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Revenue Diversification on Financial Sustainability of Public Universities in Kenya

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Abstract

Public universities play a critical role through academic empowerment of the citizens and actively participating in knowledge dissemination and research in society. However, despite being the centers of knowledge creation and development, one of the significant challenges facing public universities in Kenya is financial sustainability. This is evidenced by growing debt from financial institutions, unremitted statutory deductions, and shrinking government grants. Whereas proponents of sound financial management practices including revenue diversification hold the practices as possible solutions for financial sustainability of every organization, few studies have been done to ascertain this position in Kenyan public universities. Therefore, this paper sought to assess the effect of revenue diversification on financial sustainability of Kenyan public universities. The study used modern portfolio theory and financial sustainability model to discuss the variables. A descriptive research design was adopted while targeting 41 public universities for the study. Random sampling approach was applied to select 22 out of the 41 public universities. Using a secondary data collection template, secondary panel data was collected from the office of auditor general for the financial years 2018/2019 to 2022 / 2021.The study found revenue diversification had a negative significant impact on financial sustainability using gearing ratio and a positive significant effect on financial sustainability using sustainability ratio in Kenyan public universities. The study recommends that public universities should explore innovative alternative sources of revenue and close revenue-generating units whose marginal costs are higher than marginal revenues.

Keywords: *Revenue Diversification, Financial Sustainability, Public Universities, Gearing Ratio, Sustainability ratio*

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1.0 Introduction

One of the significant challenges facing universities globally is financial sustainability, as evidenced by growing debt from financial institutions and shrinking state funding Jaafar, Latiff, Daud, and Osman (2023). The situation has further been aggravated by the global economic crisis and increased competition. In a study by EY-Parthenon Education Practice (2021), higher education debt burden in the United States increased at a 4 % rate from 2011 to 2019, with the driver being reduced state funding. The debt growth rate exceeded annual enrolment growth rate of 1%. In Malaysia, after a decline in government funding, public universities opted for external borrowing as an alternative source of financing Jaafar et al. (2023). Regionally, financial sustainability continues to be a major challenge facing public universities due to high

population growth rate, economic hardship, and higher enrolments in the African continent. In Kenya, Samoei and Makau (2022) confirm continued weakening of financial stability among public universities amid increased enrolment from 546,699 to 562,066 in academic years 2020/2021 to 2021/2022 respectively. According to Universities Funding Board (UFB) April 2021 status report, universities in Kenya owed various statutory bodies including SACCOs and insurance bodies unremitted statutory deductions and accumulated penalties of Ksh 57 billion (UFB, 2021).

This instability limits the autonomy of the universities by obstructing planning and flexibility to run various organization affairs (USAID,2017). Revenue diversification refers to an organization's multiple sources of income. Organizations with more diversified revenue streams are more financially stable, are less prone to instability, and are less likely to have insolvency risks Jaafar et al. (2023). According to Ochenge (2022) utilizing alternate sources of revenue serves as an essential economic shock absorber during periods of declining profits like the one experienced during the COVID-19 pandemic. Ahmad et al. (2019) stressed universities need to diversify their incomes to reduce dependence on state funding, manage risks, and promote financial sustainability. According to Githaiga (2021), instead of being overly dependent on donations and government subsidies, microfinance institutions have used revenue diversification to achieve financial sustainability. Wekullo and Musoba (2020) affirm that revenue diversification empowers universities to transition from the old revenue-generating ways that have had low incomes both in the US and UK to other modern ways which have a high growth potential.

To measure revenue diversification the study used a diversification index called Herfindahl-Hirschman Index (HHI). Several researchers have used the HHI in the field of higher education to assess revenue diversification including Europe and US. The HHI diversification index (DI) factors the total revenue sources, revenue amounts across revenue sources thus indicating the degree of diversification whether strongly, weakly or moderately as demonstrated in Table 1.

Table 1: Classification of Revenue Diversification using HHI Value

HHI Value		**Degree of Diversification**
Unstandardized estimation	Standardized estimation	
From 0 to 1500	From 0 to 0.15	Strong revenue diversification
From 1500 to 2,500	From 0.15 to 0.25	Moderate revenue diversification
From 2,500 to 10,000	From 0.25 to 1.00	Weak revenue diversification

Source: Chikoto, Ling and Neely(2016); Garland(2020)

1.1 Problem Statement

Audited reports on Kenyan public universities have revealed existence of financial distress, in form of technical insolvency, with many unable to meet immediate financial obligations coupled with increasing debts and shrinking government grants. Such revelations paint an unpromising picture of higher education in Kenya despite its crucial role in society through academic empowerment of the citizens, development of future leaders and actively participating in knowledge dissemination and research (Odhiambo, 2018).

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According to Auditors general report, universities gearing ratios have been increasing in the past few years. For instance, gearing ratios of University of Nairobi and Kenyatta University which are the oldest universities in Kenya have been increasing and are above the recommended ratio of 1% as shown in Figure 1. These trends are likely to lead to financial risks, and persistent prolonged financial instability of public universities if a workable solution is not urgently realized (Jaafar et al., 2023).

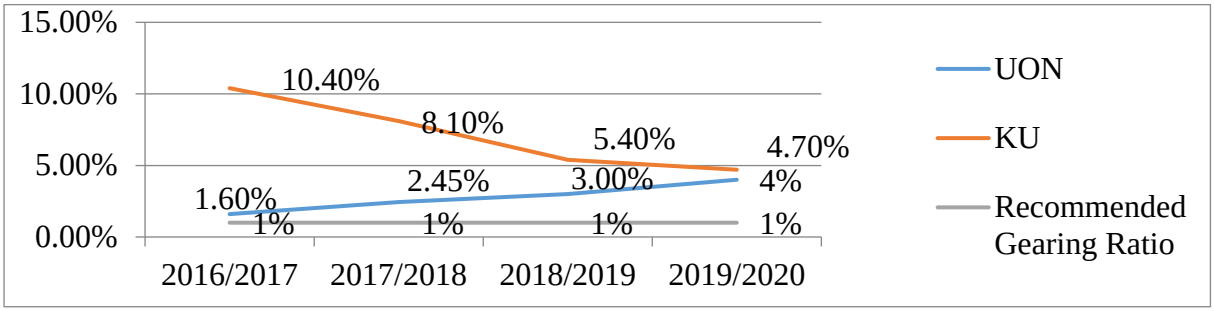

Figure 1: Gearing Ratios of UON and KU from 2016 to 2020

Source: Auditor General, (2020).

Riachi (2021) conducted a study on the determinants of the financial sustainability of private universities, a case of Strathmore University. The findings that revenue diversification had an insignificant effect on revenue sustainability of universities contradicts other studies conducted and it is for this reason this study is carried out to confirm if revenue diversification has an insignificant effect on financial sustainability. Secondly, the study focused on one private university business model. This study sought to fill the contextual gap by focusing on all public universities.

1.2 Research Objective

The primary objective of this study was to evaluate the effect of revenue diversification on financial sustainability of public universities in Kenya.

2.0 Literature Review

2.1 Theoretical Review

The study was theoretically informed by Modern Portfolio theory, which was developed by Harry Markowitz in 1952. The theory explains how an investor can maximize an asset's return as well as minimize the asset's risk through risk diversification by carefully balancing quantities of diverse assets. The theory further identifies systematic and unsystematic risks which every investor should be aware of. The theory assumes that risk and return are the only two parameters that affect an investor's decision, which is not true Markowitz (1952). Contextually, the theory suggests revenue diversification as a potential strategy for universities to minimize the risk associated with overreliance on government funding. According to modern portfolio theory, public universities can come up with various ways to generate extra income and improve their financial sustainability. For instance, an agricultural institution like JKUAT and Egerton can leverage their agricultural technology to create valuable products for the national and international markets. Others that are well endowed with massive land for instance Kenyatta University can use the idle land to generate extra income. They can use the hectares of land to farm vegetables, or any other farm produce that can fetch more revenue to the university. As such, they may be able to generate substantial income to settle some of their bills and consequently increase their revenue.

2.2 Empirical Review

Jaafar et al. (2023) researched revenue diversification's impact on financial sustainability of public universities in Malaysia. Revenue diversification, financial leverage, and firm size were the control variables. Hirschman Herfindahl Index measured revenue diversification while financial sustainability was assessed using Return on Assets (ROA) and Net Profit Margin (NPM). The results of the study revealed that revenue diversification had a significant positive relationship on financial sustainability. The current study adopted use of HHI to measure revenue diversification in the Kenyan context, a country with different macroeconomic and business environment.

Ochenge (2022) conducted a study on revenue diversification of non-interest income on Kenyan commercial banks during the COVID-19 pandemic. According to the study's findings, banks with diverse revenue streams were more profitable and financially secure. The study suggested banks to use new technology to create non-traditional products with minimal marginal costs and urged regulators to be open to innovations that will improve institution's financial sustainability. The study was conducted on financial sector, while this study was on education sector.

Riachi (2021)studied determinants of financial sustainability using Strathmore University. Human resource competence, revenue diversification, and cost management practices were used to achieve specific objectives. The study used primary plus secondary data and measured revenue diversification using a Likert scale. The study concluded that human resource competence and cost management practices significantly impacted financial sustainability while revenue diversification had minimal impact. The finding contradicts other studies that have confirmed revenue diversification significantly affects sustainability. The current study measured revenue diversification using a diversification index called Herfindahl-Hirschman Index (HHI).

Areri, Kamau and Kipchumba (2019) using descriptive and cross-sectional survey research designs investigated the impact of innovations on revenue sources of Kenyan public universities. The study discovered technology innovation and diversification had a positive relationship and recommended university administrations to implement strategic innovations that will enhance alternative revenue streams to ensure long-term sustainability.

Maina (2018) analysed commercial bank's revenue diversification effects on their financial performance. Asset quality, liquidity, capital adequacy, and management efficiency were the control variables and revenue diversification was measured using HHI. The study found a negative significant effect on financial performance. It was conducted in financial sector but the current study focused on education sector.

2.3 Conceptual Framework

Figure 2 below illustrates conceptual link among the study variables. Financial management practice which is the independent variable has revenue diversification while financial sustainability is the dependent variable.

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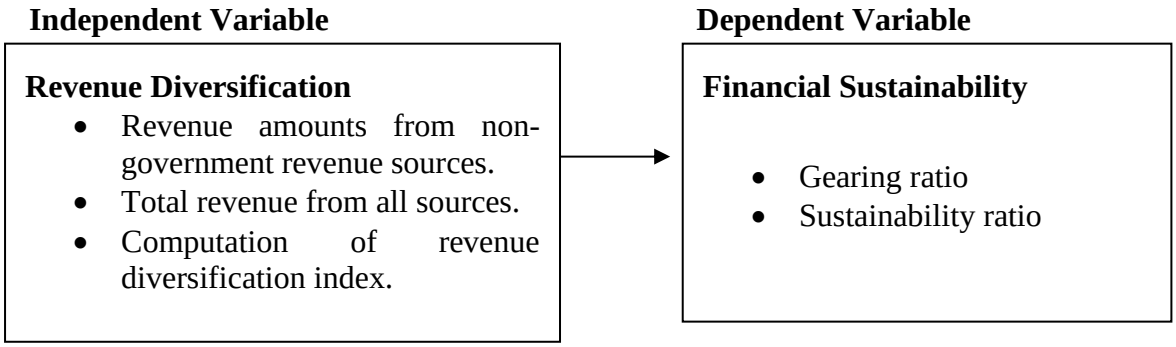

Source: Author, (2024)

3.0 Methodology

Descriptive research design was adopted while targeting 41 public universities for the study. The researcher used a random sampling approach to select 22 public universities using Stat Trek random number generator from the internet (https://stattrek.com/statistics/random-number-generator),1 out of 41 target population. The sample size of twenty-two (22) universities out of the 41 public universities was reached based on recommendations by Mugenda and Mugenda (2003) and Gay et al.(2012). They recommended a 30% sample size of the accessible population for correlation research and 10% for a descriptive study. Therefore, 50% was deemed appropriate.

Quantitative secondary data was then retrieved from audited financial statements of the universities through the office of auditor general. The panel data entailed a time series for a 5-year period, from 2018 to 2022 while the cross-section data had 22 public universities (Appendix I). Use of panel data enhanced credibility since panel data provides more efficacy, more degrees of freedom, more explanatory data, and less collinearity among variables Hsiao (2014). The study used a statement of comprehensive income, a statement of financial position, a statement of comparison of budget and actual amounts, and relevant disclosures from the universities' annual audited financial report.

4.0 Results and Discussion

4.1 Descriptive Analysis

The financial management and sustainability variables had descriptive results demonstrated in Table 1 below.

Table 1: Results for Descriptive Statistics

Variable	Obs	Mean	Std. dev.	Min	Max
Gr	110	.2810663	.2602286	.0052866	.9124369
SR	110	-.0509135	.4747347	-.9503078	1
REVDIV	110	.2707156	.1802372	.0051042	.7954239

Source: Survey Data (2024)

The gearing ratio (GR) and sustainability ratio (SR) were used to measure financial sustainability. From the findings, the average gearing ratio (GR), which measures the extent to which university resources have been financed by debt, measured by DER for the twenty-two

universities, for the period between 2018 and 2022 was 0.28106. The ratio was within the recommended ratio of < 0.45 meaning the universities are within the recommended thresholds. The findings agree with Riachi (2021) that debt to equity ratio of universities, a case of Strathmore University that averaged 0.49 was within the recommended ratio.

In addition, the sustainability ratio (SR), which indicates the ability of the university to cover its annual expenses from accumulated revenue reserves without the need for additional funding, was -0.0509. A ratio of 1.0 indicates the university can cover a year's expenses without the need for additional funding, while a ratio below 1.0 implies the available revenue reserves of the universities would not cover the following year's expenses without soliciting additional funding. The sustainability ratio of -0.0509 indicates Kenyan public universities would not cover the following year's expenses without the need for additional funding. A study by McLaren and Struwig (2019) showed a South African University with sustainability ratios above 1.0 but declining over the study.

The revenue diversification average value measured by HHI was 0.2707, indicating weak revenue diversification among the universities. An index of 0 to 0.15 HHI shows a strong revenue diversification, 0.15 to 0.25,a moderate revenue diversification while 0.25 to 1.00 indicates weak revenue diversification Chikoto, Ling and Neely (2016); Garland (2020).

4.2 Model Diagnostic Tests

To ensure valid and consistent results were recorded normality tests, stationary tests, and heteroscedasticity tests were performed.

4.2.1 Normality Test

Shapiro wilk test was used to test normality.

Table 2: Normality Test Outcome using Shapiro Wilk

Variable	Obs	W	V	z	Prob>z
Gr	110	0.82925	15.269	6.078	0.00000
SR	110	0.94621	4.811	3.503	0.00023
REVDIV	110	0.89211	9.648	5.055	0.00000

Source: Survey Data (2024)

Table 2 shows the p-values of revenue diversification and gearing ratio was0. 0000, 0.0000, and 0.0023 respectively indicating they were not normally distributed. P value > 0.05 means data is normally distributed data while if it is < 0.05 it means there is no normality and null hypothesis is rejected. The normality of the data was resolved using log transformation.

4.2.2 Stationary Test

Due to the data containing cross-sectional and time series data, a stationary test was conducted. The stationary of data is conducted to prevent occurrence of spurious regression and ensure valid model results. The study used Harris-Tzavalis to conduct the unit root test as shown in Table 3. P- value > 0.05 means the panels are stationary hence null is rejected and alternative hypothesis is accepted while if P- value is <0.05 it means the panels are not stationary hence null hypothesis is not rejected.

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Table 3: Harris-Tzavalis Unit-Root Stationary Test Outcome

Variable	Period	Panels	Statistic	Z	P-Value
Revenue Diversification	5	22	-0.1778	-6.5239	0.0000

Source: Survey Data (2024)

The results indicated revenue diversification had p-value of 0.0000 which is < 0.05 meaning it is stationary.

4.2.3 Heteroscedasticity Test

Heteroscedasticity refers to divergence of the error term in a regression model while homoskedastic means constant variance of the error term. It was tested using breusch –pagan cook-weisberg test using gearing and sustainability ratios as shown in tables 4 and 5 below. A p--value> 0.05 means the data is homoskedastic or not heteroskedastic, thus accepting null hypothesis while a p-value < 0.05 means data suffers heteroskedasticity and null hypothesis should be rejected.

Table 4: Heteroscedasticity Test Outcome using Breusch- Pagan (Gearing Ratio)

```
Breusch-Pagan/Cook-Weisberg test for heteroskedasticity
Assumption: Normal error terms
Variable: Fitted values of GR

H0: Constant variance

    chi2(1) =   5.36
Prob > chi2 = 0.0206
```

Source: Survey Data (2024)

The p- value (0.0000) which is < 0.05 indicates existence of heteroscedasticity in the data and therefore suggests null hypothesis should be rejected. To address the heteroscedasticity the researcher transformed the data.

Table 5: Heteroscedasticity Test Outcome using Breusch- Pagan (Sustainability Ratio)

```
Breusch-Pagan/Cook-Weisberg test for heteroskedasticity
Assumption: Normal error terms
Variable: Fitted values of SR

H0: Constant variance

    chi2(1) =   3.71
Prob > chi2 = 0.0540

.
```

Source: Survey Data (2024)

The p-value of 0.0540 is > 0.05 implying a null hypothesis should not be rejected.

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4.3 Regression Analysis

The effect of revenue diversification on the financial sustainability of the sampled universities was approximated using regression analysis. Two regression models were used.

4.3.1 Gearing Ratio

The research assessed how revenue diversification, as a financial management practice, impacts financial sustainability of public universities in terms of gearing ratio. The model was:

$Y1_{pt} = \beta p + \beta 1\ X1_{pt} + \varepsilon$ Where$Y1_{pt}$ is gearing ratio; $X1_{pt}$ is revenue diversification; βp-constant; p is public university; t is period/time, and ε I refers to error term of the public university.

β1 is the regression coefficient for the revenue diversification variable. Table 6 displays the findings of key statistics in the regression analysis of f statistics, r- r-squared, regression coefficients, and t statistics.

Table 6: Regression Analysis Outcome using (Gearing Ratio)

```
Fixed-effects (within) regression               Number of obs      =       110
Group variable: ID                              Number of groups   =        22

R-squared:                                      Obs per group:
     Within  = 0.3190                                         min =         5
     Between = 0.1728                                         avg =       5.0
     Overall = 0.1750                                         max =         5

                                                F(5,83)            =      7.78
corr(u_i, Xb) = 0.1553                          Prob > F           =    0.0000
```

GR	Coefficient	Std. err.	t	p>|t|	[95% conf. interval]	
REVDIV	-.1428783	.0581438	-2.46	0.016	-.2585239	-.0272326
_cons	.5743992	.0709726	8.09	0.000	.4332376	.7155608
sigma_u	.23893138					
sigma_e	.05379884					
rho	.95174736	(fraction of variance due to u_i)				

F test that all u_i = 0: (F(21, 83) = 59.31 Prob> F = 0.0000

Source: Survey Data (2024)

R-squared indicates the quantity of independent variable that explains the dependent variable. The model r- r-squared of 0.1750, indicates that revenue diversification can explain 17.50 % of the financial sustainability using gearing ratio. The F statistics which is represented by ANOVA, examines whether the chosen regression model is suitable. The f statistic p-value was 0.0000 indicating regression model is most appropriate in forecasting the effects of financial management practices on financial sustainability. The findings further indicate holding other factors constant, gearing ratio of the universities will be 0.5744.

The first specific objective of the researcher was to determine the effect of revenue diversification on financial sustainability. The results indicated regression coefficient was -

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0.1429 and p value was 0.016 on revenue diversification, implying an inverse significant effect on financial sustainability using gearing ratio. It also means a unit increase in revenue diversification across the selected public universities and time would result in 0.1428 decrease in gearing ratio. Implying with stronger revenue diversification the gearing ratios of public universities will decrease while with weak revenue diversification, the gearing ratios will increase.

4.3.2 Sustainability Ratio

The study further evaluated how financial management influences financial sustainability in public universities measured in terms of sustainability ratio. The regression model is shown below. $\mathbf{Y2_{pt} = \beta p + \beta 1\ X1_{pt} + \varepsilon}$ Where$Y2_{pt}$ is sustainability ratio; $X1_{pt}$, is revenue diversification; βp- constant; p refers to the public university; t is time; ε is error term of the university and β1is the regression coefficient;

Table 7: Regression Analysis Outcome using Sustainability Ratio

```
Random-effects GLS regression                   Number of obs      =       110
Group variable: ID                              Number of groups   =        22

R-squared:                                      Obs per group:
     Within  = 0.5288                                         min =         5
     Between = 0.3997                                         avg =       5.0
     Overall = 0.4060                                         max =         5

                                                Wald chi2(5)       =    107.45
corr(u_i, X) = 0 (assumed)                      Prob > chi2        =    0.0000
```

SR	Coefficient	Std. err.	t	p>|t|	[95% conf. interval]	
REVDIV	.4159041	.1019775	4.08	0.000	.216032	.6157763
_cons	-.203918	.1489509	-1.37	0.171	-.4958564	.0880205
sigma_u	.39716708					
sigma_e	.09750179					
rho	.94315876	(fraction of variance due to u_i)				

Source: Survey Data (2024)

Table 7 above shows r- squared of 0.4060, indicating that revenue diversification can explain 40.60% of the financial sustainability (sustainability ratio). The F statistics was 0.0000 indicating regression model is a good fit for forecasting the effects of financial management practices on financial sustainability (sustainability ratio). Holding other factors constant the sustainability ratio of the selected public universities would be -0.2039.

The results show revenue diversification had a regression coefficient of 0.4159 and a p-value of 0.000 implying a positive significant effect on financial sustainability ratio. This means a strong revenue diversification should lead to a higher sustainability ratio while weak revenue diversification will lead to a lower sustainability ratio. The finding concurs with Jaafar et al. (2023) that financial sustainability had a significant impact on revenue diversification.

5.0 Conclusion

Revenue diversification has a significant negative effect using gearing ratio and a significant positive effect on financial sustainability using sustainability ratio in Kenyan public universities. Implying with stronger revenue diversification the gearing ratios of public universities will decrease while with weak revenue diversification, the gearing ratios will increase. Also strong revenue diversification should lead to a higher sustainability ratio while weak revenue diversification will lead to a lower sustainability ratio.

6.0 Recommendations

Revenue diversification had a positive significant effect using sustainability ratio and a negative significant effect using gearing ratio. The researcher recommends that public universities explore alternative revenue sources. These may include utilizing idle resources like land for agriculture and dairy farming, offering digital and online courses to the public, employing technology in agricultural institutions to add value to products for local and international markets, providing transport services to students and staff both within and outside the universities, fundraising through alumni associations and endowments, engaging in financial management activities and investments, forming corporate alliances for business initiatives, and monetizing assets. These efforts aim to reduce gearing ratios and improve financial sustainability. The universities should also leverage technology to come up with innovative income-generating avenues and this will improve their revenues. The revenue-generating units whose marginal costs are higher than marginal revenue should be closed to avoid more losses.

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