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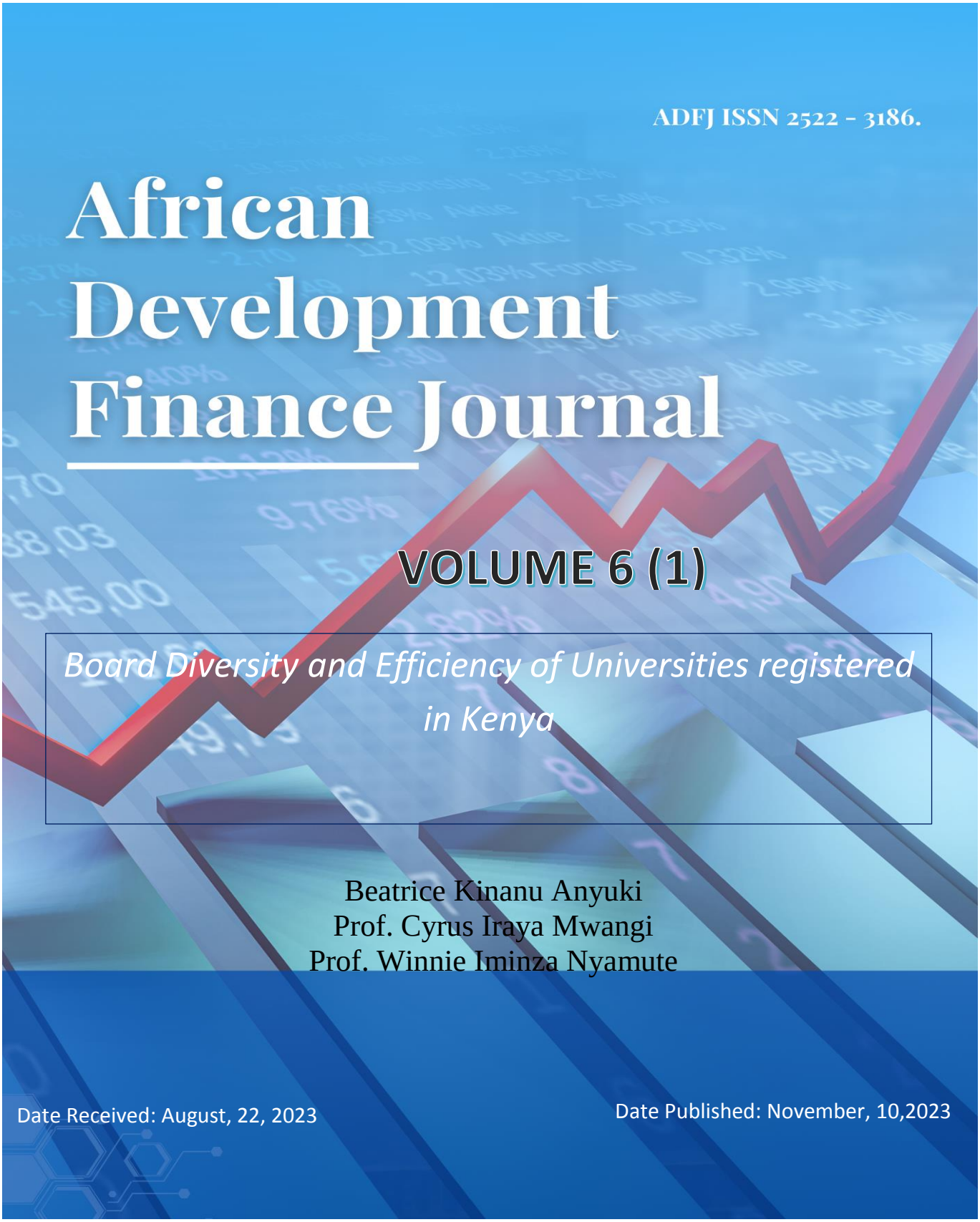

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Board Diversity and Efficiency of Universities registered in Kenya

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Abstract

With the growing recognition of the importance of diversity, it has gained traction as an essential determinant of institutional efficiency. To enhance optimal efficiency, board diversity plays an integral role in minimizing uncertainty, augmenting knowledge sharing, improving resource utilization and crafting overall institutional strategy. The study aimed to determine how board diversity affects the efficiency of universities registered in Kenya. The study was grounded on the agency theory the positivist research paradigm. A descriptive longitudinal research design was employed where a census survey of 75 public and private universities in Kenya was undertaken. Testing of the hypothesis involved the application of the fixed effect regression model as the primary estimation method. The findings indicated a significant relationship between board diversity and efficiency. The results from this research extend the boundaries to the existing knowledge in the concept of board diversity and the efficiency of individual universities in Kenya by identifying the board diversity dimensions that influence efficiency decisions. The conclusions from the study may be useful to the governance models to enhance decision-making among the players in the higher education sub-sector, for instance, to increase efficiency, university boards must make a greater effort to support board diversity and establish the dimensions within the board diversity that are relevant to efficiency enhancement.

Keywords: Board diversity, Efficiency, and Universities registered in Kenya

Introduction

With the growing recognition of the importance of diversity, board diversity has gained traction as an essential determinant of institutional efficiency (Konrad, Prasa & Pringle, 2016). As Hillman and Dalziel (2003) suggested, board diversity enhances better or quality decision-making, leadership and improved innovative ideas, potentially influencing the choice of institutional funding sources. To enhance optimal efficiency, board diversity plays an integral role in minimizing uncertainty, augmenting knowledge sharing, improving resource utilization and crafting overall institutional strategy.

Galia and Zenou (2013), define board diversity as the combination of the directors of a board that is directly categorized based on visible aspects such as gender, ethnicity and age in addition to aspects of education and professional experience that are less visible. A diverse group of persons with diverse aptitudes, skills, and information influence who are eager to dedicate their time professionally constitutes the best board. A

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diverse university board plays a significant role in attaining this anticipated efficiency as they cultivate the frameworks, identify control variables and influence the funding sources (Konrad et al., 2016). To attain efficiency in universities, they are supposed to be governed by professionals who are experienced and well-trained in corporate policy and planning (Ararat, Aksu, Cetin, & Tansel, 2015). It is expected that a diverse university council should uphold all stipulated principles relating to good governance to enhance the efficiency of universities, in addition to oversight of the university management instead of becoming accomplices in mismanagement (Galia & Zenou, 2013).

In measuring board diversity, Strøm D'Espallier and Mersland (2014) used the fraction of the female council members to the sum of members in the councils of universities. Konrad et al. (2016) used the Blau index, while McIntyre, Murph and Mitchell (2007) used the standard deviation of specific indicators to measure the variability of the different attributes around the mean of the summarized features. This study measured board diversity using educational level, ethnicity, board experience, gender, and professional experience. All these are indicators of the Shannon diversity index, which takes into account both abundance and evenness and is suitable when variables are at an interval or ratio scale, which similarly applies to the study.

Efficiency is defined as an optimal situation in a production process where the operational dynamics are such that there is an optimal output for a specified input capacity or nominal input for a specified output level (Barra & Zotti, 2013). Munoz (2016) categorises efficiency in higher education into four key types; allocative efficiency, technical efficiency, overall efficiency and scale efficiency. This study was based on technical efficiency, which is defined as a measure of how efficiently an institution designates the physical inputs available to it to produce a specific level of output, which implies being able to generate the maximum possible production given a certain set of inputs.

The most commonly used techniques to measure organisational efficiency include the Stochastic Frontier Analysis (SFA), which assumes a functional connection between output and inputs, and the DEA. According to Charnes, Cooper, and Rhodes (1978), DEA is described as an arithmetical programming framework employed to observe datasets that offers a novel mechanism of getting estimates of associations, for instance, efficient production possibility surfaces or production functions that form the foundational bedrock of contemporary economies. DEA offers a technique to ascertain the quantity of conservation of

vital resources or output intensification essential for a given decision-making unit (DMU) to achieve efficiency. This is the main frequently applied tool for frontier estimations in productivity evaluation efficiency employed to the entire areas of economic activities.

DEA framework can be decomposed into an output-oriented model, which optimises outputs without needing extra of some of the witnessed input values, and an input-oriented framework, which lessens inputs whilst fulfilling no less than the given output levels. Furthermore, DEA models can also be categorised based on returns to scale by the inclusion of weight constraints. In the beginning, Charnes et al. (1978) suggested the efficiency quantification of the DMUs using the Constant Returns to Scale (CRS), where the entire DMUs operate at the optimal scale. Thereafter, Banker, Charnes, and Cooper (1984) came up with the Variable Returns to Scale (VRS) model of quantifying efficiency, permitting the decomposition of efficiency into scale and technical efficiencies using DEA.

Abbott and Doucouliagos (2004) found DEA to be suitable for quantifying the efficiency of institutions of higher learning due to multiple inputs and outputs regardless of the inexistence of input and output prices. Since this study involves multiple inputs and outputs in institutions of higher learning, it was considered more appropriate to use DEA to measure such institutions. The number of staff members, expenditure and student enrollments are suitable inputs in DEA to assess the universities' technical efficiency, while outputs include the number of graduates and web metric ranking (Myeki & Temoso, 2019). By offering the possibility to use manifold inputs/outputs and leaving out any well-designed form, DEA becomes the most suitable methodology to determine the efficiency of institutions of higher education (Joumady & Ris, 2005).

Research Problem

Among Kenyan universities, some universities have demonstrated higher levels of efficiency in comparison to others. It is, therefore, essential to empirically investigate whether these disparities can be traced to board diversity. Most universities may not operating at an optimal level of efficiency currently due to governance issues. Though board diversity is theoretically linked with improved efficiency, the empirical literature, on the other hand, has been inconclusive owing to mixed findings ranging from positive and neutral to negative linkage.

The absence of convergence in the empirical literature is credited to conceptual, contextual and methodological gaps. At a conceptual level, mixed findings can be attributed to the selection and operationalization of the study variables. There is no universal definition and indicators of board diversity, as well as efficiency owing to the heterogeneity of metrics employed by prior empirical works. Some studies are bivariate, focusing only on board diversity and efficiency, for instance, Adeabah, Gyeke-Dak and Andoh (2019); Alfiero, Cane, Doronzo and Esposito (2019) and Ali, Wang, Jebran and Ali, S. (2021), signifying significant correlation, whereas some studies have integrated moderators, for instance, Coupet (2017); Li and Chen (2018) and Selim and Bursalioglu (2013) and this has contributed to contradictory outcomes.

At the contextual level, mixed findings can be traced to sectorial disparities and variation between the developed and the developing markets based on regulatory, economic, political and cultural settings. Scholars have varied views on the connections between the diversity of a board and efficiency in a corporate set-up; it is however puzzling to notice the limited work on this relationship within a university set-up. At a methodological level, inconsistent findings can be attributed to the choice of econometric or estimation model, the type of data applied (cross-sectional/longitudinal), sampling differences, as well as varying study time frames. Consistent with the research problem, this study addressed these gaps by offering an answer to the research question; what is the relation between board diversity, and the efficiency of universities registered in Kenya?

Research Objective

The objective of this study was to determine the relationship between board diversity and the efficiency of universities registered in Kenya.

Literature Review

This study was anchored on agency theory (AT) propounded by Jensen and Meckling (1976), which suggests that an agency relationship exists when an individual, known as the principal, hires another party as an agent to perform some given tasks on his account. Conflicts may arise between the agent and the principal in the course of their operations. The agents may wish to award themselves a maximum compensation for their efforts; alternatively, if the compensation is certain, reduce their effort. Sometimes agents may take too much risk to the discomfort of the principal. The principal would like to maximize the

output from the agent and, at the same time, minimize the costs of hiring the agent. The disconnect of interests that exist between two parties results in an agency conflict; agency clashes are frequently severe and most repeatedly done in public institutions. The principal-agent problem is most often associated with larger firms, especially universities, where ownership is by the government, parents and financiers, but the university councils and vice-chancellors make most of the decisions (Jerzemowska, 2006).

Based on the agency theory, the diversity of a board leads to better executive monitoring, which leads to improved performance. Moreover, diversity brings a wealth of new ideas, experiences, points of view, and information, typically leading to better decision-making processes (Hillman, 2015). Despite the overwhelming support for diversity within the boards, there still exists an argument that diversity can negatively affect firms, Agency theory points out that increased board diversity tends to inhibit the process of coming up with decisions, and this can influence performance in a negative way (Krishnan & Park, 2005). In addition, increased diversity may result in a clash of opinions and ideas among board members, lowering firm performance (Lincoln & Adedoyin, 2012). To carry out its supervisory role, the board must have the prudent combination of knowledge and the ability to review corporate strategies (Hillman, 2015). AT, therefore, offers the justification for the board's essential role of overseeing administration practices on behalf of the owners, but there is inconsistency in explaining the effect of the diversity of the board on decision-making and hence firm efficiency. From a corporate governance point of view, the management of public universities is monitored by university councils appointed by the government, while that of private universities shall be an individual or a duly registered or incorporated legal entity.

Research by Ali et al. (2021) on the diversity of the board and the efficiency of firms in China revealed that a higher board diversity positively influences the efficiency of the firms. The study employs DEA and Tobit regression on data collected from 2009-2017 from 806 nonfinancial firms. Corporate entities conducted this study and may present different findings if conducted among universities in Kenya. A study by Adeabah et al. (2019) employed a twofold-stage DEA to explore the efficiency of banks and the relationship diversity of the board in terms of gender and the factors influencing bank efficiency. Annual reports from 21 banks were used to compile the data for the study, which spanned the years 2009 to 2017. According to the findings, gender diversity improves the efficiency of banks up to a specific limit of 2 directors (female) on a 9-person director’s board, implying a verge effect on a bank’s efficiency.

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In Alfiero et al. (2019) study, the link between corporate efficiency and board diversity for the year 2015 was examined in 451 European listed manufacturing companies using a slack-based model for DEA that is non-oriented to analyze profitability efficiency and a logit model to ascertain the effect of board diversity on management variables. The findings show that in nations without obligatory gender regulation, a more significant presence of women is related to a greater likelihood of comparatively high efficiency. An empirical investigation was carried out by Khan and Subhan (2019) to examine the nexus between the diversity of the board, firm size, audit quality, and profitability. The study relied on balanced panel data from 100 Pakistani quoted companies from 2008 - 2017. Board diversity was proxied by national diversity, the segment of feminine board members, and the presence of feminine board members. Corporate size moderates board diversity- performance linkage. Audit cost was used as an indicator of audit quality, whereas ROE and ROA were adopted as indicators of performance. Based on the Hausman test, the Random effect model was employed as the principal estimation technique. Empirical findings suggest a noteworthy linkage between board diversity, audit quality, and performance. Furthermore, size moderated board diversity - firm performance relationship.

An empirical review was carried out by Bin Khidmat, Khan and Ullah (2020) to ascertain the nexus between the diversity of a board and the performance of quoted firms in Shanghai for the period 2007 and 2016. The study relied on unbalanced panel data because some firms were listed after 2007. Board diversity was proxied by gender diversity, foreign national diversity, education diversity, independence diversity and age diversity. Firm size moderates the relationship between board diversity and performance. ROA and EPS were used as proxies of performance. The parameters of interest were estimated using the fixed effect model. The study found that gender, education and foreign national diversities have a constructive and substantial impact on performance, while independence and age diversities had trivial effects on performance.

A study by Hasan and Islam (2022) established the effect of board diversity on the profitability of companies quoted on the FTSE 100 Index from 2018 -2021 using panel data. The aim was to probe whether demographic diversity influences the profitability of British-listed entities. The demographic diversity factors in the study included tenure, age, and gender. The study was limited to observable characteristics, and cognitive diversity was omitted. The coefficient of variation index (Blau) was used to delineate demographic diversity, while ROI was used to measure profitability. Hence profitability was only measured

using accounting-based measures. The outcome showed a significant correlation between demographic diversity and profitability. However, the upshots discovered a significant inverse relationship between gender and ROI and a highly positive link with board tenure.

A study by Kabara, Khatib, Bazhair and Sulimany (2022) examined the influence of the diversity of a board on the performance of Nigerian entities using 67 quoted firms for the period 2012 to 2019. Specifically, the inquiry proxied board diversity in the form of educational level and gender using a panel data approach. Firm performance was measured using ROE, the fixed effect model and the Generalized Method of Moments (GMM) to estimate the robustness of the findings. The variance inflation factor (VIF) and a pairwise correlation matrix were carried out to test for multicollinearity. To select between random and fixed effect models, Hausman tests were chosen. Control variables used included firm age and size. The upshots showed a significant positive linkage between both diversity in gender and education diversity on the firm's performance. Morrone, Bianchi, Marsoccia and Faiolil (2022) determined the connection between the diversity of a board and performance utilizing a 3-year data set from 2017 - 2019 comprising 59,229 Italian SMEs. Age, gender, and nationality were used as proxies for board diversity, while performance was operationalized by ROE, ROA, and EBITDA margin. To probe the connection between board diversity and performance, fixed-effect panel regression was adopted. The upshots showed no linkage between the diversity of a board and performance as measured by ROE, ROA, and EBITDA margin. This result was consistent across all three measures meaning that the diversity of a board had a nominal effect on corporate performance.

Using panel data analysis of 30 acquiring companies operating in the industrial sector in Malaysia, Osman, Ibrahim, Zulkafli and Muragayah (2022) carried out a study from 2009 and 2016 to find the interconnection between the diversity of a board and performance. To determine the link between firm performance and board diversity, four variables, including foreign directors, multiple directors, women directors, and independent director education, are used as indicators of board diversity. To proxy performance, ROA was applied. Random effect, OLS, and Fixed Effect models were applied to determine the cause-and-effect relationship between the study variables. The output confirmed a significant inverse interconnection between the board diversity of independent directors with an education degree and below and ROA. However, a significant direct link exists between the share of foreign directors and ROA. These upshots

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signify that board heterogeneity is critical in accomplishing better performance, and firms should encourage and promote a diverse set of people on the directors in a board to attain the best performance.

In a Nigerian, Adegboyegun and Igbekoyi (2022) opted to find the linkage between the diversity of a board and the performance of the quoted firms operating in the country using a purposively selected sample of 64 firms as of 31st December 2020 for the period 2011 to 2020. The research depends on data from secondary sources including reports of the selected firms. The indicators of board diversity included gender, financial expertise, ethnicity, and educational background. The theory underpinning the study was the resource dependence theory, and using different theories may give a variance to the study. Financial Performance was measured using earnings per share (EPS). However, using non-accounting measures may give a different outcome to the study. To estimate the proposed linkage, the panel OLS regression technique was embraced. Findings showed that the diversity of a board has a negligible influence on performance excluding the financial expertise, which has a notable positive correlation. Hence firms need to ensure that a more significant number of their directors have the financial expertise to ameliorate their performance. Extending the study to include non-financial performance may present different findings.

Conceptual Framework

Based on the literature and empirical reviews, a conceptual framework was developed for this study. Scholars perceive a conceptual framework as a hypothesized model that establishes variables in research and shows their relationships. This study seeks to establish the linkage between board diversity and efficiency constructs. The relations between the variables are shown in Figure 1.

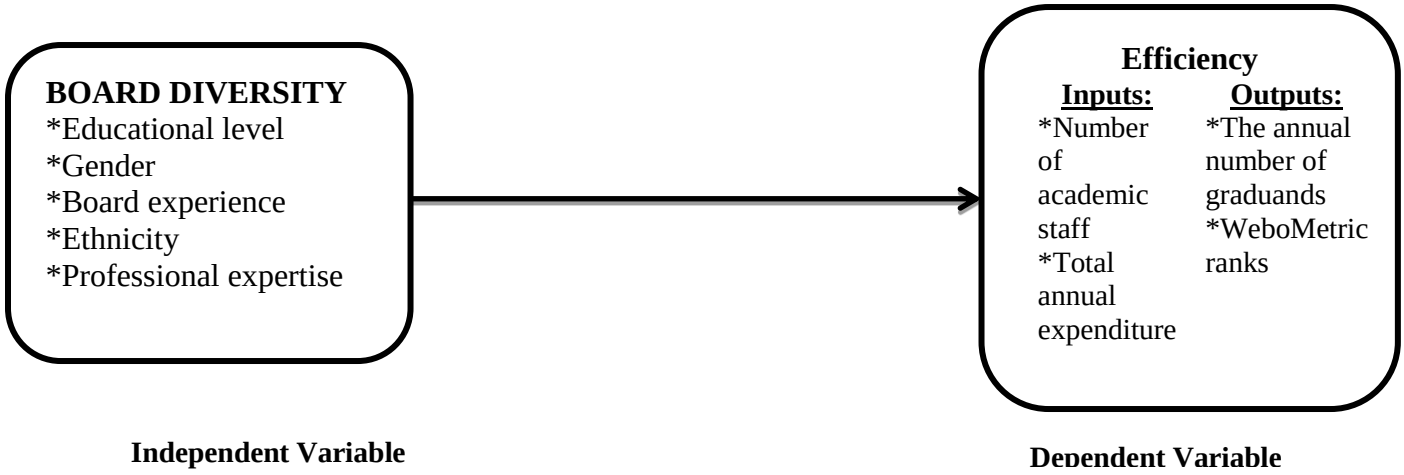

Figure 1: Conceptual Model

The empirical studies led to the formulation of the hypothesis that H01: Board diversity does not affect the efficiency of universities registered in Kenya as presented in conceptual model 1.

Methodology

General Background of Research Methodology

The research methodology discusses the procedures involved in coming up with research findings. It starts by establishing the research philosophy, the research design employed, and the population of the study. The research was anchored on a positivist research paradigm. A descriptive longitudinal research design was employed where a census survey of 75 public and private universities in Kenya was undertaken.

Sample of Research

The target population comprised all 75 Kenyan public and private universities, including the constituent university colleges from 2013 to 2020. The study used a census survey of all public and private universities registered by Kenya's Commission of University Education (CUE). Since in Kenya, there are a relatively small number of universities; the research was based on a census. However, after sorting and cleaning the data from each of the 75 universities, the data considered for the study were from 65 universities operating during the study period with complete data for at least one board cycle.

Instrument and Procedures

The data was collected from secondary sources from the CUE data bank, official university websites and the audited annual reports and financial statements for public and private universities registered by CUE from 2013 to 2020. To observe two cycles in a university council required a minimum of 7 years in the study. A data collection sheet was used to collect and record data from the annual financial statements and reports. The data for each variable obtained from the yearly reports and official university websites was recorded in a data collection sheet to minimise omission and other errors that may result in time-saving during editing and coding. In this study, unbalanced panel data was used since some universities were registered after 2013.

Data Analysis

Descriptive and inferential statistics were used to analyze data in this study. Two stages of analysis were employed: first, computation of efficiency scores using DEA and second, regressing scores on the predictor

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variables. Secondly, to probe the link between the board diversity and efficiency (objective one, hypothesis H01), a general linear panel regression model specified below was applied for estimation purposes;

$EFit = \beta 0 + \beta 1BDit + \text{Ɛ}it$…. … . . …. . … …… … … … … . … … … . … …(1. **1**)

Where: EF = efficiency; BD = board diversity; β0 = regression constant; β1 = coefficient; it = firm i at time t; Ɛ is the error term.

The adjusted coefficient of determination (R2) will be used to establish the model's goodness of fit; T-test will be used to assess the statistical significance of β for each explanatory variable at $p < 0.05$; Beta coefficient (β) is the amount of change in the outcome variable in panel regression analysis for every unit change in the explanatory variable when holding constant all other predictor variables; F-test was be applied to assess the overall model significance.

Findings and Results Discussions

The data was collected over seven years, from 2013 to 2020, and comprises 75 registered universities in Kenya as per the Commission of University Education (CUE). Table 1 shows the descriptive statistics for board diversity proxied by educational level, gender, board experience, ethnicity and professional expertise.

Table 1: Descriptive Statistics for Board Diversity

	Descriptive Statistics										
	N	Min	Max	Mean		Std. Deviation	Coefficient of Variation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Educational level	361	.0849	.1597	.148213	.0008348	.0158610	0.107015	-2.306	.128	5.682	.256
Gender	361	.0000	.1598	.145325	.0013893	.0263975	0.181645	-3.633	.128	5.973	.256
Board experience	361	.0000	.3131	.071298	.0050122	.0452326	0.634416	.892	.128	.599	.256
Ethnicity	361	-8.5882	.3010	.236412	.0246612	.0468563	0.698198	-18.660	.128	.317	.256
Professional expertise	361	.2966	.4771	.422827	.0024762	.0470481	0.11127	-1.047	.128	.288	.256
Valid N (listwise)	361										

Table 1 displays the descriptive statistics for the board diversity (educational level, gender, board experience, ethnicity and professional expertise), including; minimum value, maximum value, mean, Standard Deviation (SD), Coefficient of Variation (CV), kurtosis and skewness. The results show that the mean score of an educational level is .148 with a SD of .0158 and a CV of .107. The CV of 10.7% is low, implying that there is not much variability regarding board members' education level, depicting that they all have almost similar levels of education. Gender has an average mean of .145, and standard deviation of 0.0,2,6 and a low coefficient of variation of 8, .2% implying that among the universities in Kenya, gender in terms of male and female among the board members does not vary highly.

Board experience and ethnicity vary highly, with a coefficient of variation of 63% and 69%, respectively. This depicts that board members of the surveyed universities varied highly in terms of experience and ethnicity, implying that they possessed varied experience and came from different ethnic groupings. Professional expertise had an average mean score of .423, SD of .047, and a CV of 11%. The low level of coefficient of variation implies that board members do not vary much as far as professional expertise is concerned. The results further show that all board diversity dimensions (educational level, gender, board experience, ethnicity and professional expertise) data is skewed to the left except for board experience and is peaked as shown by kurtosis values.

In hypothesis testing board diversity was represented by a composite index computed by aggregating the five indicators: educational level, gender, board experience, ethnicity and professional expertise. On the other hand, efficiency was operationalised using the DEA model where the number of academic staff and total annual expenditure were employed as inputs, whereas the number of graduands and webometrics rankings was utilised as outputs. The null hypothesis (H_{01}) was tested as stated below;

H_{01}: The relationship between board diversity and the efficiency of universities registered in Kenya is insignificant.

For estimation, a general linear model is specified as indicated;

$$\mathbf{EF_{it} = \beta_0 + \beta_1 BD_{it} + \chi_{it}}$$

Table 2: Regression Results of Board Diversity and Efficiency

Source	SS	df	MS	Number of obs	=	361
				F(1, 359)	=	72.25
Model	27.4159432	1	27.4159432	Prob > F	=	0.0000
Residual	136.222266	359	.379449209	R-squared	=	0.1675
				Adj R-squared	=	0.1652
Total	163.638209	360	.454550581	Root MSE	=	.61599

EF	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
BD	.2417058	.0284356	8.50	0.000	.1857846	.2976271
_cons	2.180549	.0893648	24.40	0.000	2.004804	2.356293

The study findings in Table 2 show that board diversity has a significant statistical effect on the efficiency ($\beta = 0.242$, $p<0.05$) of the universities in Kenya, pointing out that for every unit increase in board diversity, the efficiency improves by 0.242 units. The results further show that the response power was moderately significant (the value of R-squared (R^2) is 0.1675), suggesting that board diversity indicators explained 16.75% of the variability in efficiency (dependent variable), whereas other variables explained 83.25%.
The linear regression analysis model of;

$$\mathbf{EF_{it} = \beta_0 + \beta_1 BD_{it} + \zeta_{it}}$$

Where EF= Efficiency, BD=Board Diversity, and ζ_{it} is the error term, was therefore presented as follows;

$$\mathbf{EF_{it} = 2.181 + .242 BD_{it} + \zeta_{it}}$$

This, therefore, implies that if board diversity is varied by one unit, efficiency will vary by .242 units; also, the overall model was found to be significant statistically because the F-test statistic was significant statistically ($F(1, 359) = 72.25$, $p<0.05$). This indicated that the first hypothesis $H_{01:}$ The relationship between board diversity and the efficiency of universities registered in Kenya is not significant, was rejected.

Conclusions and Recommendations

The findings established a significant linkage between board diversity and efficiency. Diversified board members are likely to possess varied individual traits which contribute to different leadership, emotional and thinking approaches hence augmenting efficiency. Furthermore, board diversity leads to optimum utilization of the existing pool of talent as well as improvement of institutional reputation, thus improving

efficiency. Overall, it can be concluded that board diversity has a significant influence on efficiency. To increase efficiency, university boards must make a greater effort to support board diversity and establish the dimensions within the board diversity that are relevant to efficiency enhancement. As a result, board management should be properly formed to align their characteristics to the efficiency scores to enhance their decision-making prowess.

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