EFFECT OF FINANCIAL PERFORMANCE ON CAPITAL STRUCTURE OF LISTEED MANUFACUTRING COMPANIES IN KENYA: A PANEL VAR APPROACH

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Abstract
This paper examines the portability of the reverse causality hypothesis between financial performance and capital structure of listed manufacturing firms in Kenya. To achieve this objective, financial performance was proxy by return on assets and return on equity while capital structure was measured by total debt ratio and debt to equity ratios. The data employed covered 7 companies for the period between 2010 and 2016. While the Panel Vector Autoregression was applied and analysed using EVIEWS 10, the Wald granger causality test was carried out to determine the possibility of causality between the variables. The result reveal that past performance does not have significant effect on capital structure as measure by total debt ratio while it was established that capital structure composition of the firms affects their financial performance as measured by return on assets and return on equity. However, employing debt equity ratio as a measure of capital structure, it was established that a bi directional relationship exists between DER and ROA while it was the opposite in the case of ROE. The study therefore concludes that the behaviour of the listed manufacturing firms in their choice of capital structure composition reflects both the efficiency risk and franchise value hypotheses. It therefore, recommends that firms should strive more for returns to enhance the value of the firm to maximize the wealth of the shareholders.

Key words: Capital Structure; Financial Performance; TDR; DER; ROA; ROE; Reverse Causality Hypothesis

1.0 Introduction

Investors and potential investors will be obliged to invest their hard-earned savings in a company that promised to make a return that will change their wealth position at a point in time. However, as sound as this objective is, it will be illusive if the hard-earned resources are not combined for optimum utilization. The essence of capital structure decision is to ensure the right combination of financing resources that will yield maximum return without necessarily hampering the interest of stakeholders

Since the seminal work of Modigliani and Miller (1958, 1963) on the relevance and irrelevance of capital structure, researchers in corporate financial theory have always been interested in the causal effect of capital structure on financial performance and value of the firm. The classical thinking from the theories propounded since then was premised on causal relationship that capital structure choice determines or affect performance thereby impact on the value of the firm (Kraus & Litzenberger, 1973; Meckling & Jensen, 1976; Myer & Majluf, 1984). As a departure from the classical thinking Berger and Bonaccorsi di Patti (2002), suggested the possibility of a reverse causal relationship as reflected in the reverse causality hypothesis. For an instant, debt holders like any other investors always get attracted to profitable and financially sound firms. The theory predicts performance as a factor in explaining the use of debt, which indicates that productive and money-making firms will use more debt (Margaritis & Psillaki, 2010). The reverse of this proposition is that efficient firms may use less debt to minimize their exposure to financial risk (He & Matvos, 2012). That is, the more profitable and liquid the firm is, the lower the leverage usage (Berger & Bonaccorsi di Patti, 2006; Cheng & Tzeng, 2011; Margaritis & Psillak, 2007).

Most research carried out in East Africa, Kenya inclusive shunned the likely effect of performance on capital structure. Their approaches were on capital structure affecting performance (Mwambuli, 2016; Ronoh & Ntoiti, 2015; Githire & Muturi, 2015; Obonyo, 2017; Ogombe & Mungai 2018; Maina & Mwasa, 2014). For instance, Mwambuli, (2016) examines the influence which capital structure on corporate financial performance of listed non-financial companies in East African stock markets. Using a panel data comprising 272 observations including 34 East African non-financial listed firms listed in East African stock markets such as Dar Es Salaam Stock Market (DSE), Nairobi Securities Exchange (NSE) and Uganda Securities Exchange (USE) for a period between 2006 and 2013. Using the Panel Corrected Standard Errors (PCSEs) and Fixed Effect (FE), proxing return on assets (ROA) and return on equity (ROE) as measures of corporate of financial performance, the short term debt ratio (STDR), long term debt ratio (LTDR) and total debt ratio (TDR) were measures to capital structure while size of the firm (SIZ) was included in the analysis as control. The revelation from the anlaysis indicates that capital structure has a statistically significant negative influence on East African listed firm's financial performance that in average profitable listed firms in East African prefers to use internal source of financing in their capital structure as compared to external source of financing.

Ongombe & Mungai (2018), investigated the influence of the choice of capital structure decision on financial performance of sugar sub sector in kenya, examining the effect of financial debt-ratio, debt-equity ratio and weighted average cost of capital on the financial performance of these firms chosen from Kisumu county while the return on equity was provide to represent financial performance. All the three sugar manufacturing firms in Kisumu County were involved using financial analysis and descriptive survey design between 2011 and 2015 while data was analysed quantitatively. Their findings revealed that debt-ratio had a negative insignificant statistical relationship while debt-equity ratio had a significant negative effect on monetary performance of sugar manufacturing firms in Kisumu County as measured by ROE. It also revealed that WACC had positive significant effects with financial performance of the sugar firms.

Obonyo (2017), in his study at assessing the impact that capital structure has on the financial performance of companies listed at the Nairobi Securities Exchange. The study involved a sample 30 companies selected from the agricultural, automobiles and accessories, commercial and services, construction and allied energy and petroleum & manufacturing and allied sectors of the economy. While debt ratio was used in measuring capital structure, financial performance was depicted by earnings per share, return on assets and return on equity over a period of 5 years. The study concluded a weak but positive relationship between capital structure and financial performance of the listed companies

In a similar study by Maina and Mwasa (2014), in their effort at establishing, the effect of capital structure on financial performance of firms listed at the Nairobi Securities Exchange between 2002 and 2011 a causal research design was employed while data was collected from the financial statements of the listed firms. The data so gathered were analysed by the means of panel Regression analysis. Their study findings indicate that debt and equity are major determinants of financial performance of the listed firms while evidence of a negative and significant relationship between capital structure (DE) and performance was concluded. Their study further conclude that firms listed at NSE used more short-term debts than long term.

In contrary to the assertion of capital structure affecting firm performance, Otieno and Ngwaney (2015) used data generated from the sixty-one firms listed at Nairobi Stock Exchange from 1999 – 2012. By applying canonical correlation between 6 variables normally used to proxy capital structure and 7 of such for firm performance, they suggested that the dominant indicator of capital structure to be used in the analysis is the total debt to total asset ratio while book value to market value ratio and asset turnover

were suggested for firm performance. Using these variables, the Generalised Linear Model (GLM) was applied and the findings revealed although marginally supported that the reverse causality hypothesis reflects in the choice of capital structure of firms in the Nairobi Securities Exchange.

Apart from the discrepancies in findings of these studies, the efforts of the duo of Otieno and Ngwaney (2015) only marginally substantiate the presence of a causal relationship between capital structure and financial performance listed firms in Kenya. Therefore, the main objective of this study was to examine the reliability of the reverse causality hypothesis in support of the relationship between financial performance and capital structure of selected manufacturing firms in Kenya. East Africa. In view of this, the remaining part of this study is divided into four sections: section two contains the literature review and three hosted the methodology while sections four and five contain the discussions and conclusions respectively.

2.0 Literature Review

The relationship between capital structure and financial performance remains the major topic in corporate finance literature (Modigliani & Miller, 1958; 1963; Myers & Majluf, 1984; Myers, 1984). The main theories presented in the understanding of the justification behind this relationship are trade-off theory, pecking-order theory, and agency theory. Nevertheless, it has been argued in capital structure and firm performance literature that there exists a bi-directional causal relationship between leverage and firm performance (Demsetz & Villalonga, 2001; Harvey, Lins & Roper, 2004; Rajan & Zingales, 1995). On one hand, the amount of leverage employed by a firm determines how well it would perform. On the other hand, the performance of the firm can determine the proportion of leverage that the firm would employ in financing its operations. In simple terminology, the degree of a firm's efficiency may place it in a better position to replace equity with debt. This leads to the efficiency-risk and franchise value hypotheses of the reverse causation of performance from capital structure introduced by Berger and Bonaccorsi di Patti (2002).

According to these two hypotheses, firm performance can affect its capital structure in two ways, and the two effects are opposite to each other. Berger and Bonaccorsi di Patti (2002) does not actually solve the reverse causality problem, however, they propounded the reverse causality hypothesis to demonstrate how firm performance can affect the firm capital structure. The reverse causality hypothesis was explained through two competing hypotheses, the efficiency risk hypothesis and franchise value hypothesis.

The efficiency-risk hypothesis postulates that more efficient firms choose lower equity ratios than other firms, all else equal because higher efficiency reduces the expected costs of bankruptcy and financial distress (Berger & Bonaccorsi di Patti 2006; Fazle, Tahir, Ahmad & Mohammed, 2016). The efficiency-risk hypothesis claims that higher profitability often reduces the bankruptcy cost of a firm. Because when a firm is performing well, the firm will usually have a high expected return. A high expected return can be seen as a substitute for equity because they can both be used for deduction of potential portfolio risk of the firm. So according to the positive relationship between performance and expected return, and the substitute relationship between expected return and equity, a firm with better performance will tend to use less equity in its capital structure. This hypothesis suggests a positive relationship between a firm's leverage and its performance.

However, the franchise-value hypothesis is an inverse of the efficiency risk in that it focuses on the income effect of the economic rents generated by profit efficiency on the choice of leverage. Under this hypothesis, more efficient firms choose higher equity capital ratios as postulated, to protect the economic

rents or franchise value associated with high efficiency from the possibility of liquidation (Yinusa, Somoye, Alimi and Ilo, 2016). Higher profit efficiency may create economic rents if the efficiency is expected to continue in the future, and shareholders may choose to hold extra equity capital to protect these rents, which would be lost in the event of liquidation, even if the liquidation involves no overt bankruptcy or distress costs. According to Berger and Bonaccorsi di Patti (2006), the franchise-value hypothesis is a joint hypothesis that profit efficiency is a source of rents, and that firm holds additional equity capital to prevent the loss of these rents in the event of liquidation. These two hypotheses discussed to serve as the theoretical basis to test the reverse causality from performance to capital structure in this study.

The on-going debate in the capital structure literature about the effect of financial performance on the capital structure which is theoretically based on the reverse causality hypothesis (Berger & Bonaccorsi di Patti, 2002). Berger and Bonaccorsi di Patti (2006) and Margaritis and Psillaki (2010) both study the effect of leverage on firm efficiency while considering the reverse causality between efficiency and the firm capital structure. The two studies differ in the empirical approach. Berger and Bonaccorsi di Patti (2006) run a two-stage least squares regression, whereas Margaritis and Psillaki (2010), estimate the two parts of the circular relation separately by OLS and use lagged values of the endogenous regressors to achieve exogeneity. Both studies find a positive relationship between leverage and efficiency. This relationship was further evident in ASEAN countries (Adhari & Viverita, (2015), Pakistan (Fazle et al 2016).

In Nigeria similar studies was conducted by Yinusa, et.al (2016), as a departure from proxy efficiency as the performance measure, their study employed return on equity and found support for the franchise value hypothesis. Invariably the study failed to consider other financial performance variables to properly assess the reverse causality situation in Nigeria. Fatoki and Olweny (2017) and Fatoki and Nasieku (2017) carried out further studies on 86 non-financial firms listed on the Nigerian Stock Exchange while the earlier employed earnings per share as a measure of financial performance against capital structure, the later employed return on assets. The two studies were able to establish the presence of the reverse causality hypothesis.

3.0 Methodology and Data

This paper aims to study the relationship between financial performance and capital structure, in view of this, its expedient for us to study dynamism of the relationships and causality. According to accessed literature, study of this nature on the listed firms on the NSE are generalised and not dynamic in nature in Kenya, hence, this study is restricted to 7 sampled manufacturing firms listed in NSE between 2005 and 2016 and the preference of the panel-data VAR method.

4.0 Analysis and Discussion

Table 1: Descriptive statistics

	TDR	DER	ROE	ROA
Mean	0.383045	0.800816	0.118467	0.193641
Median	0.323371	0.529268	0.073256	0.166841
Maximum	2.598079	4.872258	0.582566	0.591718
Minimum	0.026263	0.031143	0.006998	0.038257
Std. Dev.	0.359350	1.036351	0.116889	0.124337
Skewness	3.645756	2.671334	1.898900	0.905260
Kurtosis	20.40972	9.605661	6.379780	3.632458
Jarque-Bera	1217.237	246.6111	88.30787	12.56645
Probability	0.000000	0.000000	0.000000	0.001867
Observations	82	82	82	82

From Table 1 above, it can be observed that the average total debt ratio to total assets and debt equity ratio is 38% and 80% respectively for sampled manufacturing firms while the average of return on equity and return on assets are 11.9% and 19%. This shows that the sample under observation where generating low returns during the period under consideration. The risk associated with the various combination of capital structure indicate about 40% of the total debt to total assets while it was above 100% when debt equity is considered. The later point to the fact that it is not only equity contribution to total assets that makes the TDR risk to remain at 40%. The skewness and kurtosis were also examined while the Jarque-bera test indicate that all the variables fail normality test.

Table 2: Correlation Analysis
Covariance Analysis: Ordinary
Date: 10/15/18 Time: 00:28
Sample: 2005 2016
Included observations: 82

Correlation Probability	TDR	DER	ROE	ROA
TDR	1.000000 -----			
DER	0.725238 0.0000	1.000000 -----		
ROE	0.277524 0.0116**	0.309445 0.0047**	1.000000 -----	
ROA	-0.011716 0.9168**	0.256885 0.0198**	-0.102765 0.3582	1.000000 -----

Included observations: 82
Sample period: 2005 2016
*, ** indicate significant at 1% and 5%

The Pearson coefficient between return on equity and total debt ratio is r = 0.2775 (P value = 0.0116) and thus indicates a weak positive relationship between return on equity and total debt ratio that was significant while the correlation between return on assets and total debt ratio is r = -0.0117 (P value = 0.9168) portending a weak negatively insignificant relation. The correlation coefficient between return on equity and debt equity ratio is r = 0.3094 (P value = 0.0047) and thus that indicates a significantly positive relationship exist between return on equity and debt equity ratio while the correlation between return on assets and debt equity ratio is r = 0.2568 (P value = 0.0198) portending a significantly positively related relationship.

Model specification test

Table 3: Unit root test

Group unit root test: Summary
Series: TDR, DER, BTM, ROA, ROE, RPS
Date: 10/13/18 Time: 23:40
Sample: 1 82
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 3
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.37914	0.0000	6	480
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-6.21254	0.0000	6	480
ADF - Fisher Chi-square	70.5078	0.0000	6	480
PP - Fisher Chi-square	103.359	0.0000	6	486

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

From Table 3 it can be observed that the result indicates that the probability values (0.000) attached to the corresponding statistic output carried out at level for all methods employed in the study were statistically significant. Therefore, the null hypothesis of "non-stationarity" was rejected since the associated *p*-values were less than the conventional 5% statistical level of significance which is consistent with all methods applied for comparison. This is consistent with modelling a Panel VAR.

Table 4: Cointegration test

Kao Residual Cointegration Test
Series: TDR DER ROE ROA
Date: 10/13/18 Time: 23:51
Sample: 2005 2016
Included observations: 82
Null Hypothesis: No cointegration
Trend assumption: No deterministic trend
Automatic lag length selection based on SIC with a max lag of 2
Newey-West automatic bandwidth selection and Bartlett kernel

	t-Statistic	Prob.
ADF	-1.796202	0.5362
Residual variance	0.075291	
HAC variance	0.016730	

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID)
Method: Least Squares
Date: 10/13/18 Time: 23:51
Sample (adjusted): 2006 2016
Included observations: 75 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID(-1)	-0.950863	0.123324	-7.710295	0.0000

R-squared	0.444988	Mean dependent var	-0.008289
Adjusted R-squared	0.444988	S.D. dependent var	0.280388
S.E. of regression	0.208887	Akaike info criterion	-0.280807
Sum squared resid	3.228886	Schwarz criterion	-0.249907
Log likelihood	11.53027	Hannan-Quinn criter.	-0.268469
Durbin-Watson stat	1.962893		

The panel cointegration test in empirical research provides the researcher with a mechanism to determine the long run relationship among the study variables. As can be seen in Table 4 the Kao Residual Cointegration Test indicate a t-value = -17962 (P value = 0.5363). This values suggest that we cannot reject the null hypothesis of no cointegration which means a panel VAR model can be pursued.

Table 5: Hausman Test for Fixed and Random effects

Dependent	Independent	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.	Null Hypothesis	Alternative hypothesis
TDR	ROA	17.109187	4	0.0018	reject	fail to reject
	ROE	16.076841	4	0.0029	reject	fail to reject
ROA	TDR	40.188564	4	0.0000	reject	fail to reject
ROE	TDR	62.182604	4	0.0000	reject	fail to reject
DER	ROA	33.434498	4	0.0000	reject	fail to reject
	ROE	23.874742	4	0.0001	reject	fail to reject
ROA	DER	41.755561	4	0.0000	reject	fail to reject
ROE	DER	56.219622	4	0.0000	reject	fail to reject

H_0: Random effects model is appropriate at 0.05 significant level

Table 5 displays the Hausman specification test results for panel regression equations. The test results show that the chi-square statistics for the three panel equations are statistically significant at 5% level as supported according the p-values of which are less than 0.05. The study, therefore, rejects the null hypothesis that the random effects estimation was appropriate for the model at 0.05 significance level, therefor, the models were estimated using fixed effect model.

Result and Discussion

The panel AVR estimated results are as presented in **table** 6.

	Variable	Coefficient	Std. Error	t-Statistic	Prob.
TDR					
	ROA(-1)	-0.44845	0.433199	-1.03519	0.3050
	ROA(-2)	-0.68805	0.492095	-1.3982	0.1675
	ROE(-1)	-0.857847	0.427705	-2.005699	0.0496**
	ROE(-2)	-0.32333	0.403717	-0.800883	0.4265
ROA					
	TDR(-1)	0.167529	0.068995	2.428126	0.0184**
	TDR(-2)	-0.022118	0.102965	-0.214814	0.8307
ROE					
	TDR(-1)	0.157213	0.060097	2.615988	0.0114**
	TDR(-2)	-0.055454	0.088102	-0.629426	0.5316
DER					
	ROA(-1)	-4.811814	1.059501	-4.541586	0.0000**
	ROA(-2)	-1.618446	1.172496	-1.380342	0.1729
	ROE(-1)	1.330222	1.134139	1.172892	0.2457
	ROE(-2)	-2.1626	1.115038	-1.939486	0.0574
ROA					
	DER(-1)	0.040391	0.018419	2.192876	0.0324**
	DER(-2)	0.020603	0.016911	1.218344	0.2281
ROE					
	DER(-1)	0.038681	0.015473	2.499911	0.0153**
	DER(-2)	-0.005151	0.015466	-0.333055	0.7403

Table 6 above displayed the output of the panel VAR conducted. It shows the relationship that exist between the variables. However, to have a proper interpretation of the causal relationship and Panel VAR post estimation using Wald test was conducted.

PVAR post estimation

However, to test for causality between performance and capital structure and capital structure and financial performance the Wald test was carried out and the results is as presented in **table.** The decision criteria since variables are lagged for two periods following the setting of the null hypothesis as C(4)=C(5)=0 meaning the change in the dependent variable is caused by the two lagged periods of the independent variable at 0.05 level of significance.

Table 7: Wald Test Output

model		Chi-square	**df**	**Probability**
TDR	ROA	2.999085	2	0.2232
TDR	ROE	4.700540	2	0.0953
ROA	TDR	13.80121	2	0.0010**
ROE	TDR	10.00740	2	0.0067**
DER	ROA	23.15963	2	0.0000**
DER	ROE	5.720656	2	0.0572
ROA	DER	8.133832	2	0.0171**
ROE	DER	6.291400	2	0.0430**

A cursory look at Table 7 shows the dependent variables on the column for models showing that 8 models were run to investigate the effect of financial performance on capital structure of the 7 sampled manufacturing firms listed on the NSE. All the independent variables had two lags to reflect the causality or not between them and the dependent variables. Lagging ROA and ROE twice against TDR in models 1 and 2 produced a P value = 0.2232 and 0.0953 > 0.005. The implication of this finding that lag 1 and lag 2 of both ROA and ROE does not jointly cause TDR in their individual models thereby suggesting that performance as measured by the independent variables does not cause TDR. This assertion supports the findings of Fatoki and Olweny (2017) and Fazle et al (2016). This further supports the efficiency-risk hypothesis postulates that more efficient firms choose lower equity ratios than other firms, all else equal because higher efficiency reduces the expected costs of bankruptcy and financial distress (Berger &

Bonaccorsi di Patti 2006; Fazle et. al., 2016). In the same manner, in models 3 and 4 TDR was applied as independent variable against the duos of ROA and ROE. From these analyses it is observed that C4 and C5 representing TDR lags 1 and 2 jointly cause ROA and ROE with a P values = 0.0010 and 0.0067 at 0.05 level of significance thereby supporting the efficient risk hypothesis.

From the 2 models of DER in which the twice lagged ROA and ROE was employed as the independent variables. The results indicate that the lag 1 and lag 2 of ROA jointly cause DER at p value = 0.000 greater than 0.05. This data reflects the franchise-value hypothesis in the attitude of the firms under consideration in that it focuses on the income effect of the economic rents generated by profit efficiency on the choice of leverage. Under this hypothesis, more efficient firms choose higher equity capital ratios as postulated, to protect the economic rents or franchise value associated with high efficiency from the possibility of liquidation (Yinusa, et. al., 2016). However, ROE suggests a non-causality relationship at p value = 0.572. Invariably a probe into models 7 and 8 of ROA and ROE with the DER and predictor in all cases revealed that twice lagging DER jointly caused changes in the dependent variables as displayed in Table 7. This further reflects the domination of the efficiency risk hypothesis of the reverse causality hypothesis as observed (Fatoki, 2018)

5.0 Summary and Conclusion

The paper focuses on the effect of financial performance of selected manufacturing firms on capital structure in the NSE. It was observed that both efficiency risk and franchise value hypotheses of the reverse causality were reflected in the choice of capital structure composition of the selected firms in Kenya. It was further found out that the sampled manufacturing firms prefer to employ more debt that in equity in their capital structure as it affects profitability more that equity.

References

Adhari, R., & Viverita (2015). Capital structure, ownership concentration and firm performance: Evidence of reverse causality hypothesis in ASEAN countries. *Corporate Ownership & Control, 12(4-4)*, 451-461. http://doi.org/10.22495/cocv12i4c4p3

Berger A. N. & Bonaccorsi di Patti, E. (2002). Capital structure and firm performance: A new approach to testing agency theory and an application to the banking industry being a paper presentation at *JFI/FRBNY/NYU* Symposium on "Corporate Governance in the Banking and Financial Services Industries," October

Berger, A. N. & Bonaccorsi di Patti, E. (2006). Capital structure and firm performance: A new approach to testing agency theory and an application to the banking industry. *Journal of Banking & Finance*, *30*(4), 1065-1102.

Demsetz, H. & Villalonga, B. (2001). Ownership structure and corporate performance. *Journal of Corporate Finance 7*(3), 209–233.

Fatoki, O. I. (2018). Effect of financial performance on capital structure choice of listed non-financial firms in Nigeria. *Unpublished PhD Thesis*, Jomo Kenyatta University of Agriculture and Technology. Department of Economics, Accounting and Finance.

Fatoki, O. I. & Olweny, T. (2017). Effect of earnings per shares on capital structure choice of listed non-financial firms in Nigeria. *European Scientific Journal*. *13*(34): 1857 – 7881. Doi: 10.19044/esj.2017.v13n34p230 URL:http://dx.doi.org/10.19044/esj.2017.v13n34p230

Fatoki, O. I. & Nasieku, T. (2017). The influence of market to book value of equity on capital structure choice in Nigeria. *Scientific Research Journal* (SCIRJ), *5*(11), 18 - 23

Fazle, R., Tahir, A., Ahmad, Z. & Mohammed A. T. (2016). Capital structure and firm efficiency: Case of Pakistan. *Indian Journal of Finance, 10*(2), 50-66.

Granger, C. W. J. (1969). "Investigating causal relations by econometric models and cross-spectral methods". *Econometrica*. 37 (3), 424–438. doi:10.2307/1912791. JSTOR 1912791.

Kraus, A. & Litzenberger, R.H. (1973). A state preference model of optimal financial leverage. *Journal of Finance, 28*, 911–922

Maina, L. & Mwasa, I. (2014). Capital structure and financial performance in Kenya: evidence from firms listed at the Nairobi securities exchange. *International Journal of Social Science and Entrepreneurship.1*(11), 209-223.

Margaritis, D., & Psillaki, M. (2007). Capital structure and firm efficiency. *Journal of Business Finance and Accounting*, *34*(9-10), 1447-1469.

Margaritis, D., & Psillaki, M. (2010). Capital structure, equity ownership and firm performance. *Journal of Banking and Finance*, *34*(3), 621-632.

Modigliani, F. & Miller, H. (1958). The cost of capital, corporate finance and the theory of investment. *The American Economic Review*, *48* (3), 261-297.

Modigliani, F. & Miller, M. H. (1963). Corporate income taxes and the cost of capital: A correction. *American Economic Review*, *53*(3), 433-443.

Mwambuli, E. L. (2016). Does corporate capital structure influence corporate financial performance in developing economies? Evidence from East African Stock Markets. *International Finance and Banking*,3(1) 98-123.

Myers, S. C. & Majluf, N. (1984). "Corporate Financing and investment decisions when firms have information that investors do not have". *Journal of Financial Economics*, *13*(2), 187- 221.

Myers, S.C. (1984). Finance Theory and financial strategy. *Interfaces*, *14*(1), 126-137. Obonyo, R. O. (2017). The impact of capital structure on financial performance of companies listed at the Nairobi securities exchange in Kenya. *International Journal of Economics, Commerce and Management United Kingdom.* 5(6), Pp 185-198. http://ijecm.co.uk/ ISSN 2348 0386

Ongombe, K. O. & Mungai, J. (2018). Examine Capital structure decisions and financial performance of sugar manufacturing firms in Kisumu County, Kenya. International Academic Journal of Economics and Finance, 3(2), 336-356

Otieno, O. L. & Ngwenya, S. (2015). Bi-directional relationship between capital structure and financial performance of firms listed on the Nairobi Securities Exchange. *Corporate Ownership and Control, 12*(4), 103 - 116.

Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The Journal of Finance, 50*(5), 1421-1460.

Ronoh, C. (2015). Effect of capital structure on financial performance of listed commercial banks in Kenya. A case study of Kenya commercial bank limited. *Strategic Journal of Business & Change Management*. *2*(2)

Studenmund, A. H. (2017). *Using econometrics: A practical guide (*7th ed). Boston: Pearson Yinusa, O. G., Russell, O., Somoye, C., Alimi, O. Y. & Ilo, B. M. (2016). Firm performance and capital structure choice of firms: Evidence from Nigeria *Journal of Knowledge Globalization, 9(1), 1-16.*