RELATIONSHIP BETWEEN BOARD CHARACTERISTICS AND CAPITAL STRUCTURE AMONG COMPANIES LISTED IN EAST AFRICA

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Abstract

There is an existing gap on the relationship between board characteristics and capital structure among companies listed in East Africa. Using correlation research design, the study sought to investigate the relationship between board characteristic and capital structure in 2009 to 2013. Specifically the study established the relationship between capital structure and board size, board independence, CEO duality as well as education diversity moderating effect. The sample of this study was 78 listed companies in East Africa (56 in Kenya, 8 in Uganda, 14 in Tanzania). The study was based on secondary data which was collected from the published annual reports for listed companies spanning five years (2009-2013). Fixed effects regression analysis was used together with descriptive statistics such as mean, median and standard deviation was used to summarize the data. The results revealed that there was a positive significant relationship between board size, independent directors, education diversity and capital structure. There is an inverse significant relationship between CEO duality and capital structure. There is need to promote board independence, increase board size to the optimal size and discourage CEO duality.

Key words: Corporate firm performance, Dividend, Investment, Leverage.

1.0 Introduction

The significance of choosing the appropriate capital structure is paramount in any corporate organization. The corporate organizations are mostly run by board of directors on behalf of the shareholders. Every corporate organization aims at maximising the shareholders wealth which can be influenced by the capital sources which is associated with the cost thus board of governance must make decisions aimed at increasing the shareholders wealth. Heng, Azrbaijani and San (2012) argued that an organization board of directors is composed of individuals with heterogeneous characteristics who are appointed by shareholders to run a company on their behalf. These appointees should make independent decisions since they will have significant influence on company's sustainability. Saad (2010) as cited in Heng *et al*, (2012) stated that through the board of directors an organization can minimize agency costs since through the board of director's

355

organization can corporate governance which will yield efficient regulatory and controlling mechanism. Capital structure, according to Margaritis and Psillaki (2010) refers to mix of debt and equity capital maintained by a firm with different sources of funds, particularly to the long-term funds/capitals. To them, it is a framework, which shows how equity and debt is used for financing firms operations. They argue that it is important to find an optimal capital structure or optimal combination of debt and equity since capital structure maximizes the value of the firm. They therefore claim that, the main purpose of capital structure is to know the optimal mix of debt and equity. Hasan and Butt (2009) investigated the impact of ownership structure and corporate governance on capital structure of Pakistan listed companies, the study findings showed an inverse significant relationship between board size and debt to equity ratio. Moreover, the study showed an inverse significant relationship between managerial shareholding and capital structure. Duca (2013) investigated the role of board structure on capital structure among listed companies in Romania, the study findings showed a positive significant relationship between board size and capital structure, while both board independence and CEO duality had positive but insignificant relationship with capital structure. Chaabouni and Jarbouri (2013) investigated the integration between board of director's structure and capital structure among companies listed in Tunisia, results of the study showed a positive significant relationship between board size, board independence and capital structure while duality had a negative insignificant relationship. Priya and Nimalathasan (2013) investigated the relationship between board characteristics and capital structure among selected hotels and restaurants in Sri Lanka. Board characteristics was defined as board of directors meeting, inside directors, CEO duality, board composition, board composition and board size and capital structure was defined as debt ratio and equity ratio. Results of the study showed a positive insignificant relationship between board of management meetings and debt ratio, positive significant relationship between CEO duality, board of directors committee, board size and debt equity ratio. In addition, there was a positive significant relationship between CEO duality, board size and equity ratio. Vakilifard, Gerayli, Yanesari and Ma'atoofi (2011), investigated the effect of corporate governance on capital structure case of listed companies in Iran. Board characteristics were defined as board size, CEO duality and outside directors and capital structure was measured as the ratio of total liabilities to total assets. The study findings showed that there was a negative significant relationship between capital structure and board size and CEO duality had a positive significant relationship with capital structure. In addition, there was a positive insignificant relationship between outside directors and capital structure. bGaniyu and Abiodun (2012) investigated the impact of board characteristics on capital structure decisions among companies listed in Nigeria. Board characteristics was defined to be composed of board size, board composition, board skills and CEO duality and capital structure was measured using the ratio of total debt to total debt plus equity. Results of the study showed a positive insignificant relationship between board size and capital structure and negative insignificant relationship between board composition, CEO duality, board skills and capital structure. Ogbechie (2012) investigated the key determinants of effective board of directors- evidence from Nigeria. There was an insignificant relationship between CEO duality, board independence, board size and capital structure. Agyei and Owusu (2014) defined board characteristics as ownership Structure, board size, non-executive directors and CEO duality and capital structure was measured using the ratio of total debt to total equity. The study findings showed a positive significant relationship between board size and capital structure. In addition, there was a positive insignificant relationship between board composition,

institutional shareholding, managerial shareholding and capital structure. In addition, there was an inverse insignificant relationship between CEO duality and capital structure.

1.2 Statement of the Problem

There are four key decisions which organization management should continuously evaluate; they are financing decisions, investment decision, working capital decision and dividend decision. Public listed companies' shareholders recruit board of management to manage and make the four key decisions on their own. Financing decision is paramount since it influences the other three decisions significantly because if a firm employs expensive sources of finance then there are chances that it may not be in a position to invest in profitable projects which will impact negative the dividend decision. Empirical studies for example (Jaradat, 2005; Velnampy, 2013; Akbari and Rahmani, 2013; Pamba, 2013)   have shown that board characteristics influences the choice of capital structure decision among listed and non-listed companies. Although, these studies have shown significant relationship between board characteristics and capital structure the choice of ordinary least squares method as the data analysis technique was not appropriate thus the current seeks to apply fixed or random effect analysis on panel data across firms listed in East Africa securities exchanges.

1.3 Research Objective
1.3.1 General Objectives

The main objective of the study was to investigate the relationship between board characteristics and capital structure among listed companies in East Africa securities exchange.

1.3.2 Specific Objectives

Specifically the study will be guided by the following objectives:

i.   To establish the relationship between board size and capital structure among companies listed in East Africa securities exchanges.

ii.   To find out the relationship between number of independent directors and capital structure among listed companies in East Africa securities exchange.

iii.   To find out the relationship between CEO duality and capital structure among companies listed in East Africa securities exchange.

iv.   To investigate relationship between education diversity and capital structure among companies listed in East Africa securities exchanges.

1.5 Research Hypothesis

The study seeks to test the following hypothesis:

i.   There is no significant relationship between board size and capital structure among companies listed in East Africa securities exchanges.

ii.   There is no significant relationship between number of independent directors and capital structure among companies listed in East Africa securities exchanges.

iii. There is no significant relationship between CEO duality and capital structure among companies listed in East Africa securities exchange.

iv.   Education diversity has no significant relationship with capital structure among companies listed in East Africa Securities Exchange.

2.0 Review of Literature

This section analyses literature related to the relationship between board characteristics and capital structure. The main source of literature is past studies and a detailed study of the four objectives which include: to establish the relationship between board size and capital structure, to find out the relationship between number of independent directors and capital structure, to determine the relationship between education diversity and capital structure and to find the relationship between CEO duality and capital structure among listed companies in East Africa securities exchange. In addition the study has the conceptual framework, theoretical review, research gaps and summary of the literature.

2.1 Theoretical Framework

2.1.1 Stewardship Theory

This theory was brought forth by by Donaldson & Davis in 2008. It argues that human beings are social beings and their needs are interrelated therefore management and shareholders share the same dream of improving an organization performance, (Arthurs & Busenitz, 2003), therefore public listed management will only undertake projects with similar risk preferences as their owners. Therefore, the management will ensure the board composition adheres to the guidelines as stipulated by board characteristics act in their respective country by using the stipulated board size and mix of executive and non-executive directors. They contended that the theory is the key pillar of organization regulation and better legislation in board characteristics. Consequently, with effective management which ensures adherence to board characteristics an organization will only use a combination of debt and equity which maximizes the shareholders wealth and minimizes the total cost associated with capital acquisition.

2.1.2 Free Cash Flow Theory

Free cash flow theory assumes that there is always cash in companies after expenditure in repair and maintenance. Jensen (1986) argued that if FCF is positive then the firm's cash flow exceed the expenditure on repair and maintenance otherwise the firms ought to seek alternative finances to meet their needs. If management is exposed to excess cash flow then they ought to invest the money

on projects with marginal profits, in contrast they must for cheap sources of finance to meet their deficit. There will always be conflicting interest between shareholders and management on how to distribute the available resources within an organization. The theory is appropriate for the study since the management ought to decide on how to meet their financing deficits which trigger changes on the capital structure.

2.2 Conceptual Framework

A conceptual framework is a schematic presentation of the variables under investigation. In the current study the relationship between dependent variable capital structure and independent variables board size, board independence and CEO duality is summarized as shown in Figure 2.1. The study hypothesizes that there is a relationship between board characteristics and capital structure among the listed companies in East Africa securities exchanges.

Independent variables   **Dependent variable**

| Board size |
| • Number of board members |

| Independent directors |
| • Number of non-executive directors |

| CEO duality |
| • CEO serves as board chair |

| Capital Structure |
| • Total liabilities to total assets |

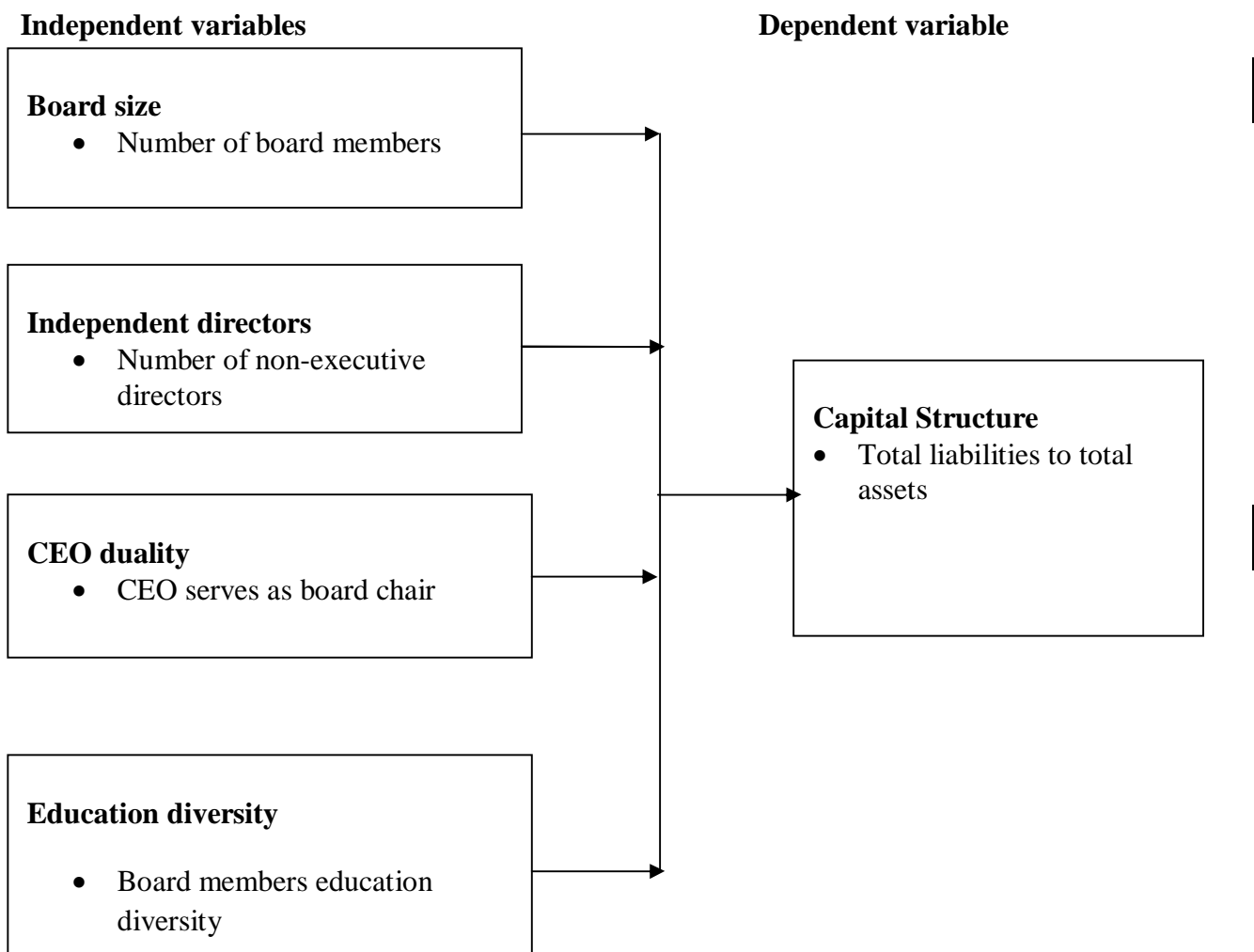| Education diversity |
| • Board members education diversity |

Figure 2.1 Conceptual Framework

2.3 Empirical Review

2.3.1 Board size and Capital Structure

Jaradat (2015) investigated the relationship between board characteristics and capital structure among listed companies in Amman securities exchange. Probabilistic sampling technique was used to select the firms listed with exclusion of financial firms owing to their differentiated capital structure. The study considered panel data for a period ranging in 2009 to 2013. Although there are were 140 companies listed at the securities exchange only 129 which had complete data were considered. The study adopted correlation design to investigate the causal effect of the study variables. Data was analysed using both descriptive and multiple linear regression analysis. Results of the study showed a positive significant relationship between board size and capital structure (ratio of total liabilities to total assets). The choice of ordinary least squares method to investigate the relationship was not appropriate since the data was panel, therefore the most appropriate model would have been either fixed or random effects after testing the effects using Hausman test. In addition, it would have been appropriate to investigate the stationarity using unit root so that the researcher can investigate whether proceeding period's patterns can be investigated from the historic trends. Uwuigbe (2014), investigated the relationship between board characteristics and capital structure among listed companies in Nigeria. The study adapted correlation design. Non-probabilistic random sampling technique to select 40 companies which had consistently traded for years 2006 to 2011. The study adopted ordinary least squares technique. Results of the study showed that there is a negative significant relationship between board size and capital structure (debt to equity ratio). The choice of OLS was not appropriate since the data was panel time series it would have been appropriate to use fixed or random effects regression model after testing the appropriate model using Hausman test. Velnampy (2013), investigate the relationship between board characteristics and capital structure among manufacturing companies listed in Sri Lanka in 2008 to 2012. The study adopted purposive sampling technique to select only the manufacturing companies. Ordinary least squares was used to show the nature of the relationship between capital structure and board characteristics, the choice of the model was not appropriate since the data was time series. Pearson correlation was used to show the strength of the relationship between capital structure and board characteristics. The study findings showed that there is a negative insignificant relationship between board size and capital structure. Chitavi *et al,* (2013) investigated the relationship between capital structure and board characteristics practices among non-listed non-financial firms on Nairobi securities exchange in Kenya. The study adopted correlation design. Non-probabilistic random sampling was used to select 30 companies for 5 years in 2007 to 2011. Capital structure was measured using long term debt to total assets ratio, short term debt to total asset ratio, debt to equity ratio, total debt to total asset ratio. Results of the study showed an insignificant relationship between board size and short term debt ratio as well as with debt equity ratio, positive insignificant relationship between board size and long term debt ratio as well as with total debt equity ratio. The study ought to have adopted fixed or random regression analysis since the data was panel time series. A case of listed companies in Dutch showed a positive significant relationship between debt equity ratio and board size (Ganzeboom, 2014). Bodaghi and Ahmadpour (2010) showed an inverse significant relationship between board size and capital structure among Iran listed companies. Although in Ganzeboom, Bodaghi and Ahmadpour showed

significant relationship they used OLS they should have applied either fixed or random effects regression model.

2.3.2 Number of Independent Directors and Capital Structure

Bodaghi and Ahmadpour (2010) investigated the relationship between board characteristics and capital structure among Iranian listed companies. Non-probabilistic sampling technique was used to select a sample 42 listed companies within a period of 6 years. OLS regression analysis was used to investigate the nature of the relationship between percentage of non-executive directors and capital structure measured as a ratio of debt to equity. Results of the study showed a positive insignificant relationship between percentage of non-executive directors and capital structure. The choice of non-probabilistic sampling technique was appropriate since the study had specified inclusion and exclusion criteria. In contrast the choice of OLS was not appropriate since the study variables had been observed over a period of six years for every company. Akbari and Rahmani (2013) investigated the influence of board characteristics ownership structure on capital structure among companies listed in Iran. Non-probabilistic sampling technique was used to select 78 non-financial firms listed between in Tehran stock exchange. The study adopted fixed effects regression analysis to investigate the relationship between non-executive directors and capital structure. Results of the study showed a negative significant relationship between non-executive directors and capital structure. The choice of fixed effect regression analysis was appropriate since the data used in the study was panel time series. Javeed, Hassan and Azeem (2014) investigated the interrelationship among capital structure, board characteristics measures and firm value: panel study from Pakistan. Non-probabilistic sampling technique was used to select non-financial firms listed in Karachi securities exchange in 2008 to 2012. Since the data was panel balanced the choice of fixed effects regression analysis was appropriate. Results of the study showed an inverse insignificant relationship between non-executive directors and leverage. Pamba (2013) investigated the effect of ownership structure and board characteristics on capital structure decisions of firms listed on the NSE. The study adopted correlation design. The study adopted pooled regression analysis. Results of the study showed that there is a negative insignificant relationship between non-executive directors and leverage. The choice of pooled regression analysis since the data was panel time series.

2.3.3 Education Diversity and Capital Structure

Abor and Biekpe (2008) investigated on whether board characteristics influences capital structure determinants among SMEs in Ghana. Non-probabilistic sampling technique was used to select SMEs in Ghana for six years in 1998 to 2003. The study used panel data analysis to investigate the influence of board characteristics on capital structure. The choice of the panel methodology was appropriate since the data was panel time series. Findings of the study showed that there is a significant relationship between board skills and capital structure. Ganiyu and Abiodun (2012) investigated the impact of board characteristics on capital structure decision of Nigerian firms. The study adopted correlation design. Secondary data was collected annual reports of listed companies in Nigeria. The study adopted panel time series analysis, fixed effects regression analysis to test the relationship between board skills and capital structure. There was a negative significant relationship between board skills and capital structure. The choice of fixed effects regression was appropriate since Hausman test was significant since the p value was less than 0.05.

2.3.4 CEO Duality and Capital Structure

CEO duality is a corporate management approach in which board chairman is also the chief executive officer. Both chair and CEO has influential role on organization financial decision. Both CEO and board chairman are involved in the decision of initiating and execute new investment proposals. Moreover, both are involved in monitoring and controlling new project execution. In order, to operate optimally there is need for organization to operate in a well-coordinated manner thus there is need to separate the roles of CEO and chairman role. Agyei (2014), showed an inverse insignificant relationship between CEO duality and capital structure. Abor and Biekpe (2008), showed a positive significant relationship between CEO duality and capital structure. Saeed *et al,* (2014), investigated capital structure and its determinants: Empirical evidence from Pakistan's pharmaceutical firms. Non-probabilistic random sampling technique was used to select pharmaceutical companies. Secondary data was collected from annual statements from 2004 to 2011. Since the data was panel the study adopted fixed effects regression modelling. Results of the study showed that there was a positive insignificant relationship between CEO duality and capital structure. The choice of fixed effects regression analysis was appropriate since the data was time series. Emamgholipour *et al,* (2013), investigated the effect of CEO duality on capital structure among listed companies in Tehran securities exchange. Secondary data was collected from annual statement of listed companies, in 2006 to 2010. Panel regression analysis was applied. Results of the study showed that there is a significant positive relationship between CEO duality and capital structure (total debt to total assets ratio). Heng and Azrbaijani, (2012) in their study investigated the relationship between board characteristics and capital structure. In this study, 75 companies listed in the Kuala Lumpur Stock Exchange during the years 2005-2008 have been selected as statistical sample. The results show that board characteristics such as board size and board independence have an important role in determining financial composition of companies. But it was not observed negative relationship between CEO duality and capital structure. Moreover, Fosberg (2004), in his study realized the negative and significant relationship between CEO duality and the amount of corporate debt. But on the other hand, Abor (2007) found that there is positive and significant relationship between debt ratio of company and the CEO duality.

2.4 Research Gaps

Both private and public listed companies should evaluate their capital structure as well as their adherence to board characteristics guidelines especially in relation to board composition. Since the board of management acts as shareholders agents their composition should be evaluated fully as such to ensure that the company leaps the maximum benefits associated with their leadership. Board of management characteristics influences the companies choice of capital structure and since they understand the health status of a firm better as compared to shareholders they should ensure that the maximize returns and minimize the cost associated with the alternative sources of finances. Conclusively, the forgoing literature has exhaustively reviewed issues associated with the board characteristics and capital structure among listed and non-listed companies. This chapter tried to review some scholars' general overview on the relationship between board characteristics and capital structure among listed companies but very little information has been explained in relation to the East African market.

3.0 Research Methodology

3.1 Research Design

Kothari (2007) argued that a research design is a step by step guideline showing how the study objectives will be attained. Since the current study seeks to show the relationship between board characteristics and capital structure, the most appropriate design will be correlation design as stipulated by Oso and Onen (2009). Correlation design is more appropriate if the study seeks to show the causal relationship between dependent and independent variables.

3.2 Sample Procedure and Sample Size

Sampling process is the process of selecting a true representative from the total population. According to Mugenda and Mugenda (2008) sampling technique can be categorized into probability if every individual have an equal chance of being selected or non-probabilistic if there is a subjective selection criteria of individuals from the study population. In the current study non-probabilistic sampling will be used to select companies which are listed and actively trading between 2010 2014 in the three securities exchange. Ongore *et al*, (2015), Tarus and Omandi (2015) drew data across listed companies in Kenya for a five year period. In the current study we will consider unbalanced panel data thus even the firms listed in less than five years will be considered.

3.3 Data Collection Instruments

There is need to develop data collection instrument prior to carrying out the study, Creswell (2008) argued that data collection instrument is primarily meant to "quantify, measure or quantify data under investigation". Currently, we will adopt document check index (DCI) which had been previously applied by Tarus and Omandi (2013). The guide will consist information on country of listing, board size, number of independent directors, highest level of education attained by every board member, CEO duality and capital structure, total liabilities and total assets.

3.4 Data Analysis

The current study seeks to investigate the relationship between board characteristics and capital structure. In detail, financial reports during the five year period will be collected to obtain the necessary financial figures of each firm. Then the data will be transformed into variable's data through calculation as shown in section 3.6.1 of operationalization of variables. The variables will be classified as shown in the conceptual framework; board size, board independence, board members education diversity as measured using Herifendel Index (HI), CEO duality. The data will serve the purpose of testing the relationship between independent and dependent variables –capital structure. Data will be analysed with the use of E-views version 8.

3.4.1 Measurement of Variables

The current sections shows the study variables as conceptualized in the conceptual framework. Capital structure will be measured as the ratio of total debt to total assets; board size will be the actual number of board members in the board, independent directors will be measured by the number of independent directors while CEO duality will be a dummy variable 1 if the CEO is the board chairman, education diversity will be measured using Herifendel Index (HI).

Table 3.1 Measurement of Variables

	Variables	Measures
Y	Capital structure	Total debt to total assets
X_1	Board size	Number of board members
X_2	Independent directors	Number of independent directors
X_3	CEO duality	CEO duality
X4	Education diversity	Education diversity

3.4.2 The Model

In order to test the study hypothesis t-test with a critical value of 1.96 as well as p value with a critical value of 0.05 will be used to test the significance of board size, board independence, education diversity and CEO duality on capital structure. According to Kothari (2011) an independent variable has significant effect if the t statistics is greater than + or – 1.96 or the p value is less than 0.05 from which the null hypothesis can be rejected.

$$y_{i,t} = \alpha + \beta_1 x_{1i,t} + \beta_2 x_{2i,t} + \beta_3 x_{3i,t} + \beta_4 Z_{,t} + \acute{\varepsilon}_{i,t}$$

y= Capital structure, x_1=Board size, x_2= Independent directors, x_3= CEO duality, Z= Education diversity, $\acute{\varepsilon}_{i,t}$= error term

Coefficient of determination measured by R squared will be used to test the model goodness of fit since it will show independent variables explanatory power against dependent variable.

4.0 Findings and Interpretation

4.2 Descriptive Statistics

Jarque Berra test was used to test for data normality, the results revealed that the data was normally distributed since the p values for the variables under investigation were greater than 0.05. Therefore, there was no need for data transformation prior to subsequent analysis; if the data is normally distributed there are minimal chances of outliers. On average the listed companies in East Africa securities exchange used debt capital to finance 53.2% of their financial needs. This implies that there are not highly leveraged. The average board size among the listed companies was 9, with a maximum board size of 21. 73.95% of most company's board members were independent directors; this implies that there were chances of benefit from the pool of diversified skills. There was huge

variation in the level of skills among the board members serving in listed companies since 64% of board members had differing skills.

Table 4.1 Descriptive Statistics

	Capital structure	Board size	Independent directors	Education diversity
Mean	0.532	8.879	0.739	0.64
Median	0.532	9	0.778	0.687
Maximum	0.992	21	0.859	.879
Minimum	0.016	3	0.17	0.21
Std. Dev.	0.234	3.146	0.181	0.155
Skewness	-0.057	1.024	-1.388	-0.682
Kurtosis	2.06	1.457	1.486	1.816
Jarque-Bera	0.572	0.213	0.677	0.081
Probability	0.075	0.096	0.12	0.085
Sum	207.529	3463	288.353	249.603
Sum Sq. Dev.	21.32	3849.34	12.743	9.368

4.2 Correlation Analysis

The study further examined the study variables correlation matrix. There was a positive and significant relationship between board size and capital structure. This implies that an increase in board size increased the capital structure among companies listed in East Africa securities exchange. There was a positive and significant relationship between independent directors and capital structure (rho=0.1439, p value <0.05). This implies a unit increase in independent directorship increases capital structure by 0.1439 units. There was a negative and significant relationship between CEO duality and capital structure (rho=-0.058, p value<0.05). This implies that a unit change in CEO duality decreased capital structure by 0.058 units. It can be deduced that the level of risk averseness changed with duality management style adopted. There was a positive and significant relationship between education diversity and capital structure among company's listed in East Africa securities exchanges (rho = 0.0953, p value <0.05). This implies that a unit change in education diversity increased capital structure by 0.0953 units.

Table 4.2 Correlation Analysis

	Capital structure	Board size	Independent directors	CEO duality	Education diversity
Capital structure	1				
Board size	0.0835	1			
	0.0000	-----			
Independent directors	0.1439	0.0794	1		
	0.0000	0.1177	-----		
CEO duality	-0.0580	-0.2621	-0.161	1	
	0.0000	0.0000	0.001	-----	
Education diversity	0.0953	-0.0093	-0.038	-0.070	1
	0.0000	0.8555	0.456	0.167	-----

4.3 Panel Analysis

In the subsequent section both diagnostic tests and panel regression analysis were carried out.

4.3.1 Diagnostic Test

This section reports the diagnostic tests for panel data analysis. Specifically the section the presents the results for serial correlation, heteroskedasticity, Hausman test among others. To begin the study tested the most appropriate model for the study between simple regression model and random effects. Since the p value was less than 0.05, then there was no significant difference in capital structure among all firms and pooled effects regression modelling was not the appropriate model for the study.

Table 4.3 Chi-Square values for the Breusch-Pagan LM Test

Model	Dependent variable	χ^2-value	p-value
1	Capital structure	15.96	.0000

Results in Table 4.4 shows the test results for time fixed effects, the presence of fixed effects can be eliminated through the use dummy variables or fitting a two way random effects regression model. The findings showed no significant time effects thus, it was not appropriate to fit a two way or introduce dummy variables in the panel regression models.

Table 4.4 Test Results for Time Fixed Effects

Model	Dependent variable	F- value	p-value
1	Capital structure	2.29	0.9791

Finally, both heteroskedasticity and serial correlation tests were carried out. The former was tested using modified Wald test while the later was tested using Wooldridge Drukker test. Results in Table 4.5 showed that there was no heteroskedasticity. Moreover, there was no evidence for serial correlation among the panels (p value > 0.05).

Table 4.5 Result for Heteroskedasticity and Serial Correlation tests

Model	Dependent variable	Test for heteroskedasticity		Serial Correlation	
		χ^2-value	p-value	F-value	p-value
1	Capital Structure	3.15	0.4920	2.607	0.215

Since the data had both cross sectional and time series effects pooled effects regression modelling was not the most appropriate thus panel regression model was the most appropriate. The panel data regression approach had two mutually exclusive modelling approach; fixed effects (FE) or random effects (RE). When the main purpose of the study is to examine independent variables effect overtime the most appropriate model is FE. It assumes that there is collinearity between individual entity and independent variables, thus it must be controlled to eliminate the chances of getting biased estimates. RE assumes that there is no correlation between independent variables and they are random variation across entities. More so the model assumes that there is no collinearity between error term and independent variables and consequently specific entity's time invariant variables acts too as independent variables. To establish the appropriate model to apply when the dependent variable was price earnings ratio, Hausman test was conducted. Results in Table 4.6 indicate that fixed effects model for capital structure fitted better than the random effects model.

Table 4.6 Hausman Test Results

Variables	b (fe)	B (re)	b-B (difference)	SE
Board size	0.005297	0.005268	2.89E-05	0.000417
Independent director	0.181407	0.181791	-0.00038	0.007168
CEO duality	-0.00803	-0.00803	1.36E-06	0.004325
Education diversity	0.150621	0.151747	-0.00113	0.010458

Chi square = 35.62, Prob > chi^2 =0.000

After the Hausman test hypothesis testing was tested using fixed effects regression modelling as shown in Table 4.7. The regression results were used to test the hypothesis as stated in chapter and conceptualised in chapter two. The within r-squared is 36% which means that 36% of the variations within the variables were explained by the model. The between r-squared is 38.34% which means that 38.34% of the variations between the variables were explained by the model. The overall R squared of 36.3% shows that 36.3% of the changes in capital structure can be explained jointly by board size, independent directorship, CEO duality and education diversity. The F statistics was carried out to examine whether at least one of the slope coefficient was non zero. The calculated F statistics was 13.56 and p value = 0.000, this implies that board size, independent directorship, CEO duality and education diversity all jointly influenced capital structure among companies listed in East Africa and at least one of the slope coefficient was non-zero.

The first hypothesis of the study stated that there was no significant relationship between board size and capital structure. The study revealed a positive and significant relationship between board size and capital structure (β=0.005, p value <0.05). This implies that a unit change in board size increased capital structure by 0.005 units.

The second hypothesis of the study stated that there is no significant relationship between independent directorship and capital structure. Results revealed a positive and significant relationship between board independence and capital structure (β=0.181, p value <0.05). This implies that a unit change in board independence increased capital structure by 0.181.

The third hypothesis of the study stated that there is no significant relationship between CEO duality and capital structure. The study revealed there was a negative and significant relationship between capital structure and CEO duality (β=-0.008, p value <0.05).Therefore, it can be deduced that a unit increase in CEO duality decreased capital structure by 0.008 units.

The fourth hypothesis of the study stated that there was no significant relationship between education diversity and capital structure. The findings showed a positive and significant relationship between education diversity and capital structure (β=0.151, p value <0.05). This implies that a unit increase in education diversity increases capital structure by 15.1%.

Table 4.7 Fixed Effects Regression Model on Board Characteristics and Capital Structure

Fixed-effects (within) regression					Number of obs	=	390
Group variable: Company					Number of groups =		5
R-sq:	within = 0.360				Obs per group: min =		78
	between = 0.3834				avg =	78.0	
	overall = 0.3630				max =	78	
					$F(4,381)$	=	13.56
	corr(u_i, Xb) = 0.0172				Prob > F	=	0.000
Variable	**Coefficient**	**Std. Err.**	**t**	**P>t**	**[95% Conf.**	**Interval]**	
Board size	0.005	0.012	2.36	0.004	-0.002	0.013	
Independent directors	0.181	0.0496	2.740	0.006	0.051	0.311	
CEO duality	-0.008	0.018	-2.190	0.005	-0.000	0.077	
Education diversity	0.151	0.076	1.970	0.050	0.000	0.301	
_cons	0.255	0.081	3.170	0.002	0.097	0.414	
sigma_u	0.0064						
sigma_e	0.2322						
rho	0.001						

5.0 SUMMARY CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes and presents the research findings, from the study. It has been organized to provide a summary of the study findings, conclusions, recommendations and areas suggested for further research.

5.2 Summary

Results of the study revealed that 53.2% of the companies listed in East Africa were financed using debt capital. The average board size was composed of nine members of whom 74% were independent directors and their education had an average diversity of 64%. Panel data diagnostic test showed that the most appropriate model was fixed effects. The overall R squared revealed that 36.3% of the variation in capital structure was jointly explained by board size, education diversity, CEO duality and independent directorship. Both correlation and regression analysis revealed that there was a positive and significant relationship between board size, education diversity, independent directorship and capital structure while CEO duality influenced capital structure negatively. There was a positive and significant relationship between board size and capital structure. These findings are in agreement with agency theory whereby there are instances of enjoining new board members to the helm of the company once they act as finance providers. The positive significant relationship between independent directorship and capital structure signifies that as board independence increases the level of risk averseness increases and there are chances of borrowing more finances.The inverse relationship between CEO duality and capital structure indicated that those firms which were headed by the CEO had minimal chances of borrowing more

funds if the CEO was risk averse while those headed by different people had high chances of borrowing owing to differing levels of risk attitudes. The positive significant relationship between education diversity and capital structure supports resources dependency theory which argues that the different pool of experts can acts as a source of differing information which can trigger positive benefits to an organization.

5.3 Conclusion

There is need to increase the number of board members in listed companies as such to reap the optimal benefits associated with board size. Even though board size increase increased the chances of profitability there is need to have an optimal board size which will reflect the specific company needs owing to the related agency cost which may arise from the board size. There is need to increase the number of independent directors among listed companies as such to ensure that listed firms can gain from positive insights and criticisms which will assist the firm to develop capital structure which will ensure there is maximum benefit among listed companies especially if an organization can access cheap sources of borrowed funds and invest them to those projects which impacts the shareholders positively. There is need to eliminate the CEO duality so minimize the agency costs associated with it. The dual leadership may inhibit an organization from benefiting from skills and insights which can be generated from alternative leaders. More so there are chances of dictatorial and skewed decisions if the CEO has no checks and this may hamper the gains made from adoption of corporate governance among companies listed in East Africa. There is need to seek the expatriate from differing people with heterogeneous skills composition as such to benefit from their skills variations.

5.4 Recommendations

From the findings it can be recommended there is need to incorporate corporate governance principles which are aimed at minimizing agency conflicts so as to save the associated agency costs. There is need to have manageable board size which will not interfere and infringe on capital structure decision making in any corporate organization. Quoted companies in east Africa should increase the level of board independence so as to benefit from the skills and expatriate of these board members. More so the board independence should not be so high so as to minimize the chances of delaying decision making in listed companies. Through this board independence companies can benefit from the links from the board members which can assist them to acquire cheap sources of finance. There is need to have differing skills qualifications among board members so that the firm can be benefit from these heterogeneity of education qualification. Further, all board members ought to be encouraged to continuously upgrade their skills to ensure that there are equipped with the minimum qualifications for optimal decision making.

5.5 Suggestion for Further Study

Board characteristics are not limited only to board size, CEO duality, education diversity and independent directorship there are features such as multiple directorship, board tenure among other a similar study ought to be carried out to explain their contribution on capital structure among those companies which are listed in Nairobi securities exchange. The current study was limited to only a

five year period future studies on the same line ought to consider a long period of time. There are different listing segment in Nairobi securities exchange there is moderating effect on capital structure ought to be examined.

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