error. The methods differ in the way μ is disentangled from the composite error term ε.

Aigner, Lovell, and Schmidt (1977) proposed stochastic cost frontier in analysis of cost efficiency of commercial firms. In general, the non-parametric methods are less suitable because they assume away noise in the data and luck. But for the purpose of this study, the most important drawback is that these methods generally ignore prices and, thus, can only account for technical inefficiency related to using excessive inputs or producing suboptimal output levels. As Berger and Humphrey (1997) observed, these methods cannot compare firms that tend to specialize in different inputs or outputs because it is impossible to compare input and output configurations without the benefit of relative prices. Moreover, Berger and Humphrey (1997) used the distribution-free approach as well as the stochastic frontier approach for both the trans log and the Fourier specification of the cost and profit function. They concluded that the empirical findings in terms of either average industry efficiency or ranking of individual firm are similar across methods. In equation (2), the random error term (ν) is assumed to be normally distributed and the inefficiency term (μ) is assumed to be one-sided. Either of the approaches (the half-normal and the exponential distribution approaches) can be used with similar results being reported in both cases. The model below has focused on the half-normal distribution. The inefficiency factor (μ) incorporates both allocative inefficiencies from failure to react optimally to changes in relative input prices, and technical inefficiencies from employing too much of the inputs to produce the observed output bundle. The log-likelihood function is given arithmetically by equation (3). The model can be estimated using maximum likelihood techniques.

$$\ln L = \frac{N}{2} In\left(\frac{2}{\pi}\right) - N\ In\sigma - \frac{1}{2\sigma^2}\sum_{i=1}^{N} In\left[\phi\left(\frac{\varepsilon_i \lambda}{\sigma}\right)\right] \quad (3)$$

Where $\varepsilon_i = \mu_i + \nu_i$; $\sigma^2 = \sigma_\mu^2 + \sigma_\nu^2$; N = the number of firms and Φ (.) = the standard normal cumulative distribution function. Inefficiency measures are calculated using the residuals after the model is estimated. For the half-normal case, an estimate of the mean inefficiency is given by

$$\hat{E}(\mu_1) \equiv \left(\frac{2}{\pi}\right)^{1/2} \hat{\sigma}_u \quad (4)$$

Where: $\hat{\sigma}_u$ is the estimate of σ_u . Since the distribution of the maximum likelihood estimates is known, the approximate standard error of can be easily computed. Previously, Jondrow et al. (1982) had showed that a firm-level measure of inefficiency is usually given by the mean of the conditional distribution function of μ_i given ε_i. For the normal-half-normal stochastic model, the conditional distribution of μ_1 given ε_i is a normal distribution $N(\mu., \sigma^2)$ truncated at zero, where

$\mu_1 \equiv \frac{\varepsilon_i \sigma_\mu^2}{\sigma^2}$ and $\sigma^2 \equiv \frac{\sigma_\mu^2 \sigma_\nu^2}{\sigma^2}$. This can be seen by adapting for the cost function the equation for production function derived in Jondrow et al (1982). The density function is algebraically illustrated in equation (5).

$$f(\mu_i / \varepsilon_i) = \frac{\frac{\sigma}{\sigma_\mu \sigma_\nu}\phi\left[(\mu_i / \varepsilon_i) - \frac{\varepsilon_i \lambda}{\sigma}\right]}{1 - \Phi\left(-\frac{\varepsilon_{i\lambda}}{\sigma}\right)}, (\mu_i / \varepsilon_i) > 0 \quad (5)$$

The conditional mean $E(\mu_i / \varepsilon_i)$ is an unbiased but inconsistent estimator of μ_i since regardless of the number of observations, the variance of the estimator remains non-zero.

3.3 Operational Efficiency of Firms

The empirical model takes the following general form:

$$Y = f(x_i, \beta) e^{v_i - u_i}$$

Where *Y* is the dependent variable, *f(x)* is the functional form, β is the technical coefficient, *vi* is the random

component which assumed to be identically and independently distributed with mean zero, and *ui* is the inefficiency effect of the firm. A Cobb Douglas logarithmic function was adopted resulting in estimation equation (6). The estimated Cobb-Douglas stochastic frontier Production function is assumed to specify the technology of the firm. It is specified in the form:

$$ln\ Y_i = \beta_0 + \beta_1\ ln\ X_{1ij} + \beta_2 ln\ X_{2ij} + \beta_3 ln\ X_{3ij} + \beta_4\ ln\ X_{4ij} + V_{ij} - \mu_{ij} \quad (6)$$

Where 'ln' represents logarithm to base *e*; subscripts *ij* refers to the *j*th observation of the *i*th firm; Y = value of total output of the firm in sales; X_1 = total assets; X_2 = cost of sales; X_3 = debt financing costs; X_4 = equity cost; V_{ij} = a symmetric error component that accounts for random effects and exogenous shocks. $\mu_{ij} \leq 0$ = a one sided error component that measures technical inefficiency. It is assumed that the technical inefficiency effects are independently distributed and μ_{ij} arises by truncation (at zero) of the normal distribution with mean μ_{ij} and variance, δ_2, where μ_{ij} is defined as:

$$\mu_{ij} = \delta_0 + \delta_1\ ln\ Z_{1ij} + \delta_2 ln\ Z_{2ij} \quad (7)$$

Where μ_{ij} represents the technical efficiency of the ith firm; Z_1 = years of operation; and Z_2 = firm size; $(V_i\text{-}U_i)$ = A composed error term where. V_{ij} is the random error term (statistical noise) and U_i: represents the technical inefficiency. The maximum–likelihood estimates of the β and δ coefficients in equations (6) and (7), respectively was estimated simultaneously using the computer program FRONTIER 4.1. The above model was used for determining the efficiencies of firms in this study.

3.4 Profit Efficiency of Firms

According to Rudi (2000), profit efficiency measures how close a firm comes to generating the maximum obtainable profit given input prices and outputs. Berger and Mester (1997) used the concept of alternative profit efficiency to relate profit to input prices and output quantities instead of output prices. Alternative profit efficiency compares the ability of firms to generate profits for the same level of outputs and thus reduces the scale bias that might be present when output levels are allowed to vary freely. If customers are willing to pay for high-quality services, the offering firms should be able to earn higher revenues that compensate any excess expenditure and remain competitively viable.

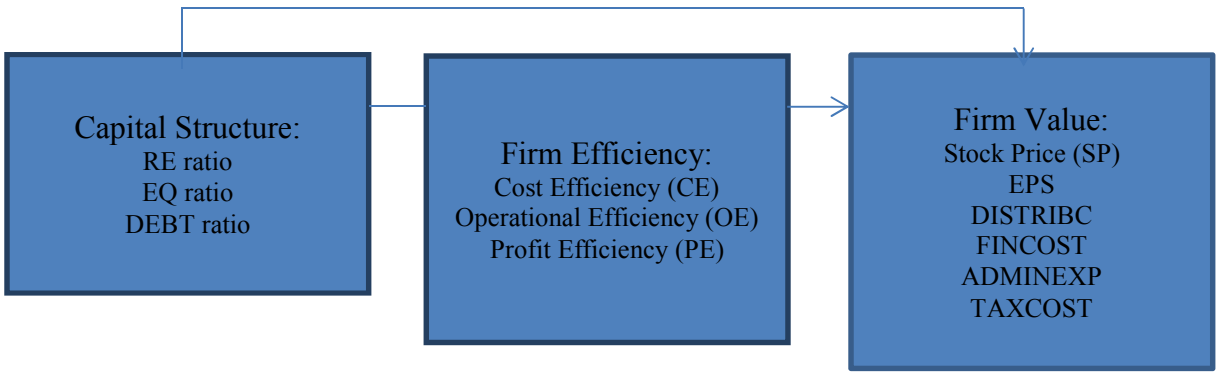
In evaluating profit efficiency, the profit function uses essentially the same specification as the cost function. The dependent variable is now $ln(\pi + |\pi_{min}| + 1)$, where $|\pi_{min}|$ is the absolute value of the minimum value of π in the appropriate sample. In practice, the constant term $|\pi_{min}|+1$ is added to every firm's profit so that the natural log is taken of a positive number. This adjustment is necessary since a number of firms may exhibit negative profits in the sample period. The dependent variable is $ln(1)=0$ for the firm with the lowest value of π. π is calculated as all earnings minus interest and operating costs. The explanatory variables remain unaltered. In this case, π is based on the output-mix combining traditional and non-traditional firm activities. This produces a measure of profit efficiency denoted by PE. A PE of 0.8 would mean that a firm is actually earning 80% of best practice profits or that the firm is losing 20% of possible profits due to excessive costs, deficient revenues, or both (Rudi, 2000).

4. Research Methodology

The study employed a descriptive research design by use of panel data analysis based on the fixed effects model. The study used only secondary data collected from thirty (30) non-financial firms listed at Nairobi Securities Exchange for a period of six years from 2008 to 2013. Further the study applied the stochastic frontier technique/approach (SFT/A) to calculate firm efficiencies.

4.1 Conceptual Model

The study is based on the following conceptual model:



4.2 Analytical Models

Panel data analyses were used to examine the extent to which the dependent variable is a function of one or more of independent variables. This was considered to be appropriate since it determines the influence of a single independent variable and several independent variables on the dependent variable.

The models used in the study took the form below:

$y_{it} = \alpha + \beta x_{it} + \lambda_t + v_{it}$ (8)

where y_{it} is the dependent variable firm value, α is the intercept term, β is a $k \times 1$ vector of parameters to be estimated on the explanatory variables, and x_{it} is a $1 \times k$ vector of observations on the explanatory variables: capital structure and firm efficiency, $t = 1, \ldots, 6$ is the number of time periods; $i = 1, \ldots, 30$ is the number of firms. λ_t is a time-varying intercept that captures all of the variables that affect y_{it} and that vary over time but are constant cross-sectionally. An example would be where the firm's characteristics or operation efficiency changes part-way through a sample period. In such circumstances, this change of firm's characteristics may well influence y, but in the same way for all firms, which could be assumed to be all affected equally by the change. The easiest way to deal with such data was to estimate a pooled regression, which involved estimating a single equation on all the data together, so that the data set for y is stacked up into a single column containing all the cross-sectional and time-series observations, and similarly all of the observations on each explanatory variable is stacked up into single columns in the x matrix. Then this equation is estimated in the usual fashion using OLS.

While this is indeed a simple way to proceed, and requires the estimation of as few parameters as possible, it has some severe limitations. Most importantly, pooling the data in this way implicitly assumes that the average values of the variables and the relationships between them are constant over time and across all of the cross-sectional units in the sample. One could, of course, estimate separate time-series regressions for each of objects or entities, but this is likely to be a sub-optimal way to proceed since this approach would not take into account any common structure present in the series of interest. Alternatively, one could estimate separate cross-sectional regressions for each of the time periods, but again this may not be wise if there is some common variation in the series over time. This study employed a time-fixed effects model rather than an entity fixed effects model or the random effects model based on the Akaike Info Criterion (AIC). One would use such a model where it is thought that the average value of y_{it} changes over time but not cross-sectionally. Hence with time-fixed effects, the intercepts would be allowed to vary over time but would be assumed to be the same across entities at each given point in time. The time-fixed effects model is shown in equation 9.To allow for time variation in the intercept terms a least squares dummy variable model was estimated:

$y_{it} = \beta x_{it} + \lambda_1 D_{1t} + \lambda_2 D_{2t} + \lambda_3 D_{3t} + \cdots + \lambda_T D_{Tt} + v_{it}$, $T=6$ (9)

where D_{1t}, for example, denotes a dummy variable that takes the value 1for the first time period and zero elsewhere, and so on.

4.3 Data

This study employed secondary annual data collected from the firms' financial reports from the Nairobi Securities Exchange for the period 2008 to 2013. These included the financing costs, distribution costs, taxation costs, and administration costs of the thirty firms.Firm cost efficiency, operating efficiency and profit efficiency were calculated using the SFA technique discussed in sections 3.3, 3.4 and 3.5. The independent variable capital structure is represented by retained earnings ratio (RETR), equity ratio (EQR) and the debt ratio (DEBTR). The means for RETR, EQR, and DEBTR are 0.29, 0.53 and 0.19, respectively. This implies that firms are relying more on equity than retained earnings and debt. Thus the pecking order is equity, retained earnings and debt. The maximum retained earnings, equity ratio, and debt ratio are 63%, 100%, and 86%, respectively. These data are not normally distributed as showed by the JB statistics.

The dependent variable, firm value, is represented by direct cost proxy administrative expenses (ADEX), distribution cost (DISTC), financing cost (FINCS), taxation cost (TAX), market share price (SP) and earnings per share (EPS). The means for ADEX, DISTC, FINC, TAX, SP and EPS are Ksh 1,339.3M, Ksh 638.3, Ksh 523.3M, Ksh 762.9M, Ksh 71.44 and Ksh 15.7, respectively. These data are not normally distributed as shown by the JB statistics. Firm characteristics are represented by cost efficiency (CSEFF), operational efficiency (OPEFF) and profit efficiency (PREFF). The means for CSEFF, OPEFF, and PREFF are 35.4%, 65.8% and 51.2%, respectively. This implies that on average firms were operating below the cost, production and profit frontiers. The maximum CSEFF, OPEFF, and PREFF are 72%, 89%, and 89%, respectively. The minimum CSEFF, OPEFF, and PREFF are 10%, 14%, and 10%, respectively. These data are not normally distributed as showed by the JB statistics.

Table 1. Descriptive Statistics

	ADEXP	CSEFF	DEBTR	DISTC	EG	EPS	EQR	FINCT	OPEFF	PREFF	RETR	SP	TAX
Mean	1339.3	35.4	0.19	638.3	4.12	15.7	0.53	523.3	65.79	51.16	0.29	71.44	762.9
Median	585.	36.0	0.13	196.5	4.5	3.53	0.52	75.5	67.5	52.0	0.29	31.89	156.5
Maximum	9995	72.0	0.86	6541	5.8	1163	1.06	10014	89.0	89.0	0.63	500	9596
Minimum	2.3	10.0	0.00	0.00	1.55	-10.84	0.14	0.00	14.00	10.0	-0.39	1.75	-5499
Std. Dev.	1946	12.97	0.19	1237.5	1.5721	87.708	0.1420	1296.3	13.807	16.757	0.1503	87.117	1660.1
Skew	2.4095	0.4612	0.9368	2.9367	-0.481	12.556	0.5011	4.4822	-0.9208	-0.3297	-0.904	2.0006	2.3577
Kurtosis	8.5217	3.7296	3.2817	11.120	1.7675	164.48	4.2595	26.855	4.1158	2.8023	5.5570	7.6359	11.625
JB	402.84	10.375	26.924	753.30	18.342	20031	19.431	4870.9	34.774		73.556	281.26	724.81
P	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
SS	241068	6366	33.8	114908	740	2827.6	94.84	94186	11842	9208	51.45	12859	137318
SSq. Dev.	6.8E8	3E4	6.4	2.7E8	442	1.3E6	3.6	3.E8	34127	50267	4.05	1.3E6	4.9E8
Observations	180	180	180	180	180	180	180	180	180	180	180	180	180

Note: ADEXP = Administrative Expenses, CSEFF = Cost Efficiency, DEBTR = Debt ratio, DISTC = Distribution cost, EG = Economic Growth, EPS = Earnings per share, EQR = Equity ratio, FINCS = Financing cost, INFL = Inflation rate, INTR = Interest rate, OPEFF = Operational efficiency, RETR = Retained earnings ratio, SP = Selling price, Tax = Tax paid, TAXR = Corporate Tax rate

5. Data Analysis, Results and Discussion

Data collected was analysed through combination of both descriptive and inferential statistics. Section 5.1 presents the results of correlation analysis and section 5.2 presents the inferential statistics.

5.1 Results of Correlation Analysis

This section presents the results of the correlation analysis of study variables using Pearson's product-moment correlation as displayed in Table 2.

Table 2: Results of Correlation Analysis among Variables

	ADEXP	DISTC	FINC	TAX	EPS	SP	RETR	EQR	DEBTR	CSEFF	OPEFF	PREFF
ADEXP	1.0000											
DISTRIBC	0.8866	1.000										
FINCOST	0.4230	0.4902	1.0000									
TAX	0.7300	0.6109	0.5891	1.000								
EPS	0.2502	0.3803	0.1964	0.0035	1.0000							
SP	0.1423	0.2107	0.1508	0.0661	0.6654	1.000						
RETR	-0.1517	-0.186	-0.109	0.0986	0.1053	0.1241	1.000					
EQUITYR	0.3195	0.2346	-0.051	0.1451	0.2206	0.3946	-0.019	1.000				
DEBTR	-0.1023	-0.022	0.1108	-0.173	-0.229	-0.355	-0.744	-0.653	1.000			
COSTEFF	-0.3511	-0.229	0.0174	-0.137	0.018	0.1909	0.116	0.113	-0.159	1.000		
OPEFF	0.080	0.212	0.162	0.1306	-0.119	-0.252	-0.189	-0.232	0.305	0.179	1.000	
PROFEFF	0.081	0.059	-0.046	0.0781	0.3638	0.3412	0.005	0.016	-0.016	-0.272	-0.212	1.0000

Source: Author 2016 Note: ADEXP = Administrative Expenses, CSEFF = Cost Efficiency, DEBTR = Debt ratio, DISTC = Distribution cost, EG = Economic Growth, EPS = Earnings per share, EQR = Equity ratio, FINCS = Financing cost, INFL = Inflation rate, INTR = Interest rate, OPEFF = Operational efficiency, RETR = Retained earnings ratio, SP = Selling price, Tax = Tax paid, TAXR = Corporate Tax rate

The Pearson product-moment correlation coefficient is a measure of the strength of a linear association between two variables and is denoted by *r*. The Pearson correlation coefficient, *r*, can take a range of values from +1 to -1. A value of 0 indicates that there is no association between the two variables. A value greater than 0 indicates a positive association; that is, as the value of one variable increases, so does the value of the other variable. A value less than 0 indicates a negative association; that is, as the value of one variable increases, the value of the other variable decreases. A value of 1 indicates perfect positive correlation implying that an increase/decrease in one variable is followed by a proportional increase/decrease in the other variable while a value of -1 indicate perfect negative correlation which imply that an increase in one variable is followed by a

proportional decrease in the other variable.

The stronger the association of the two variables, the closer the Pearson correlation coefficient, *r*, will be to either +1 or -1 depending on whether the relationship is positive or negative, respectively (Cooper & Schindler, 2003). According to Sekaran (1992), the Pearson's correlation is used if the variables of the study are measured using either interval or ratio scales. Correlation results are reported at a significance level of 0.05 and 0.01. Table 2 shows that ADEXP, DISTC, FINC and TAX are highly correlated. Also EPS and SP are highly correlated. Therefore, there is a possibility of multicollinearity among these three variables. The approach used in this study to solve this problem is to use each variable at a time when modeling a particular relationship. The remaining variables do not show the existence of multicollinearity.

5.2 Capital Structure, Firm Efficiency and Firm Value

Table 3 displays the results of panel data analyses on the influence of the firm characteristics on the relationship between capital structure and the value of the firm. The results are based on the fixed effects models. Table 1 shows that based on the F-statistics firm characteristics influence the relationship between capital structure and firm value except for SP, EPS and TAX. However, individually operating efficiency, cost efficiency and profit efficiency negatively and insignificantly influences SP at 5% significance level. Moreover, operational efficiency positively influences DISTC, ADEXP and TAX at 5% significance level. Cost efficiency and profit efficiency jointly positively and statistically significantly influence EPS. The effect of operational efficiency is negative and statistically significant. Cost efficiency negatively and statistically significantly affects FINC, DISTC, ADEXP and TAX. The sign on the capital structure variable depends on the specific measure of firm value. While many indicators of capital structure did not change in sign there was a change in the sign of the capital structure variable from negative to positive when ADEXP was used as a measure of firm value. Moreover, there was a change in the sign of the capital structure variables RETR and EQR from positive to negative when FINC was used as indicator of firm value.

The results show that capital structure positively statistically influence firm value as measured by SP and negatively influences firm value as measured by EPS, TAX, and DISTC. This finding can be rationalized by examining the positive effect of capital structure on FINC and ADEXP. When FINC and ADEXP increase as a result of an increase in debt there is a reduction in profits of the company. Consequently, dividends, earnings per share (EPS) and the share price (SP) decline. The negative relationship between capital structure and TAX can be explained as follows. Debt is tax deductible therefore the higher the debt level the lower the tax payable. The results also showed that cost efficiency negatively influences the relationship between capital structure and firm value as measured by the SP through increase in distribution costs, administrative costs in an effort to boost efficiencies in the firm's core processes. Further Operating efficiency negatively and statistically significantly affects the value of the firm through an increase in financing costs, distribution costs, administration costs and taxation costs. Moreover, profit efficiency negatively and insignificantly influences the relationship between capital structure and firm value as measured by the SP. Also it has a positive but statistically insignificant effect on financing costs, distribution costs, administrative costs and taxation costs. Therefore, capital structure insignificantly influences firm efficiency firm value.

Table 3. Effect of Firm Efficiency on the Capital Structure-Firm Value Relationship

Panel A Dependent Variable: EPS				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	51.51884	1402.379	0.036737	0.9707
RETR	0.663131	1407.398	0.000471	0.9996
EQUITYR	0.679681	1403.486	0.000484	0.9996
DEBTR	40.77471	1405.243	0.029016	0.9769
COSTEFF	0.681146	0.511921	1.330570	0.1851
OPEFF	-1.232364	0.496048	-2.484366	0.0140**
PROFEFF	0.253581	0.419598	0.604343	0.5464
Adjusted R-squared	0.023955	Akaike info criterion		11.82601
Prob(F-statistic)	0.177181	F-statistic		1.399386
Panel B Dependent Variable: SP				
C	1502.270	1157.776	1.297547	0.1962
RETR	1431.001	1161.920	-1.231583	0.02198
EQUITYR	1518.179	1158.690	-1.310254	0.01919
DEBTR	1630.257	1160.141	-1.405223	0.01618
COSTEFF	-2.426275	0.422631	5.740876	0.075600
OPEFF	--0.930576	0.409527	-2.272318	0.065384
PROFEFF	-1.166062	0.346412	3.366114	0.102358

Adjusted R-squared	0.325687	Akaike info criterion		11.44268
Prob(F-statistic)	0.000000	F-statistic		8.859575
Panel C Dependent Variable: FINC				
C	1514.291	20237.50	0.074826	0.9404
RETR	-92.00840	20309.93	-0.004530	0.9964
EQUITYR	-967.6091	20253.47	-0.047775	0.9620
DEBTR	1124.856	20278.83	0.055469	0.9558
COSTEFF	-15.27305	7.387441	-2.067435	0.0402**
OPEFF	-3.968956	7.158384	-0.554449	0.5800
PROFEFF	2.641655	6.055152	0.436266	0.6632
Adjusted R-squared	0.069549	Akaike info criterion		17.16475
Prob(F-statistic)	0.015696	F-statistic		2.216340
Panel D Dependent Variable: DISTC				
C	6587.108	19180.03	0.343436	0.7317
RETR	-6888.835	19248.67	-0.357886	0.7209
EQUITYR	-7653.783	19195.16	-0.398735	0.6906
DEBTR	-6816.285	19219.20	-0.354660	0.7233
COSTEFF	-21.73059	7.001424	-3.103738	0.0022***
OPEFF	26.19520	6.784336	3.861130	0.0002***
PROFEFF	7.392321	5.738752	1.288141	0.1995
Adjusted R-squared	0.082976	Akaike info criterion		17.05741
Prob(F-statistic)	0.006786	F-statistic		2.472413
Panel E Dependent Variable: ADEXP				
C	8604.596	29721.56	0.289507	0.7726
RETR	-7635.306	29827.93	-0.255978	0.7983
EQUITYR	-8536.429	29745.01	-0.286987	0.7745
DEBTR	-6876.517	29782.26	-0.230893	0.8177
COSTEFF	-43.20306	10.84948	-3.982041	0.0001***
OPEFF	29.19306	10.51307	2.776834	0.0061***
PROFEFF	6.127907	8.892826	0.689084	0.4917
Adjusted R-squared	0.109733	Akaike info criterion		17.93342
Prob(F-statistic)	0.001112	F-statistic		3.005751
Panel F Dependent Variable: TAX				
C	10105.17	26405.90	0.382686	0.7024
RETR	-9455.557	26500.40	-0.356808	0.7217
EQUITYR	-10997.07	26426.73	-0.416134	0.6778
DEBTR	-11384.47	26459.82	-0.430255	0.6676
COSTEFF	-21.22097	9.639133	-2.201543	0.0291**
OPEFF	23.69290	9.340260	2.536642	0.0121**
PROFEFF	9.465032	7.900763	1.197990	0.2326
Adjusted R-squared	0.034044	Akaike info criterion		17.69685
Prob(F-statistic)	0.110602	F-statistic		1.573517

Note: ADEXP = Administrative Expenses, CSEFF = Cost Efficiency, DEBTR = Debt ratio, DISTC = Distribution cost, EG = Economic Growth, EPS = Earnings per share, EQUITYR = Equity ratio, FINCS = Financing cost, INFL = Inflation rate, INTR = Interest rate, OPEFF = Operational efficiency, RETR = Retained earnings ratio, SP = Selling price, Tax = Tax paid, TAXR = Corporate Tax rate. ***Signicant at 1 %, **significant at 5% and *significant at 10%.

6. Conclusions

Based on the results of the data analysis the study draws the following conclusions. First, capital structure does exert a positive and statistically significant influence on firm value. Second, cost efficiency insignificantly influences the relationship between capital structure and firm value as measured by the SP.Third, operating efficiency negatively and statistically significantly affects the value of the firm. Fourth, profit efficiency insignificantly influences the relationship between capital structure and firm value as measured by the SP.

7. Policy Recommendations

The following policy recommendations can be made from the results of this study. First, the use of debt to

finance firm operations should be increased to maximize the tax shield available to corporations for financing using debt. Currently, firms are relying on costly equity finance and the retained earnings. Second, firms should increase their cost efficiency and operational efficiency. The results demonstrate that the firms are using more inputs for a unit of output compared to the best firm. Therefore, firms must sell their products at higher prices to break even. This means that the outputs of the firms are not competitive in the market. Consequently, the revenues and profits of the firm decline. Dividends paid go down, earnings per share decline and the share prices drop.

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