RESEARCH PAPER

Efficiency of Universities in Kenya: Does Corporate Governance Matter?

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Abstract

The main role of universities is to be repositories and generators of knowledge, creativity and innovation. As such, universities need to be run efficiently to attain this goal. Despite the critical role of universities in national development, many universities in Kenya continue to experience inefficiencies manifested through governance conflicts, frequent industrial unrest, delayed decision-making, and declining academic quality. However, empirical evidence linking specific corporate governance practices to the efficiency of universities in Kenya remains limited and inconclusive. This study investigates the influence of corporate governance on efficiency of universities in Kenya. This study was based on positivist philosophy and adopts ex post facto research design. The study targeted 48 universities operating in Kenya comprising of 30 public universities and 18 private universities. Secondary data was collected from financial budgets, income and expenditure statements of the universities over the period 2016 to 2021. Data analysis entailed data envelopment analysis and censored regression analysis. Council structure has a significant negative effect on efficiency. In contrast, the frequency of board meetings shows a significant positive effect. Student enrolments, asset base, age of the university, and ownership of the university are also significant determinants of efficiency, with ownership exhibiting a strong negative effect. However, the total number of ethnic groups represented, council remuneration, country economic growth, qualifying high school grade, and student quality do not have a statistically significant effect on university efficiency. The study recommends the need for universities in Kenya to strengthen internal governance mechanisms across all universities.

Keywords: *Corporate Governance, Efficiency, Universities,* Data envelopment analysis

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1.0 Introduction

Universities play a pivotal role in human capital development, research, and socio-economic transformation, yet many universities are experiencing a persistent decline in efficiency characterized by rising operational costs, financial instability, overcrowded facilities, delayed academic processes, reduced research output, and declining quality of graduates (O'Neill & Bagchi-Sen, 2023). This inefficiency is often manifested through suboptimal utilization of resources, weak managerial systems, frequent industrial unrest, and governance challenges that undermine effective service delivery. Despite increased enrolments, continued public, and private investment in higher education, the expected improvements in performance and outcomes have not been realized (Tiron-Tudor et al., 2022). The underlying drivers of declining efficiency remain inadequately understood, particularly in relation to institutional governance. This gap necessitates systematic investigation into the causes of declining efficiency in universities to inform evidence-based policy interventions and strengthen the sustainability and performance of higher education institutions.

While declining efficiency in higher education continue to raise concern, there is a limited conceptual, methodological, or policy clarity in this area (Broucker et al., 2015). As enrolments in higher education continue to expand, public funding is becoming increasingly diluted, particularly as competition increases from other recipients of public funds. Thus, many governments and organizations involved in higher education are implementing strategies to improve the efficiency of universities and ensure that they are properly run (Visbal-Cadavid et al., 2017).

A university is said to be efficient if it is producing maximum output (number of graduates and publications) from a minimum quantity of inputs (number of staff, students' enrolments, and expenditure) (Myeki & Temoso, 2019). In the USA, efficiency measurements of higher learning institutions have become popular replacing output and impact assessments. Data Envelopment Analysis (DEA), Free Disposal Hull (FDH), the order-m and order-α approach are often used in ascertaining the efficiency of universities (Wohlrabe et al., 2018). Efficient universities in the USA often register increased industry funding and academic patenting activity (Foltz et al., 2012). In the case of UK, effectiveness, efficiency and value for money are central concerns for the higher education sector (Universities, 2011). In South Africa, assessing the efficiency of universities is vital for effective allocation and utilization of educational

resources (Myeki & Temoso, 2019). In the case of Tanzanian universities, there is variability of efficiency among universities across years. Tanzanian universities are efficient in generating graduates through available human capital, whereas research publications and consultancy services are influential factors for university efficiency (Bangi et al., 2014). In Kenya, government funding was found to have insignificant effect on operational efficiency of public universities in Kenya (Wachira, 2018).

The effect of corporate governance on the efficiency of universities is grounded in the role governance plays in shaping leadership quality, accountability, and strategic oversight within higher education institutions. However, the management of high education especially in developing countries is facing challenges linked to falling corporate governance (Koeswayo et al., 2024). Corporate governance refers to the structure adopted in controlling and directing organizations (Jiang et al., 2012). It is considered as the most efficient way of supervising the operations of a firm and ensuring the main goal of a firm to maximize shareholders' wealth is taken care of (Honghui, 2017). This implies that corporate governance might have effect on the efficiency of the university.

Efficient and effective corporate governance can broaden the financing channels of enterprises and increase opportunities for enterprises to obtain external financing. It can also optimize the distribution of capital, labor, and other resources to reduce the cost of resource distribution (Efunniyi et al., 2024). Thus, corporate governance is helpful to companies in avoiding a financial crisis and respond more efficiently to crises. The relationship between all stakeholders and labor relations can be improved through corporate governance (Kovvali, 2022). Effective and efficient corporate governance can effectively reduce agency costs and conflicts of interest as well as mobilize employee enthusiasm (Mahato, 2025).

Despite growing interest in the relationship between corporate governance and university performance in Kenya, existing research reveals significant gaps that justify further study (Karinki et al., 2021). Most studies to date have focused on corporate governance's influence on performance or specific governance components such as board diversity or transparency, primarily in public universities, without systematically linking these practices to institutional efficiency outcomes across both public and private sectors (Shabbir et al., 2024). Additionally, the literature exhibits inconsistency in theoretical approaches and empirical findings, with some studies reporting significant effects while others yield mixed or inconclusive results, highlighting a lack of consensus on how different governance mechanisms affect efficiency indicators such as resource utilization, operational processes, and academic outcomes (Shabbir et al., 2020; Kamath, 2019; Scafarto et al., 2020). It is against this that this study sought to establish the influence of corporate governance on efficiency of universities in Kenya.

This study is significant because it provides empirical evidence on how corporate governance practices influence the efficiency of universities in Kenya, a topic that has been underexplored in the local context. The study examines both public and private universities, offering a comprehensive understanding of governance mechanisms across different institutional settings. The findings contribute to the scholarly discourse by linking specific governance factors, such as council structure and frequency of board meetings, to measurable efficiency outcomes. This addresses an existing gap in higher education research where governance has often been studied in relation to performance in general terms, without directly quantifying its impact on operational efficiency.

Finally, the study is valuable to policymakers and the broader education policy community. In Kenya, higher education institutions are critical drivers of human capital development and economic growth, yet inefficiencies in governance undermine their potential. The study informs policy frameworks that promote accountability, transparency, and institutional sustainability. Additionally, the research provides guidance for regulatory bodies on setting governance standards that support resource optimization and effective oversight. These insights can help shape national policies aimed at improving the quality and competitiveness of higher education institutions, thereby benefiting the wider socio-economic landscape.

The remainder of this paper is organized as follows. Section two reviews relevant empirical literature, focusing on prior studies on corporate governance and efficiency, and identifies existing research gaps while section three describes the methodology, detailing the research philosophy and design, study population, data sources, variables measurement, and analytical techniques, including data envelopment analysis, censored regression, and the Malmquist productivity index. Section four presents and discusses the empirical results on university efficiency and the moderating effect of university size. Section five provides the conclusions and study implication to policy and practice.

2.0 Empirical Review

The composition of the governance structure can be used to enhance efficiency among internet companies in China (Shabbir et al., 2020). Board diversity improves technical efficiency and total factor productivity among non-financial firms in China (Ali et al., 2021). This implies that a diverse council might enhance technical efficiency of a university. Similarly, corporate governance factors influence the cost efficiency in Malaysian Takaful industry (Lee et al., 2019). This is an indication that corporate governance might also contribute to cost efficiency within university. Nonetheless, Scafarto et al. (2020) established that board

size and director independence had positive effect on intellectual capital efficiency of family firms and negative effect on intellectual capital efficiency of non-family firms. Thus, it is likely that corporate governance effect on efficiency of universities might differ between private and public universities. However, this need to be established via empirical study. In Kenya, Corporate governance significantly influences university performance (Agili, 2020). A study by Kamath (2019) showed that board size had negative significant effect on efficiency while independence of directors had a positive significant impact on efficiency. This implies that the effect of various characteristics of corporate governance may have different effect on efficiency of universities. Nonetheless, this assertion ought to be supported by empirical data.

Governance in Kenyan universities face many challenges including large student numbers, overstretched facilities, insufficient government support, inadequate induction of new staff, resistance to change and cultures that support impunity on the part of some non-performing employees (Mulili, 2014). This implies that irrespective of the composition corporate governance, challenges facing universities might impact negatively on the efficiency of these institutions. Spanish university stakeholders attach great importance to the disclosure of specific information on aspects of corporate governance, which would result in improved transparency and accountability (Ramirez & Tejada, 2018). Although these studies were concerned with governance in the universities, they did not relate corporate governance and university efficiency.

Empirical studies reviewed demonstrate a broad consensus that corporate governance practices significantly influence organizational performance and, in some contexts, efficiency. Studies by Githu and Minja (2025), Monari (2020), Karinki et al. (2021), Agili et al. (2020), and Vundi (2024) consistently report that governance mechanisms such as board responsibility, transparency, accountability, ethics, and board composition have a positive and statistically significant effect on organizational or university performance in Kenya. Similarly, Kinyua and Ngari (2021) found that although public hospitals complied with governance regulations, partial implementation limited their effectiveness, reinforcing the importance of robust governance practices. This convergence in the literature underscores the central role of corporate governance in enhancing institutional outcomes across public sector organizations.

However, divergence emerges in how specific governance attributes influence efficiency and performance, particularly when efficiency-based analytical methods are applied. For instance, Namagwa et al. (2024, 2025) and Kariuki (2023), using data envelopment analysis and panel regression, reveal mixed effects of board characteristics on efficiency. While employee or member representatives on boards positively influence efficiency, independent board members and larger board sizes are found to negatively affect efficiency, possibly due to coordination challenges or slower decision-making. These findings contrast with studies such as Vundi (2024) and Githu and Minja (2025), which report positive effects of board independence and accountability on performance, highlighting inconsistencies in the direction and magnitude of governance effects depending on context and measurement approach.

Further inconsistencies are evident regarding moderating and contextual variables. Gathitu et al. (2025) found that ethical values did not significantly moderate the relationship between competitive strategies and performance of accredited universities in Kenya, contradicting assumptions in governance literature that ethical frameworks strengthen performance outcomes. International evidence by Peng et al. (2021) confirms the mediating role of technical efficiency between corporate governance and financial performance in Chinese tourism firms, while Tuan Sulaiman and Abdul Ghadas (2021) emphasize that governance models in higher education institutions vary depending on managerial and financial objectives. These differences suggest that governance-performance and governance-efficiency relationships are highly context-specific and not universally generalizable.

Notably, a major research gap across Kenyan university-focused studies is the predominant emphasis on performance rather than efficiency. Studies by Monari (2020), Karinki et al. (2021), Agili et al. (2020), and Githu and Minja (2025) rely heavily on perceptual, survey-based performance indicators and primary data analyzed using descriptive and regression techniques. In contrast, relatively few studies such as Kariuki (2023) and Namagwa et al. (2024, 2025) apply efficiency-oriented methodologies like data envelopment analysis, and these are largely outside the university sector. This presents a clear methodological gap in examining how corporate governance affects universities' ability to optimally transform inputs into outputs.

The literature reveals conceptual, contextual, and methodological gaps that justify the current study. Conceptually, most studies conflate performance with efficiency, despite these being distinct constructs. Contextually, efficiency-focused governance studies have largely examined pension schemes, insurance firms, or constitutional bodies rather than universities in Kenya. Methodologically, there is limited use of secondary data and frontier efficiency techniques such as data envelopment analysis within higher education governance research. Consequently, a focused study on the effect of corporate governance on the efficiency of universities in Kenya using data envelopment analysis is necessary to address these gaps, reconcile inconsistencies in existing findings, and provide more objective and policy-relevant evidence. Based on this, this study sought to test the null hypothesis;

H_{01}: Corporate governance has no influence on efficiency of Kenyan universities.

3.0 Methodology

3.1 Philosophical Approach

This study utilized a positivist research philosophy. The philosophy emphasizes the use of quantitative data, empirical evidence and statistical analysis to test hypotheses. With positivist research philosophy, researchers remain independent from the study to ensure that the findings are objective and reliable (Park et al. 2020).

3.2 Research Design

This study adopted ex post facto research design. An ex post facto research design investigates the possible cause-and-effect relationships by examining existing conditions or events that have already occurred, without manipulating any variables. It relies on analyzing past data to determine how independent variables may have influenced dependent variables (Nash, 2023). The design allowed the researcher to collect existing data without interference and without manipulation.

3.3 Data Source and Relevant Approval

An introduction letter was obtained from University of Embu, and then a research permit was obtained from the National Commission for Science, Technology and Innovation. Secondary data sources were collected from university records. Secondary data for the study was collected from financial budgets, income and expenditure statements of the universities. Information was also taken from self-study and annual reports of the universities. The study covered 30 public and 18 private universities operating in Kenya which were chartered on or before 2016. The period is chosen in order to capture information about all universities which were operational when differentiated unit cost was introduced among Kenyan universities in 2017. The study period was from 2016 to 2021.

3.4 Sample selection and characteristics

The study adopted a census approach by selecting all the 48 universities operating in Kenya during the study period, comprising 30 public and 18 private universities, as the unit of analysis. This comprehensive sample selection was justified by the relatively small and manageable number of accredited universities and the need to avoid sampling bias while ensuring sector-wide representation. The inclusion of both public and private universities allowed for meaningful comparison across ownership types and institutional sizes, which was critical for examining the moderating role of university size. The sampled universities varied considerably in terms of student enrolment, staffing levels, financial capacity, governance structures, and academic focus, reflecting the structural heterogeneity of Kenya's higher education sector. The six-year balanced panel dataset (2016–2021) captured both cross-sectional and temporal variations in efficiency and institutional characteristics, enhancing the robustness of the analysis and allowing for more reliable estimation of efficiency scores and moderation effects.

3.5 Operationalization and Measurement of Variables

Corporate governance was measured using council size, gender diversity, frequency of meetings, number of sub-committees, ethnic diversity of top management, and council remuneration, as these indicators capture board structure, diversity, activity, and oversight costs, which are central to governance effectiveness and agency control mechanisms (Meckling & Jensen, 1976; Carter et al., 2003; Bertoletti & Johnes, 2021). Table 1 shows variables names, variable type, measurement and data sources.

Table1: Operationalization and Measurement of Variables

Variable Name	Variable Type	Measurement	Data Sources
University Efficiency	Dependent	DEA efficiency score ranging from 0 to 1 under Variable Returns to Scale (VRS). Computed using input–output model (inputs: operating expenditure, academic staff, non-academic staff; outputs: number of graduates, research publications).	University annual reports; audited financial statements; Commission for University Education (CUE) reports; institutional records
Council Size	Independent	Total number of council members serving in a given year	University council reports; annual governance disclosures
Gender Diversity	Independent	Proportion of female council members to total council membership (%)	University annual reports; governance reports
Frequency of Council Meetings	Independent	Number of formal council meetings held per financial year	University annual reports; council minutes summaries

Number of Sub-Committees	Independent	Total number of active council sub-committees (audit, finance, academic affairs)	Governance structure reports; university statutes
Ethnic Diversity of Top Management	Independent	Blau index: 1-$\sum P_i^2$, where p_i is the proportion of each ethnic group in top management	Institutional HR records; annual reports
Council Remuneration	Independent	Total annual compensation paid to council members (Kenyan Shillings, KES)	Audited financial statements; remuneration disclosures
Student Enrolment	Control	Total number of registered students per academic year	University statistics; CUE reports
Asset Base	Control	Total value of university assets (KES) as reported in financial statements	Audited financial reports
University Age	Control	Number of years since establishment	University profiles; CUE records
Ownership	Control	Dummy variable: 1 = Public university, 0 = Private university	CUE records
Entry Grade	Control	Mean entry grade of admitted students (KCSE equivalent)	University admissions records
Country's Economic Growth	Control	Annual GDP growth rate (%)	Kenya National Bureau of Statistics (KNBS); World Bank data
Student Enrolment	Control	Total number of registered students per academic year	University statistics; CUE reports

3.6 Analytical Models

Data analysis entailed data envelopment analysis (DEA) to determine efficiency of the universities. For the particular case of this study, it is specified that a given university i utilizes $x = (x_1 \ldots . x_N) \in R + N$inputs to produce $y = (y_1 \ldots . y_M) \in R + M$ outputs. Each university is a combination of input (x) and output (y) vectors. These sets form the technology (T) as $T = \{(x_s, y_s): x_s \geqslant 0; y_s \geqslant 0; xcanproducey\}$, which is the convex set containing all input-output combinations. In the specification of the technology, "s" stands for sequential, which prevents technical regression.

Evaluation of resource use efficiency obtained the output-oriented efficiency score from CCR (Charnes et al., 1978) model, and Banker, Charnes and Cooper model. The CCR model considers the overall technical and the BCC model considers pure technical efficiency (PTE) and scale efficiency (SE). Every university was treated as decision-making unit. The output-oriented DEA model is described in the following manner.

Constant return to scale

Max $TE^k{}_{CRS} = \varphi_k$

Subject to:

$\sum_{j=1}^{n} \lambda\, jxij \leq xi\kappa$

$\sum_{j=1}^{n} \lambda\, jyrj \geq \varphi\kappa yr\kappa$

$\lambda j \geq 0$

Variable return to scale

Max$TE^k{}_{VRS} = \mu_k$

$\sum_{j=1}^{n} \lambda\, jxij \leq xi\kappa$

$\sum_{j=1}^{n} \lambda\, jyrj \geq \varphi\kappa yr\kappa$

$\sum_{j=1}^{n} \lambda\, 1 = 1$

$\lambda j \geq 0$

(1)

To establish the influence of CG on efficiency, censored regression model was used.

$y_{it} = \beta_0 + \beta_1 cc_{it} + \beta_2 cs_{it} + \beta_3 fm_{it} + \beta_4 rc_{it} + \beta_5 se_{it} + \beta_6 ceg_{it} + \beta_7 s_{it} + \beta_8 a_{it} + \beta_9 qhsg_{it} + \beta_{10} o_{it} + \mu_i + v_{it}$

(2)

$$y_{it} = \begin{cases} a & \text{if } y_{it}^* \leq a \\ y_{it}^* & \text{if } a < y_{it}^* < b \\ b & \text{if } y_{it}^* \geq b \end{cases}$$

(3)

Where y_{it} is efficiency, cc_{it} is council characteristics, cs_{it} is council structure, fm_{it} is frequency of meetings, rc_{it} is remuneration of the council, se is student enrolment, ceg is country economic growth, s is size of the university, a is age when the university was chartered, qhsq is qualifying high school graduate, o is the ownership of the university μ_i is a time-invariant individual specific effect, and v_{it} is the remaining disturbance.

The study further computed Malmquist Index using Data Envelopment Analysis (DEA) results for multiple years. Efficiency scores for each university were compared between consecutive periods to calculate indices for technical efficiency change, technological change, and total factor productivity change. These individual results were then averaged across all universities to produce the Summary of Annual Means, which summarized the overall trends in productivity and efficiency across the study period.

4.0 Results and Discussions

4.1 Efficiency of Universities in Kenya

In measuring the efficiency of universities in Kenya, the key input used included funding per student, expenditure per student, staff expenses, administration expenses, government funding, total academic staff, number of students and student enrollments. The output parameters included number of publications, total number of graduates, total number of courses and total value of research grants over the period 2016-2021. Table 2 shows the efficiency of universities in Kenya.

Table 2: Efficiency of Universities in Kenya

Variable	Obs	Mean	Std. Dev.	Min	Max
Technical efficiency	288	0.571	0.241	0.34	0.90

The average efficiency of universities in Kenya is 0.571 (57.1%). The most efficient university had efficiency score of 90.0% while the least efficient university had efficiency score of 24.1%. Kenyan public universities face significant efficiency challenges, often resulting in negative growth in total factor productivity. Key issues include a weakened financial status due to increased enrollment and high debt, strained infrastructure, a high academic staff-to-student ratio, and mismanagement. While some private universities offer competitive alternatives, overall efficiency is hindered by limited funding, a lack of modern equipment, and the need for enhanced management practices and staff development. Table 3 categorizes efficiency across universities in Kenya.

Table 3: Categorization of Efficiency of Universities in Kenya

Efficiency of universities	Frequency	Percent
0%-39%	9	18.75
40-59%	23	47.92
60-89%	14	29.17
90% and above	2	4.16
Total	48	100

Results in Table 3 shows that 18.75% of universities in Kenya had efficiency score of 0-39%, 47.92% had efficiency score of 40-59%, and 29.17% had efficiency score of 60-89% while 4.16% of the university scored efficiency of 90% and above. The results imply that low efficiency in Kenyan universities. The results are in agreement with Ogechi and Gachanja (2024) who established failing efficiencies in Kenyan universities. This contrasts efficiency in university colleges where Titus et al. (2021) found efficiency of 87% in American universities while in South Africa the efficiency of universities was 78.2% according to Temoso et al. (2023).

4.2 Corporate Governance and Efficiency of Universities in Kenya

The study sought to establish the influence of corporate governance on efficiency of universities in Kenya. The indicators of corporate governance included council size, number of male members of the council, number of female members of the council, total number of sub-committees, total number of ethnic groups represented in the top management, frequency of meetings by the council and remuneration of council members while the outputs included number of publications, total number of graduates, total number of courses and total value of research grants. The descriptive results are presented in Table 4.

Table 4: Descriptive Results for Corporate Governance

Variable	Mean	Standard Deviation	Min.	Max.
Total Number of Council Members	8.906	0.419	5.000	9. 000
Total number of sub-committees	4.000	0.000	4. 000	4. 000
Total number of ethnic groups represented in the top management	4.910	1.025	3. 000	6. 000
Frequency of meetings by the council	5.000	0.891	4. 000	9. 000
Remuneration of council members (per siting allowances in KES)	8,908.09	4,489.07	1,505	18,413

From the descriptive results, the total number of council members had a mean of 8.906 and a standard deviation of 0.419. Its minimum and maximum values were 5 and 9 respectively. Total number of sub-committees had a

mean of 4 and a standard deviation of 0. Its minimum and maximum values were 4 and 4 respectively. Total number of ethnic groups had a mean of 4.910 and a standard deviation of 1.025. Its minimum and maximum values were 3 and 6 respectively. Frequency of meetings by the council had a mean of 5 and a standard deviation of 0.891. Its minimum and maximum values were 4 and 9 respectively. Remuneration of council members had a mean of 8908.09 and a standard deviation of 4489.07. Its minimum and maximum values were 1505 and 18413 respectively.

Further, the MALMQUIST Index Summary of Annual Means was used to measure and analyze changes in the efficiency and productivity of universities over time. This index helps identify whether improvements or declines in performance are due to technological progress or technical efficiency changes. It provides a dynamic perspective, showing not just how efficient universities are at a given time, but how their efficiency evolves across different years.

The MALMQUIST Index Summary of Annual Means was computed using Data Envelopment Analysis (DEA) results for multiple years. Efficiency scores for each university were compared between consecutive periods to calculate indices for technical efficiency change, technological change and total factor productivity change. These individual results were then averaged across all universities to produce the Summary of Annual Means, which summarized the overall trends in productivity and efficiency across the study period. The MALMQUIST Index Summary of Annual Means for Corporate Governance are presented in Table 5.

Table 5: MALMQUIST Index Summary of Annual Means for Corporate Governance

Year	Efficiency Change (Effch)	Technical Change (Techch)	Pure Efficiency Change (Pech)	Scale Efficiency Change (Sech)	Total Factor Productivity Change (Tfch)
Year 2	1.008	3.802	1.000	1.008	3.833
Year 3	0.982	0.213	1.000	0.982	0.209
Year 4	0.951	1.287	1.000	0.951	1.224
Year 5	1.068	0.600	1.000	1.068	0.642
Year 6	1.011	1.005	1.000	1.011	1.016
Mean	1.003	0.911	1.000	1.003	0.914

The constituent components of total factor productivity change included efficiency change (EFFCH), technological change (TECHCH), pure efficiency change (PECH), and scale efficiency change (SECH). The results reveal nuanced trends in productivity performance over time. On average, total factor productivity declined, with a mean TFPCH of 0.914, suggesting an overall productivity regression of 8.6% during the evaluation period. This decline was primarily attributed to a shortfall in technological change (TECHCH), which averaged 0.911, indicating that shifts in the production frontier were insufficient or negative in some years. However, efficiency change (EFFCH) had a slightly positive mean of 1.003, implying a marginal improvement in ability of universities to convert inputs into outputs relative to the best practice frontier.

The results further indicated that pure efficiency (PECH) remained constant at 1.000 across all periods, indicating that managerial performance was stable and not a contributing factor to the fluctuations in productivity. Scale efficiency (SECH) showed slight variability, with a mean of 1.003, implying minor gains in achieving optimal operational scale. In terms of year-specific results, there was volatility of technological change. In Year 2, TFPCH peaked at 3.833, driven by a significant leap in technological change (TECHCH = 3.802), despite no change in pure efficiency. In contrast, Year 3 recorded the lowest productivity, with a TFPCH of 0.209, again driven largely by a sharp contraction in technological change (TECHCH = 0.213). These fluctuations underscore the significant influence of technological progress on productivity outcomes. Thus, while firms maintained consistent internal efficiencies, technological change was the primary driver of both productivity gains and regressions.

The study further conducted a regression analysis to determine the effect of corporate governance on the efficiency of universities in Kenya. The multiple linear regression results are presented in Table 6.

Table 6: Regression Results for Corporate Governance and Efficiency

Efficiency	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
Total number of ethnic groups	7.076	10.673	0.660	0.508	-13.935	28.087
Council Structure	-58.222**	21.917	-2.660	0.019	-199.790	83.350
Frequency of board meetings	2.212**	0.984	2.240	0.037	-10.372	12.796
Council Remuneration	0.003	0.003	0.990	0.325	-0.003	0.008
Student enrolments	0.036**	0.017	2.060	0.040	0.002	0.070
Country economic growth	0.577	2.412	0.240	0.811	-4.171	5.325

Asset base	0.036***	0.011	3.150	0.002	0.013	0.058
Qualifying high school grade	0.854	0.782	1.090	0.275	-0.685	2.394
Age of university	2.762**	1.213	2.280	0.024	0.374	5.150
Ownership of University	-264.851***	51.899	-5.100	0.000	-367.020	-162.690
_cons	1603.751***	161.075	9.960	0.000	1286.700	1920.840
Number of obs	288					
Wald Chi2(10)	146.13					
Prob > Chi2	0.000					

Sig * sign at 10%, ** sig at 5% and *** sig at 1%

From the results, the coefficient of total number of ethnic groups was positive (7.076) and statistically insignificant (0.508>0.05). This implies that total number of ethnic groups is an insignificant determinant of the efficiency of universities in Kenya. The coefficient of council structure was negative (-58.222) and statistically significant (0.419>0.05). This implies that council structure is a significant determinant of the efficiency of universities in Kenya. The coefficient of frequency of board meetings was positive (2.212) and statistically significant (0.037<0.05). This implies that frequency of board meetings is a significant determinant of the efficiency of universities in Kenya. The coefficient of remuneration was positive (0.003) and statistically insignificant (0.325>0.05). This implies that remuneration is an insignificant determinant of the efficiency of universities in Kenya.

The coefficient of student enrolments was positive (0.036) and statistically significant (0.04<0.05). This implies that student enrolments is a significant determinant of the efficiency of universities in Kenya. The coefficient of country economic growth was positive (0.5766504) and statistically insignificant (0.811>0.05). This implies that country economic growth is an insignificant determinant of the efficiency of universities in Kenya. The coefficient of qualifying high school grade was positive (0.854) and statistically insignificant (0.275>0.05). This implies that qualifying high school grade is an insignificant determinant of the efficiency of universities in Kenya. The coefficient of age of university was positive (2.761983) and statistically significant (0.024<0.05). This implies that age of university is a significant determinant of the efficiency of universities in Kenya. The coefficient of ownership of university was negative (-264.851) and statistically significant (0.000<0.05). This implies that ownership of university is a significant determinant of the efficiency of universities in Kenya.

The composition of the governance structure can be used to enhance efficiency among internet companies in China (Shabbir et al., 2020). Board diversity improves technical efficiency and total factor productivity among non-financial firms in China (Ali et al., 2021). This implies that a diverse council might enhance technical efficiency of a university. Similarly, corporate governance factors influence the cost efficiency in Malaysian Takaful industry (Lee et al., 2019). This is an indication that corporate governance might also contribute to cost efficiency within university. Nonetheless, Scafarto et al (2020) established that board size and director independence had positive effect on intellectual capital efficiency of family firms and negative effect on intellectual capital efficiency of non-family firms. Thus, it is likely that corporate governance effect on efficiency of universities might differ between private and public universities. In Kenya, corporate governance significantly influences university performance (Agili, 2020). A study by Kamath (2019) showed that board size had negative significant effect on efficiency while independence of directors had a positive significant impact on efficiency. This implies that the effect of various characteristics of corporate governance may have different effect on efficiency of universities.

Governance in Kenyan universities face many challenges including large student numbers, overstretched facilities, insufficient government support, inadequate induction of new staff, resistance to change and cultures that support impunity on the part of some non-performing employees (Mulili, 2014). This implies that irrespective of the composition corporate governance, challenges facing universities might impact negatively on the efficiency of these institutions. Spanish university stakeholders attach great importance to the disclosure of specific information on aspects of corporate governance, which would result in improved transparency and accountability (Ramirez & Tejada, 2018).

Ina addition, Githu and Minja (2025) indicated that there was a strong relationship between risk management practices, board responsibility, transparency and accountability practices and the performance of organizations under study. Thus, corporate governance practices have a significant impact on the performance of independent constitutional commissions in Nairobi City County, Kenya. Gathitu et al. (2025) further pointed out that ethical values did not moderate significantly the relationship between competitive strategies and performance of accredited universities in Kenya. Monari (2020) also indicated that universities in Kenya have put in place various accountability, transparency and ethics mechanisms meant to institutionalize corporate

governance to propel effective performance of the institutions. Further, the practice of corporate governance among Kenyan universities is still generally weak and therefore require strengthening. Finally, corporate governance is positively and significantly related to organizational performance and that corporate governance significantly affects performance of universities in Kenya.

Nduati Kariuki (2023) further indicated that Kenyan insurers are technically inefficient. Board independence, gender diversity and audit quality significantly positively impact the technical efficiency of Kenyan insurers. Board size negatively affects technical efficiency of Kenyan insurers. However, there was an insignificant relationship between CEO duality, intensity of board activities and technical efficiency. Mwaniki and Njoroge (2022) established that internal factors, external factors, types of risks and risk knowledge have statistically significant effect on organizational internal efficiency. Further, risk assessment practices such as risk ranking and prioritized risk significantly affect organizational internal efficiency. Moreover, risk control techniques and contingency plans made significant contribution on organizational internal efficiency. Finally, proper documentation, risk management policy and internal audit had statistically significant effect on organizational internal efficiency. Namagwa et al. (2025) revealed that corporate governance, through trustees who sit on boards as pension schemes' member representatives, significantly and positively influence the efficiency of pension schemes. Furthermore, trustees who sit on boards as independent members reflect a negative effect on efficiency. Vundi (2024) also indicated that there was a positive and statistically significant influence of Board of Director independence, accountability, composition and fairness on performance of KEBS. There was a positive and statistically significant influence of Board of Director independence, accountability, composition and fairness on performance of KEBS.

4.3 Robustness Check

The robustness check of the model depicting the effect of Corporate Governance on efficiency of universities was conducted using Random Effect Model. The model results are shown in Table 7.

Table 7: Robustness check model

University Efficiency	Coef.	Robust Std. Err.	z	P>z	[95% Conf.	Interval]
Total number of ethnic groups	7.076	8.787	0.810	0.421	-10.145	24.298
Council Structure	-58.222***	21.916	-2.657	0.002	-213.194	96.750
Frequency of board meetings	1.212***	.182	6.678	0.000	-10.904	13.328
Council Remuneration	0.003	0.003	1.020	0.308	-0.003	0.008
Student enrolments	0.036***	0.009	3.890	0.000	0.018	0.054
Country economic growth	0.577	0.735	0.780	0.433	-0.864	2.018
Asset base	0.036***	0.008	4.290	0.000	0.019	0.052
Qualifying high school grade	0.854**	0.414	2.060	0.039	0.043	1.666
Age of university	2.762***	0.508	5.430	0.000	1.766	3.759
Ownership of University	-264.851***	24.146	-10.970	0.000	-312.176	-217.527
_cons	1603.751	99.335	16.140	0.000	1409.057	1798.444
R-sq:						
within =	0.643					
between =	0.315					
overall =	0.641					
Wald chi2(5) = 107.56						
Prob > chi2 =.000						

Sig * sign at 10%, ** sig at 5% and *** sig at 1%

The robustness of the model assessing the effect of corporate governance on the efficiency of universities was evaluated using a Random Effects Model, which allows for controlling unobserved heterogeneity across universities while accounting for both within- and between-variation. The overall model shows a strong fit, with an overall R-squared of 0.641, indicating that approximately 64% of the variation in university efficiency is explained by the included variables. The within-university R-squared of 0.643 suggests that changes within individual universities over time are well captured by the model, while the between-university R-squared of 0.315 indicates moderate explanatory power for differences across universities. The Wald chi-square test of 107.560, with a p-value of 0.000, confirms that the model is statistically significant overall, implying that the joint effect of all explanatory variables on university efficiency is not due to random chance.

Examining the specific coefficients, the results reinforce the earlier findings from the main model. Council

structure exhibits a significant negative effect on efficiency (Coef. = -58.22, $p < 0.01$), highlighting that certain structural arrangements may impede timely decision-making and effective governance. Conversely, the frequency of board meetings has a strong positive effect on efficiency (Coef. = 1.21, $p < 0.01$), suggesting that frequent oversight enhances institutional performance. Other significant determinants include student enrolments (Coef. = 0.036, $p < 0.01$), asset base (Coef. = 0.036, $p < 0.01$), age of the university (Coef. = 2.762, $p < 0.01$), and ownership (Coef. = -264.85, $p < 0.01$), indicating that operational scale, institutional maturity, and public versus private status continue to play critical roles in shaping efficiency outcomes.

Several variables were not statistically significant, including the total number of ethnic groups, council remuneration, and country economic growth, as their high p-values indicate a lack of meaningful influence on university efficiency. Qualifying high school grade shows marginal significance (Coef. = 0.854, $p < 0.05$), reflecting a modest effect of student academic quality on output efficiency. The Random Effects Model confirms the robustness of the main study findings, demonstrating that governance structure, meeting frequency, institutional characteristics, and ownership consistently explain variations in efficiency. These results provide confidence in the validity of the study conclusions and underscore the importance of sound corporate governance for optimizing resource utilization and performance in Kenyan universities.

5.0 Conclusion, Recommendations and Implications

The results lead to the conclusion that universities in Kenya are generally operating below optimal efficiency levels, as reflected by an average technical efficiency score of 57.1%. A majority of the universities fall below the 60% efficiency threshold, indicating substantial inefficiencies in the transformation of financial, human, and institutional inputs into academic and research outputs. These inefficiencies are largely attributed to financial constraints, rising enrolments, high staff-related costs, infrastructural strain, and managerial weaknesses, particularly in public universities. The findings corroborate earlier evidence by Ogechi and Gachanja (2024) on declining efficiencies in Kenyan universities, while sharply contrasting with higher efficiency levels reported in developed and emerging contexts such as the United States and South Africa.

It was further concluded that corporate governance plays a significant but selective role in determining the efficiency of universities in Kenya. Specifically, council structure, frequency of board meetings, student enrolments, asset base, age of the university, and ownership significantly influence efficiency, while ethnic diversity of councils, council remuneration, country economic growth, and qualifying high school grades are not significant determinants. The negative effect of council structure and university ownership suggests that certain governance arrangements and ownership models may constrain efficient decision-making and resource utilization, particularly in contexts characterized by bureaucratic complexity. Conversely, the positive effects of frequent board meetings, institutional maturity, asset endowment, and growing enrolments indicate that active oversight, accumulated organizational experience, and adequate resources enhance efficiency. These findings align with prior empirical evidence showing that governance mechanisms affect efficiency in a context-specific manner and may yield differing outcomes across public and private institutions.

Effective governance structures including attributes such as accountability, transparency, strategic leadership and stakeholder inclusivity, enable institutions to align resources, make sound financial decisions and implement policies that promote academic excellence and institutional sustainability. Strong governance ensures that management practices adhere to clear standards, enhancing operational efficiency and reducing instances of mismanagement and resource wastage. As public and private universities face increased pressure to demonstrate performance, governance mechanisms such as board structure, board size, frequency of board meetings and board remuneration become central to driving institutional effectiveness.

Further, policy interventions should address the negative impact of certain ownership and governance arrangements on efficiency. For public universities, this could involve clarifying governance roles, reducing bureaucratic bottlenecks, and promoting greater autonomy in decision-making while maintaining accountability. For private universities, careful structuring of ownership models and board composition is important to avoid conflicts that may slow down operations. Furthermore, universities should align enrolment strategies with available resources to prevent overstretching of facilities and staff, ensuring that growth in student numbers translates into improved institutional productivity rather than inefficiency. These measures can help universities in Kenya optimize their resources, improve academic outputs, and enhance overall institutional efficiency.

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