FINANCING OPTIONS AND FINANCIAL SUSTAINABILITY OF UNIVRESITIES IN KENYA

(A COMPARATIVE STUDY OF PUBLIC AND PRIVATE)

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF DOCTOR OF PHILOSOPHY IN BUSINESS ADMINISTRATION OF THE UNIVERSITY OF EMBU

AUGUST, 2022

DECLARATION

This thesis is my original work and has not been presented elsewhere for a degree or any other award.

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In loving memory of my father Patrick Riungu who built a strong foundation for my life and in appreciation of my mother Joyce Riungu who always prayed and encouraged me.

ACKNOWLEDGEMENT

I wish to acknowledge the almighty God for enabling me this far with this doctoral thesis.

My sincere gratitude to my supervisors Dr. Duncan Mugambi Njeru and Dr. Kennedy Nyabuto Ocharo for their time, continuous support and guidance in writing this thesis. I am also grateful to the entire management of the University of Embu for the assistance accorded to me during the period of study. Further, I appreciate all the lecturers who took us through this course and presentations for their rigorous training, constant guidance and dedication. In particular, chairman of Business Studies Department, Dr. Samuel Kariuki for your concern on my progress throughout.

Appreciation is extended to my husband and children. Thank you for your unwavering love, encouragement and support throughout my doctoral studies. To my sisters and brothers, I express my appreciation for your love and prayers. I sincerely appreciate the effort Dr. Elias Njeru Njagi in mentoring me throughout the entire process and the useful insights that he willingly gave.

Appreciation also goes to Dr. Kirema Mburugu Nkanata for the support and guidance he offered to me throughout my doctoral studies. I am grateful to all my friends for their encouragement and prayers. I am indebted to my colleagues for the support accorded to me by taking up some of my office responsibilities from time to time during my study. Finally, I would like to thank my doctoral colleagues for their motivation and moral support.

God bless you all.

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ABBREVIATIONS

CR	Current Ratio
CUE	Commission for University Education
DUC	Differentiated Unit Cost
FLR	Financial Liability Ratio
GDP	Gross Domestic Product
HEIs	Higher Education Institutions
KENAO	Kenya National Audit Office
PHLIs	Private Higher Learning Institutions
R & D	Research and Development
RDT	Resource Dependency Theory
RoK	Republic of Kenya
UDSM	University of Dar es Salaam
UK	United Kingdom
USA	United States of America

DEFINITION OF TERMS

Debt Financing	Borrowing of funds from lenders in order to support an institution's operations and repay it back within a specified period of time with interest (Kimathi, 2019).
Differentiated Unit Cost	The annual cost per student of providing a particular degree program. This entails the facility costs, staff costs and other institutional overhead costs (Estermann & Pruvot, 2014).
Financial Sustainability	This refers to the ability of a university to meet its financial obligations, referring to the ability to meet its spending commitments both now and in the future and the ability to cover costs through various sources of revenue (Ngenoh, 2020).
Funds Utilization	Allocation of received funds in a sustainable manner (Imana, 2017).
Institutional Characteristics	Internal features which have the capacity to positively or negatively influence financial sustainability (Waithaka, 2018).
Revenue Streams	Various sources of income that institutions use to finance operations such as internally generated revenue, government funds, student fees, endowment and trust funds (Estermann, 2020).

ABSTRACT

Universities provide higher education that boosts formation of human capital through inculcation of knowledge, skills and promotion of talents which contribute significantly to the economic development of a country. Despite this significant contribution, Kenyan universities have continued to face financial challenges due to inadequate funds and increasing operational costs leading to financial unsustainability. This has stifled operations in the Kenyan universities. The study sought to establish the influence of financing options on the financial sustainability of universities in Kenya. Specifically, the influence of revenue streams, debt financing and the joint influence of financing options. The moderating influence of institutional characteristics and mediating influence of funds utilization was also examined. Five research hypothesis relating to objectives were tested. The study used positivist research philosophy and employed longitudinal survey design. The study collected secondary data from annual financial statements and reports from 55 universities, comprising of 31 public universities and 24 private universities, covering the period 2015 to 2020. The study used descriptive and inferential statistics to analyze the data. Prob (F-statistics) were used to test hypotheses in the study. The results revealed that $p = 0.000<0.05$ for both public and private universities. H_{01} was concluded that revenue streams had a statistical significant influence on financial sustainability for both public and private universities. With $p = 0.037<0.05$, $p = 0.028<0.05$ for public and for private $p = 0.015<0.05$, $p = 0.044<0.05$ on financial sustainability as measured by current ratio and financial liability ratio respectively, H_{02} was concluded that debt financing had a statistical significant influence on financial sustainability for both public and private universities. With $p = 0.013<0.05$, $p =0.358>0.05$ for public and for private $p = 0.027<0.05$, $0.543>0.05$ on current ratio and financial liability ratio respectively, H_{03} was concluded that financing option had a statistical significant influence on financial sustainability as measured by current ratio while insignificant on financial liability ratio for both public and private universities. With $p = 0.036<0.05$, $p = 0.017<0.05$ for public and for private $p = 0.040<0.05$, $p = 0.020<0.05$ on financial sustainability, H_{04} was concluded that the strength of the relationship between financing options and financial sustainability depends on institutional characteristics. The recurrent expenditure had p-values<0.05 on financial sustainability. With p-values<0.05 for capital expenditure on financial sustainability as measured by financial liability ratio while on current ratio the p-values>0.05 for both public and private universities respectively. H_{05} was concluded that the strength of the relationship between financing options and financial sustainability partially depends on funds utilization. The study highlight that the university management needs to formulate diversified strategies to create and attract more revenue streams to meet university's operational costs. In addition, the university management need to employ optimal debt levels when necessary. Universities need to expand academic and research programmes and also put strict measures on how funds are spent. The study findings contribute to the policy makers, existing empirical literature and researchers.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Universities range in size and complexity, though they all have the same general goal of delivering educational services. To assist them accomplish their goals, they practically adopt the same academic and managerial structures (Lucianelli & Citro, 2017). Globally, the cost of financing university education is increasing, thus the financial sustainability of their missions will undoubtedly be the drift for colleges in the twenty-first century (Akeel, Bell & Mitchell, 2019). Universities have different ways of financing their costs such as direct public funding, tuitions fees, commercial or entrepreneurial services and philanthropic funding. These streams of income aim at enhancing financial sustainability which is a key component of efficiency and effectiveness. In most countries, both the developed and developing, governments play a significant part in financing higher education.

Globally, many countries have experienced an increased enrolment in student numbers. For instance, in the United Kingdom (UK) over the last 20 years the numbers of students have doubled. This doubling has however contrasted with the funds per student in that the funding provided is not proportional to the number of students (UK report, 2017). In Australia, main stream funding has been declining thus being forced to seek for alternative funding sources (Kikutadze & Tabatadze, 2016). The various alternative funding sources that have been adopted by universities globally include: offering research and consultancy services, entrepreneurial services and involvement in external partnerships. For example, in USA, University of California, in its first four decades largely depended on income from state and federal grants. The decline in funding affected activities in the university as the funds were insufficient (Aubrey, 2018). Direct public support is the primary source of income for universities in Europe, contributing approximately three quarters of an institution's budget while a quarter comes from other sources for sustaining their operations (Marginson, 2017).

In 2017, the Malaysian government reduced the funding of public universities to 70 percent, leaving 30 percentage of the budget to be covered through self-generated income resulting to unfulfilled financial obligations (Ahmad & Farley, 2014).

In regional perspective, the problem of financing in universities is more severe in Africa than in the rest of the world. These universities are financed through government funding, donors support and cost sharing approach. However, funds allocated to universities have been insufficient in relation to the total number of students enrolled in these universities (World Bank, 2017). The underfunding has persisted for some years leading to a number of challenges such as shortage of lecturers, learning resources, research and development (R&D) and generally poor working conditions which threaten their survival in the long run (Ishengoma, 2017).

In Iraq, long term financial sustainability of higher educational institutions (HEIs) is achieved when the overall revenue is distributed as self-generated income at approximately 53%, government subsidies at 35% and private donations at 12% of the expected expenditure (Akeel, Ameer & Heider, 2019). In University of Dar es Salaam in Tanzania (UDSM), government's approval rate declined in comparison to the Council-approved University budgets from 93.2% in 2015/16 to 63% in 2016/17 (Ishengoma, 2017). Zambia has challenges in financial sustainability of universities in regards to funding sources in that the funds allocated by the state have been insufficient. This has forced university council to adopt financial models that enhances sustainability. However, the Government is also working on having a mandatory policy that ensures that alumni contribute back to their former universities (Mashininga, 2018). This is aimed at enhancing universities financial sustainability through other revenues.

In Ethiopia, financial sustainability has continued to be the greatest contest for universities, as their key prerequisite is to be financially agile in order to achieve their intended objectives, implement policies, fulfil their mission and serve their stakeholders for a period of time (Tamrat, 2018). There has been an expanded enrollment in most of the universities in the country and this has compromised quality of education due to strained finances. The quantitative increase in the enrollment of students has not seen a proportionate quantitative increase in funding sources (Tamrat, 2018).

Rwanda also faces challenges in regard to financial sustainability, as the government reduced university funding. In 2016, the Government of Rwanda cut the operational budget of University of Rwanda by 50%, leaving the universities to fund the balance (Rwirahira, 2017). The financing available to universities in terms of government funds has been declining across African countries. This has rendered most of the universities unable to deliver teaching, innovation and extension services. Financial challenges have become a norm to African universities which has compelled most of them to operate under tight financial framework so as to remain sustainable.

Kenyan universities are also reeling under financial problems. The country has been in the forefront in fostering the education level by increasing the number of universities, since the student enrolment has grown exponentially from 10,000 students in 1990 to 566,042 in 2020 (Republic of Kenya, 2020). From the year 2016, 86% of students in universities were enrolled in public universities while 14% were enrolled in private universities. The previous funding structure for government-sponsored students in universities was allocating funds uniformly per student irrespective of the programme of study. From the year 2018, the state started funding government sponsored students at differentiated unit cost (Republic of Kenya, 2019). However, funds in respective to funding per student were never enough and there has been late disbursement to the universities. The public university sector debt stands at KES 5.4 billion (Republic of Kenya, 2020). This has affected the quality of services in many public universities including deterioration of facilities, staff redundancy, accumulated debts, reduced research activities and training. Private universities are not an exception as they are also experiencing financial challenges prompting them not able to fully meet their obligations (Ngenoh, 2020).

Currently, the financial crisis experienced in Kenyan universities is a consequence of the budget cuts, dwindling students' enrolment and increased costs caused by the tough economic conditions. For instance, from year 2017, all students who scored C+ and above were placed in both public and private universities. This has translated to hundred percent placement of all students who score C+ and above leaving the universities with less or no students to enroll as self-sponsored. Munene (2019) noted that the number of universities increased but the student enrolment dwindled.

This has led to both private and public universities receiving less income from self-sponsored or module II students which account for part of the total revenue base thus threatening their survival. This has resulted to public universities accumulating debts, delaying payments to suppliers and service providers, among others. On the other hand, private universities are experiencing serious financial difficulties leading to a state of dilemma on how to fulfill their obligations. Therefore, Kenyan universities are facing financial challenges of responding to the country's academic needs and struggling to remain financially sustainable (Wanzala, 2017). Based on the forgoing, the purpose of this study was to investigate the influence of financing options on the financial sustainability of universities in Kenya.

1.1.1 Financing Options

Financing options refers to providing various financial resources, usually in form of money to a person, a business or any other private or public institutions. This is income which can be relied upon as regular and flexible in the operations. In respect to universities, financing is a significant function that plays a crucial role in assisting achieve their goal. The government is seen to play a significant part in the funding of the university education system to facilitate their operations. Public universities mostly rely on government funding and less of other funds for their operations. Thus public universities typically do not engage in open competition and do not set their service prices to reflect their costs (Minyoso, 2020). On the other hand, private universities receive some funds from the government but price their services at a profit. However, they are still controlled by ministry of education through Commission for University Education (CUE).

The daily operations and developments in universities is a function of funds at their disposal. Both public and private universities operate with funds from restricted and unrestricted sources for their financial survival. Marginson (2017) confirms that there are two types of financing in institutions of higher learning which includes restricted funds (funds from government and donors) and unrestricted funds (funds generated within the institution). In Kenya, universities fund their operations with finances from government, student fees, donations, internally generated income and borrowings. In this study, financing options are viewed as revenue streams and debt financing options.

Universities rely on various revenue streams to finance their operations. Institutions of higher learning ought to have various revenue sources to support their activities so as to remain financially stable (Ahmed, 2015). These revenue streams include student fees, government grant, endowment trust funds and other internally generated revenue. Student fees are revenue received from charges for offering academic programs. Endowment trust funds are donations from the public and private sectors. To fill the financial gap, most universities carry out entrepreneurial activities which generate funds, such as renting out properties, offering funeral homes services, farming, catering and hospitality, among others (Chumba, Muturi & Oluoch, 2019).

Debt financing has been used as an instrument of financing in both private and public sector (Onchonga, Muturi, & Atambo, 2016). Debt finance is important source of capital in numerous ways in expanding firms since their withheld profits may not be adequate or perhaps not available (Githaigo & Kabiru, 2015). Debt financing is among the key financing options that are taken by firms since it has an effect on the financial performance (Harelimana, 2017). According to Harelimana, (2017), debt financing takes many forms which include, trade credit, bank loans and installment purchase. Most universities utilize bank loans and trade credit to support their operations. Universities require these funds to finance their daily costs of operation for instance academic programs and cover staff costs, among others (Kajirwa, 2015).

Generally, public universities had avoided debt financing and relied on government funds, income from fees, charitable donations and endowment and investment portfolio income to support their operations. Recently, there has been a divergence of events as well as trends which had contributed to an increased and a more aggressive borrowing activity by the universities. These borrowed funds are utilized for major new facilities, renovations or even for running activities in universities. However, in a healthy organization the ratio of borrowed funds partly defines the degree of financial sustainability (Winckler, 2013). Therefore, this study considered three debt financing options; long-term debt, short-term debt and trade credit in universities.

1.1.2 Institutional Characteristics

Institutional characteristics are internal features which have the capacity to positively or negatively influence performance of an organization (Kinoti, 2012). Institutions function in a setting where there are existing elements that can affect the correlation between elements. In order to accomplish the goals of an institution, these variables must be managed and are within their control. Every organization has distinctive internal and external characteristics and these elements are crucial to the organization's overall performance. In the university context, the commonly accepted features include; age, size, nature of institution, ownership, systems, academic programmes, style of leadership and processes (Kimathi, 2019). Thus, organizations survive and succeed through interaction between these features and the overall operating systems.

This study considered the size of the university and academic programmes. The size of university is defined by its assets position and human capital resource. The size of the institution can influence the financial sustainability in the manner that the number of students determine the amount of income earned. Organization size is an important predictor for performance measured in financial terms (Waithaka, 2018). On the other hand, the number of academic programs determine the amount earned which may influence the performance of an institution. Higher learning institutions which have various academic programs such as technology, research and development and the related innovative activities are likely to attract more funds (Alhassah, 2018). In regard to the universities, it is important to understand the relative effect these institutional factors have on the relationship with the overall outcome.

1.1.3 Funds Utilization

Funds utilization refers to how financial resources can be used efficiently for value creation and sustainability. Generally, funds utilization is the involvement in management of financial resources for effective and efficient usage in order to meet the objectives (Ng'ang'a & Kibati, 2016). The goal of a sustainable university is dependent on the extent to which the financial resources are managed. The management of these resources largely vary according to the nature of the institution.

The managers of the public universities are required to account for all the funds received irrespective of the source. For accountability, the funds are utilized by expending to various accounts known as vote heads. Every financial year the accounting officers are required to present the expenditure in the financial statement supported by necessary explanations. Similarly, private universities have different sources of revenue but their usage is not tagged to any rules and procedures. However, private universities may be required to account for funds received from the donors depending on the funding conditions and the origin.

The patterns in firm's utilization of financial resources may reveal differences in their ability to achieve sustainability in the future (Wachira, 2018). In the context of the university, funds utilization is composed of recurrent and capital expenditure for accounting purposes. Recurrent expenditure is payment made for one year, while capital expenditure is payments for tangible assets used in the production process exceeding one year (Oyekan, Adelodun & Oresajo, 2019). Funds received by universities from various sources are prudently allocated to both recurrent and the capital expenditure in order to fulfill their goals to enhance financial sustainability. Financial crisis experinced in most universities is as a result of poor financial resource management. Therefore, universities have been forced to cost cut in order to scale down their operations in a bid to enhance financial sustainability (Lim, 2016). This study analyzed how financial resources are utilized by being allocated to recurrent and capital expenditure in public universities and private universities.

1.1.4 Financial Sustainability

Financial sustainability refers to the financial potentiality of an organization to support current and future obligations (Lucianelli & Citro, 2017). For an organization to achieve financial efficiency and effectiveness, it needs to create long-term objectives that specify its needs to be financially stable in the future (Mutinda & Ngahu, 2016). University sustainability is maintaining the ability to be financially stable over the long run, since they help communities with a high need for dependable and services of teaching, research and extension.

In light of this, the objective of financial sustainability for universities is to increase services to citizens as they build resistance to occasional economic crisis. The issue of financial crisis in universities is made worse by the world economic crisis (Deloitte, 2015). Ngenoh (2020) noted that an institution that is long-term sustainable but short-term unsustainable will have a persistent cash shortage. In order to accomplish the long-term objectives of an institution, it is crucial to understand differences in factors related to financial sustainability. These factors are income diversification, debt financing, own income generation and utilization of finances (Ng'ang'a, 2017). Funds utilization is important as it helps to project the expenditure of an organization and how to cover those expenditures which determines organizational financial sustainability. Income diversification is another aspect that is important when analyzing financial sustainability. Organizations need to have alternative sources of income instead of relying on one source which can compromise sustainability. University sustainability can be achieved through commitment to revenue diversification and effective management of financial resources (Jung, Park & Ahn, 2019). These aspects are important as they help to ensure that there is continuity in an organization.

Universities have been experiencing scarce resources due to limited funding opportunities and overreliance on one funding system. In addition, the operational costs in the universities has been growing unproportionately to government funding (Wolff, 2021). An organization that is not able to meet its current and long term obligations is regarded as financially unsustainable (Wachira, 2018). Therefore, financial health of an organization is measured through an analysis of various indicators which include; debt-equity ratio, current ratio, debt ratio, working capital ratio, acid test ratio (Kelchevskaya, 2014). Other measures of financial sustainability include leverage, growth rate, liquidity, financial liability ratio and net operating ratio (Afriye, 2015; Cernostana, 2017; Nalwoga, 2021; Sami & Sree, 2017; Sazonov et al. 2015; Wachira, 2018; Webb, 2015). This study considered the current ratio and financial liability ratio to assess the financial sustainability of universities in Kenya. These two ratios are preferred because they are applicable in both non-profit and profit making organizations.

Current ratio is appropriate metric for determining the liquidity position in universities since it gauges the short-term financial strength, shows the efficiency in meeting current obligations as there are due and gives understanding of working capital to the management. Financial liability ratio is appropriate for explaining the solvency of a university. Therefore, financial liability ratio is preferred because it shows the capacity of the university to pay off their debt from available revenue.

1.2 Statement of Problem

Financial sustainability has been a persistent challenge to all universities. The issue has been how to remain financially sustainable and still cater for ever-rising academic needs. The operatonal costs have been rising but the funds have not been proportional to the costs. Over the years the cost of offering university education has been rising and the funding gap widening (Wachira, 2018). The Kenyan government has been funding students at a fixed rate of KES 70,000 per year per student regardless of the programme of study (Kenya National Bureau of Statistics, 2019). The fixed rate of funding stood for a period of time upto the year 2017 and from the year 2018, the government adapted funding system known as differentiated unit cost (DUC) to fund students both in private and public universities. For instance, on average the cost per student for one academic year ranges from KES 600,000 for the dentistry programme to KES 144,000 for arts (Republic of Kenya, 2019). The government is expected to contribute 80% to fund the placed students but the allocation has been 60% per year. The implementation of DUC has not made much improvement since the monthly disbursement to these universities is made in defict. In addition, public universities have continued to receive reduced financial allocations from the government than their estimated budget for recurrent and capital expenditure. For instance, during the 2022/2023 financial year budget, the Treasury set aside KES 91.2 billion for public universities instead of the KES 102.807 billion (Republic of Kenya, 2022). This has left the universities to finance the shortfall, thus not able to sustain their operations.

The current state of affairs in both public and private universities reveals that all students who score C+ and above join universities as government sponsored students. This leaves the universities with few or no students to join as self-sponsored to bring in more income compared to government sponsored students leading to financial crisis. The Auditor General's report (2016) noted that most public universities have a Z-score of below 1.81, thus experiencing serious financial distress that they are not able to meet the staff operating costs, payment of suppliers and other overhead expenses. Altman (2013) asserts that a Z-score greater than 2.99 indicate firm's good performance, if less than 1.81 the firm is said to be in distress and headng to insolvency. A study by Omondi and Muturi (2013) indicated that most of the capital projects in public universities have been abandoned and physical facilities are in a state of disrepair. This scenario has raised more concerns over the survival of Kenyan universities in the long run.

Moreover, since 2020, the COVID-19 pandemic has aggravated the financial problems of all universities. The Kenyan government ordered the closure of all learning institutions to prevent the infection's spread, which forced many universities to begin offering e-learning courses. This meant that most universities had to acquire expensive remote instructional devices, which in turn increased their operational costs. The major client of these universities are students whose parents and guardians were unable to pay the required fees owing to the tough economic conditions caused by the COVID-19 pandemic; consequently, many universities experienced revenue losses. Thus, Kenyan universities' tendency to rely on traditional sources of revenue has resulted in many of them being unable to pay their employees and afford other overhead expenses.

Financial sustainability of higher education institutions (HEIs) has attracted the interest of many researchers. Several studies have been carried out on determinants and challenges of financial sustainability (Ng'ang'a & Kibati, 2016; Mutinda & Ngahu, 2016; Sazonov, et. al., 2015; Estermann & Pruvot, 2014; Cernostana, 2017). Some other studies assessed the effects of income generating activities and diversification on financial sustainability (Miranda, Chamorro & Rubio, 2016; Husin & Rashid, 2017; Estermann, 2020; Ngenoh, 2020). Other researchers have investigated the effects of debt financing and financial sustainability (Kimathi, 2019; Metto & Ombaba, 2021; Ng'ang'a, 2017).

Some of these studies considered the determinants and challenges only but the element of timing difference is of importance in this study. Other studies concentrated on revenue diversification, effects of income generating activities and debt financing on financial sustainability but have not considered other financial factors such as the moderator and the mediator. Further, most of the studies conducted have not paid much attention to the effects of financing options as a combination of revenue streams and debt financing on financial sustainability. In addition, these studies have used cross sectional, exploratory and case study approaches while this study used longitudinal survey design. Accordingly, this study attempts to fill these gaps by investigating the influence of financing options moderated by institutional characteristics and mediated by funds utilization on financial sustainability of universities in Kenya.

1.3 Objectives of the study

This study was guided by both the main and specific objectives.

1.3.1 Main objective

The main objective of this was to establish the influence of financing options on the financial sustainability of universities in Kenya.

1.3.2 Specific objectives

The specific objectives of the study were:

1. To determine the influence of revenue streams on financial sustainability of universities in Kenya.
2. To assess the influence of debt financing on financial sustainability of universities in Kenya.
3. To examine the joint influence of financing options on financial sustainability of universities in Kenya.
4. To evaluate the moderating influence of institutional characteristics on the relationship between financing options and financial sustainability of universities in Kenya.
5. To assess the mediating influence of funds utilization on the relationship between financing options and financial sustainability of universities in Kenya.

1.4 Research Hypotheses

This study was guided by the following research hypotheses:

H_{01}: Revenue streams have no influence on the financial sustainability of universities in Kenya.

$H_{02:}$ Debt financing has no influence on financial sustainability of universities in Kenya.

$H_{03:}$ Financing options have no joint influence on financial sustainability of universities in Kenya.

H_{04}: Institutional characteristics have no moderating influence on the relationship between financing options and financial sustainability of universities in Kenya.

H_{05}: Funds utilization has no mediating influence on the relationship between financing options and financial sustainability of universities in Kenya.

1.5 Scope of the Study

This study focused on the relationship between financing options, institutional characteristics, funds utilization and financial sustainability of 55 (31 public and 24 private) universities in Kenya registered by CUE as at December 2020. The financing options comprises of revenue streams (government grant, student fees, other revenue and endowment trust funds) and debt financing indicators were long-term debt, short-term debt and trade credit. Institutional characteristics indicators were size of university and academic programmes. Funds utilization on the other hand comprised of recurrent expenditure and capital expenditure. The financial sustainability measures adopted were current ratio and financial lability ratio. The study applied resource dependency theory, pecking order theory, revenue theory of costs and production theory. Finally, secondary data were obtained from the audited financial statements and reports of the universities for a period of six years (2015-2020).

1.6 Justification of the Study

The key aspect in all universities is to maintain sustainable operations in the long run. This study investigated how financing options influenced financial sustainability of universities in Kenya.

The findings would inform the effective revenue generation strategies that need to be put in place in universities in order to support revenue from government and student fees so as to ensure their survival in the long run. The findings of this study is useful to university managers by revealing the existing weaknesses on various revenue streams and how to improve on them so as to support their operations.

The findings also inform university management on the best debt financing options to be considered by providing insight on the consequences of debt financing on the running of their universities. Further the study findings highlight the importance of proper utilization of funds by the universities. This study also adds knowledge to the existing literature on financing options of universities and future researchers.

1.7 Limitations of the Study

The researcher encountered numerous limitation in relation to the research and especially in data collection. However, these limitations did not in any manner have a significant intervention in the outcome of this study. For example, data collection in private universities was cumbersome since availing of financial information is critical in that it is considered very confidential for access to third parties.

This was solved by assuring that the information given would not be divulged and only meant for academic purposes only. The Office of the Auditor General website had not captured the financial reports of public universities for all the years which subjected the researcher to visit the individual universities for information thus prolonging the period of collecting data. In spite of the impediments experienced the quality of the study was not compromised.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter reviews literature relevant to the area of study. Section 2.2 presents theoretical literature, section 2.3 covers empirical literature, section 2.4 presents the conceptual framework, section 2.5 presents the summary of the literature and section2.6 presents the research gap.

2.2 Theoretical Review

The study was guided by the following theories; revenue dependency theory, pecking order theory, revenue theory of costs and production theory.

2.2.1 Resource Dependency Theory

The resource dependency theory was proposed by Weber (1947), promulgated by Pfeffer and Salancik (1978) and improved by Pfeffer (2005). The theory states that resources are vital to the success of institutions that rely upon financial resources for sustainability. The theory further states that an institution can have several resources which when fully exploited can lead to better institution performance. Consequently, denying the basic financial resources creates vulnerability and undermines the performance. An institution faces challenges and risks when resources become limited, forcing it to seek funds from alternative sources (Odhiambo, 2018). To address this risk, institutions should be guaranteed continuous funds from different sources so as to support their daily operations.

In the university context, the resource dependency theory argues that utilizing multiple sources of revenue places a university in a better position as it is less reliant on a single source of revenue. Furthermore, once financing is concentrated in a limited source, a revenue decline can lead to a major budget deficit. By contrast, when revenue is obtained from different streams that lack a strong positive association, a decline in financing from one of the sources may be offset by an increase from another source. In this case, institutions that have multiple sources of revenue whereby actual amount is close to the projected amount have reduced chances of absolute risk (Mamo, 2015).

The financial health of higher learning institutions depends largely on their ability to diversify revenue streams (Johnstone, 2019). This study therefore analyzed the influence of various revenue streams on the financial sustainability of universities in Kenya.

2.2.2 Pecking Order Theory

This theory was proposed by Myers and Majluf (1984), where the theorists posit that financing follows hierarchy. The main implication of the theory is the strict arrangement of financing. Accordingly, firms have a predetermined sequence for obtaining funds used to finance their operations. Therefore, the empirical fact of the firms is to adopt a distinct preference for using internal finances rather than external finances. Firms may obtain external funding if internal resources are insufficient to finance investments, but they must select the various external finance sources carefully in order to avoid the additional costs associated with asymmetric knowledge. Myers and Majluf (1984) predict that managers will incline using up internally generated funds first, then using up share financing and finally resorting to risky debt financing. This implies that firms will choose the cheaper external financing option for their operations so as to avert unnecessarily additional costs. However, a firm's financial results determine the type of financing source obtained.

Myers and Majluf (1984) affirm that a firm with adequate earnings may support cash flow by investing retained profits, reducing the requirement for external funding. The theory assumes that outside parties will make an effort to gauge the firm 's financial success, which they are unable to fully monitor from the funding choices the firm makes. Therefore, this is a reliable element since firms that perform well can obtain more funding because investors see them as less most likely to fail. The theory is applicable to this study since universities can apply it to determine the most appropriate source of external financing for their operations as an addition to internal financing.

2.2.3 Revenue Theory of Costs

The revenue theory of cost was proposed by Bowen (1980), who noted that the unit cost of HEIs is determined by the revenue available for allocation but not by rigid technological requirements for delivering educational services. The theory assumes that costs of operating HEIs is determined more heavily by the quantity of money that institutions can raise.

Each institution raises all the funds it can and uses every penny of those funds. Bowen assert that the cost of higher education is determined by the needs of institutions. As a result, if revenues grow, costs will as well, but only because revenues have increased. Bowen indicated that the control of costs is diffused since the institutions endeavor to maximize revenues from various sources. Therefore, individual institutions should then employ their own internal mechanisms to allocate their activities to protect their autonomy.

Bowen's approach does not adequately capture the financial behavior of either private or public HEIs. Particularly, it is untrue that all institutions maximize their revenue generation. Additionally, it is untrue that every institution uses all of the funds it receives. For example, private institutions without a sizable endowment kitty work hard to raise such funds by shifting the unexpended portion of their current operating budget to a reserve account. Moreover, public institutions are given the option to carry over funds into the following year, which lowers expenses and establishes the reserves fund account (Chebet, 2014). However, Bowen theory stresses that HEIs need to allocate a large amount of money to projects such as buildings, infrastructure and less to staff costs and overhead expenses. Institutions differ in the minimum and maximum amounts they spend and that financing should be dependent on the individual educational expenditure (Nwosu & Okafor, 2018). This theory supported the funds utilization variable by informing the study on how well universities should allocate the available resources to the unit costs.

2.2.4 Production Theory

The production theory was proposed by Wicksell (1916) who asserted that the production result or output of a given enterprise can be regarded as a function of invested amount of inputs which include land, labor and capital. The theory was later tested by Cobb and Douglas (1928) through a model known as the production function as indicated in equation 2.1. The function enables the determination of the maximum amount of output that can be produced from any specified combination of inputs, given the existing technology. The study adopted this theory in the theoretical review to derive the model to be used in determining the relationship between the variables investigated by the study.

$$P(L, K) = bL^{\alpha}K^{\beta} \quad \ldots\ldots\ldots\

Where, P is total production, L is labour input, K is capital input, b is total factor productivity, α and β are the output elasticities of labour and capital respectively.

2.3 Empirical Review

This section discusses past studies according to the objectives of the study.

2.3.1 Revenue Streams and Financial Sustainability

Government grants are funds allocated by the government to public universities to provide higher education opportunities to its citizens. The funds are allocated to various universities to cater for both recurrent expenditure and capital expenditure. However, there is no clear criteria on how the funds are allocated to universities in Kenya. Gudo (2019) argued that the strategy employed by the government of Kenya to allocate funds to public universities is not clear and inadequate as it does not alleviate the financial struggles of the universities. The resource dependency theory argues that when financing is concentrated in a limited source, a revenue decline can lead to a major budget deficit. Munene (2019) added that the funds allocated to public universities in Kenya is inadequate, thereby subjecting the institutions to financial difficulties which negatively affect their operations. In addition, private universities also receive funds from the government for students placed in their universities, but treated as fees.

Mutiso, Onyango and Nyagol (2015) conducted a study on the consequences of funding sources on enrollment at Kenya's public universities and access to quality higher education. The effects of financing sources on enrolment at Kenya's public universities and access to high-quality higher education were examined using a case study. The study found that government capitation improved the level of education in Kenyan public universities by 57.3%. The study ignored other financial factors institutional characteristics as a moderator and funds utilization as a mediator. Panigrahi (2018) assessed the relationship between funding and outcomes of higher learning institutions (HLIs) in India. Questionnaires were used. The study documented a positive correlation between state funds and the outcomes of higher learning institutions (HLIs) in India. The author concluded that in addition to state funds, a mix of various funding methods such as a public exchequer, student fees, graduate tax and private sector funding, positively impacted the financial performance of HLIs.

A study by Ahmed, Siraj and Ismail (2019) on revenue diversification in Malaysian public higher learning institutions. Methodologically, the authors used Hirschman-Herfindah Index (HHI) as a metric for financial sustainability, while this study used ratios. The study found that a majority of the public higher learning institutions (PHLIs) in Malaysia were dependent on government funds. Mamo (2015) who did a study on techniques for generating income in Sub-Saharan Africa (SSA) universities established that government funds positively influenced the performance of universities in SSA countries. The study used interviews and case studies to collect data, but the sample covered only three universities. Ahmed (2015) used public subsidies and tuition income to investigate the financing of private and public HLIs in Nigeria. The study applied interviews and secondary data. The study found that public PHLIs only receive small allocations from the government, which needed to be supplemented by other revenue sources. Speck (2019) suggested that most universities and colleges have experienced decreased state funding subjecting them to face a financial crisis. Given this evidence, the study adopted the resource dependency theory perspective, which proposes that institutions relying on multiple sources of revenue are more successful than those depending on a single source.

Estermann (2020) examined the effect of the diversification of income streams on European universities' financial sustainability. The study used questionnaires, case studies and seminars to collect data. The study found that student fees significantly influenced the financial status of most European universities. Lee, Kim and Lee (2020) studied on factors that affect students' satisfaction in South Korean higher education institutions. The study applied the agency theory and assessed the constraints imposed by tuition fees on the financial management of private universities in Korea. The study found that a rise in tuition fees result to a decline in government subsidies and vice versa.

Webb (2015) conducted a study on a sustainable way to examine how revenue diversification aids educational institutions in surviving difficult economic times. A fixed effects regression analysis, resource dependency theory and modern portfolio theory were used to analysis the study. The study found that diversifying revenue, increased the total income per student and improved the financial outcomes in United States universities.

This study used random effects and resource dependency theory on both public and private universities in Kenya. Mutiso et al., (2015) carried a study on the implications of funding sources on enrollment in Kenya's public universities and access to quality higher education. Case study, interviews questionnaires, document analysis and simple regression model were used. The study revealed that tuition fees had a significant influence on the performance and educational standards in HLIs in Kenya.

Oketch (2016) established that student fees can be an immense earning source that helps universities meet their obligations. Omona (2017) reported that universities that depend significantly on fees from students are at risk of experiencing financial challenges. Rwebiita (2020) added that the unit cost of offering quality education was higher than the fees received from students, thereby leaving universities to finance the balance. In contrast Ahmad, Ismail and Siraj (2019) studied on officials' perceptions of the financial sustainability of Malaysian public universities. Primary data was collected by administering questionnaires to the senior officers. The study revealed that rising tuition fees was not a viable method of enhancing sustainability in the universities. The study recommended that officers need to critically utilize resources and engage in other revenue generating activities to enhance income.

Other revenue refers to the internally generated revenue derived from commercial activities. Wachter (2012) noted that universities are responsible to raise the income from entrepreneurial activities to cover the gap created by the public funding from government along with tuition and fees. Resource dependent theory stresses that multiple sources of revenue place an institution in a better position as it is less reliant on a single source of revenue. Afriye (2015) examined the factors which can have an impact on the long-term viability of Ghanian higher education learning institutions. The study used a predictive effects model while this study employed random effects model on only universities in Kenya. The study found a positive relationship between internally generated funds and growth of HEIs. Ahmed, Soon and Ting (2015) assessed the activities involved in the income generation of universities in Malaysia.

The study used a qualitative approach through purposeful random sampling, while primary data was analyzed using an interactive model. This study considered a census and used a random effect model for the analysis. The authors noted that income generated through commercial services for instance shops, farming and rentals are critical to the manageability of universities.

Miranda, Chamorro and Rubio (2016) conducted a study on income generating projects in University of Eastern Philippines. The study used a descriptive-correlation research design in order to further understand the extent to which third-stream activities had been implemented. The study revealed that improvement of income generating activities enhances total income. The study concluded that income generating activities were a tool of enhancing financial sustainability. A study conducted by Hussin and Rashid (2017) on diversifying income generation in public universities in Malaysia used qualitative approach and content analysis. The study found that income generated from other sources positively contributed to the running of the universities. The study acknowledged the role of income generating activities in enhancing financial sustainability of universities in Malaysia. Mamo (2015) did a study on revenue generation strategies in Sub Saharan African universities. The study used interviews and case studies to collect data, but the sample covered only three universities. The study revealed that external revenue contributed more to university finances than did recurrent allocations from the government. This study considered panel data on 55 universities in Kenya. A study by Murage and Onyuma's (2015) investigated the financial performance of income-generating activities in public institutes of higher learning (PHLIs) and used secondary data. The researchers established that internally generated activities are a profitable source of money to support PHLIs.

Chumba, Muturi and Oluoch (2020) examined green finance, unpacking donor funding and the financial sustainability of universities in Kenya. Secondary data was collected from public and private universities using census method. The study found a positive relationship between donor funding and financial sustainability of universities in Kenya.

Chumba, Muturi and Oluoch (2019) assessed on how financial investment techniques affected the sustainability of Kenyan colleges' finances. Descriptive design, questionnaires and linear multiple regression were applied. The study asserts that mobilization of resources may be necessary for boosting financial sustainability in universities. Roy (2016) asserts that funds from donations are usually provided to an organization to assist in activities to attain a sound financial position.

In addition, Mutinda and Ngahu's (2016) investigated the factors influencing financial sustainability in non-governmental (NGOs) organizations. The study collected data on Kenyan NGOs via questionnaires using stratified random sampling. The study found that financial resource mobilization has a non-significant impact on financial sustainability. Cheboi (2014) looked into how donor monies affected the effectiveness of organizations within Kenyan government ministries. The study used qualitative approach and multiple regression analysis. using total debt in government ministries as a control variable and established that donor funds have a negative and insignificant association with financial performance. Thelin and Trollinger (2019), Teferra (2015) found that contributions from corporations, agencies and individuals had insignificant effect on the total revenue. Most of these studies concentrated on the effects of donor funds in other organizations other than universities, while this study focused on the influence of endowment trust funds in universities in Kenya.

2.3.2 Debt Financing and Financial Sustainability

Long-term debts are borrowed funds by firms for a five-year period and above, while secured by permanent assets (Kimathi, 2019). The pecking order theory assumes that a firm prefers a logical order in choosing the source of finance. Therefore, universities prefer long-term debt to support long-term investments that generate sufficient returns to repay the principal amount, cover financial costs and retain surpluses over a period of time (Hashemi, 2013). Studies that support this theory on long-term debts suggest that long-term borrowings increase the returns on assets and profitability and improves the firm’s financial performance (Xu, Sun & Zhou, 2020; Obuya, 2017; Kimathi, 2019; Koskei, 2017; Lambe, 2014; Dube, 2013). Xu, Sun & Zhou (2020) investigated the relationship between debt financing and operating performance mediated by diversification in Chinese Stock Exchanges.

The study used secondary data and multiple regression. The researchers found that long-term debt had a negative correlation and significant effect to financial performance of firms listed at the Nairobi securities exchange.

Kimathi (2019) examined the effect of debt financing's impact on the public's universities in Kenya financial performance. Secondary data was sought from 31 public universities for a period of five years from 2014 to 2018.The investigation revealed that debt financing had a considerable negative effects on financial performance of public universities in Kenya. Obuya (2017) conducted a study on debt financing choices and the success of small and medium size enterprises (MSE). On the study, quantitative, descriptive, associative and predictive analyses were used. In addition, the pecking order, static tradeoff and optimal capital structure theories were used. The study found that using long-term debt had benefits, including the ability to deduct interest payments from income when calculating net taxable income, the fact that it was inexpensive and made planning easier because the interest rate was fixed and known in advance, which led to higher returns for the company. In contrast, Kenya universities do not pay taxes and hence the debt shield is not applicable.

Dube (2013) did research on how debt affects a company's profitability of SMEs in Zimbabwe. Secondary data was obtained for the study. The study revealed that long-term debt had a positive association with firm value. The recommendation was that level of leverage must be reasonable to evade high costs of finance which can deter SMEs from utilizing reserve funds. Koskei (2017) investigated the relationship between the financial performance of private sugar production enterprises in Kenya and surveyed on long-term debt ratio, debt to asset ratio and debt to equity ratio. The study relied on secondary data on all six private sugar manufacturing companies. The study revealed that long-term debt had an enhancing impact on financial performance of private sugar manufacturing companies in Kenya. A study by Lambe (2014) examined the effect of debt fund, capital mix on the firm value in the Nigerian stock exchange. Secondary and primary data were obtained through published reports and questionnaires respectively. The findings were that debt fund singling out long-term debt was significant and positively related to the value of firm.

In contrast, some studies have found negative effects of long-term debt on firm outcome (Ng'anga'a, 2017; Kajirwa, 2015; Saad, Ghani, Ahmed & Salim, 2015; Gabrijelcici, Herman & Lenarcici, 2016; Githaiga & Kabiru, 2015; Muchugia, 2013).

Ng'anga'a, (2017) studied the effects of debt financing and financial performance of secondary schools in Kajiado County, Kenya. A descriptive survey design was used and a census of 61 private secondary schools was carried out for a period of 3 years from 2014 to 2016. The study established that overall debt financing had positive and insignificant effects on financial performance of privately owned secondary schools in Kajiado County, Kenya. Kajirwa (2015) studied the influence of debt on firm the performance of commercial banks listed on Nairobi Securities Exchange. The study employed correlational and regression models. The results indicated that that leverage was negative and insignificant to the performance of commercial banks.

A study by Muchugia (2013) on the impact of debt financing and profitability of commercial banks in Kenya. Secondary data was collected and multiple regression analysis was applied. The researcher found that long-term loans had insignificant effects to profitability. The study concluded that the bank management feared using large proportions of long-term loans since they are relatively more expensive and may affect the profitability. The study was carried out on commercial bank and concentrated on debt financing and performance rather than financial sustainability of universities. Githaiga and Kabiru (2015) investigated on long-term debt and financial performance of SMEs in Kenya. Secondary data was collected and fixed effect model was used for analysis. The study results portrayed a reverse and insignificant effects of long-term debt and financial performance of SMEs. A study by Saad, Ghani, Ahmed and Salim (2015) investigated the effect of debt financing and equity on financial performance of SME in Malaysia. The study sampled 177 Malaysian SMEs which involved manufacturing and agricultural sectors. Ordinary least square method was applied. The study found that debt financing was positive and insignificant to financial performance.

Gabrijelcic et al., (2016) investigated the impact of financial debts and foreign funding on firm performance in Slovenia. Panel data was used which was collected through sampling method.

The study found insignificant negative effect of debt funds and firm's performance. Some studies on financing of firms that have used long-term debt have supported this view, while others have contradicted it. This raises the concern on how long-term debt can fully support the operations in Kenyan universities to be financially sustainable. Based on the pecking order theory that firms need to choose a financing option that maximizes profit, covers repayment and the related finance. This study therefore was anchored on pecking order theory.

Short-term debts are advances to a firm by financial institutions, usually for a period of four years or less (Kimathi, 2019). Short-term loans are borrowed by institutions to support on daily operations in the cases of inadequate cash flow. Myers and Majluf (1984) argue that firms with high profits need not acquire risky financing since they can support their cash flow. However, firms borrow short-term loans as they do not need to be secured by virtue of the firm's good performance (Obuya, 2017). Empirical studies on short- term debts (Lambe, 2014; Dube, 2013; Kimathi, 2019) reported a strong and enhancing relationship between short-term debt and company performance. Kimathi (2019) examined the effects of debt financing on financial performance of public universities in Kenya. The study considered short-term debt, long-term debt and trade credit as indicators. Secondary data was sought from 31 public universities for a period of 5 years from 2014 to 2018. This study considered both public and private universities for 6 years from 2015 to 2020.

Lambe (2014) examined the effects of debt funds, capital mix and the firm value in Nigerian stock exchange. Secondary and primary data were obtained through published reports and questionnaires respectively. The findings were that debt funds which included short-term debt was significant and positively correlated with the value of the firm. Dube (2013) conducted a study on the effect of debt and profitability of SMEs in Zimbabwe. Secondary data was obtained for study analysis. The study revealed that debts, in particular short-term debt had positive relationship with firm value. Onchong'a, Muturi and Atambo (2016) carried out a study on the effects of leverage financing in financial performance of selected firms listed in Nairobi Stock Exchange. Secondary data was sought from 60 firms listed in Nairobi Stock Exchange for a period from 2009-2015.

A study by Ebaid (2013) examined the impact of capital structure choice of firm performance in Egypt and used Ordinary least square method was used on secondary data obtained. The study found that short-term loans revealed conflicting effect on MSEs financial performance measured by gross profit margin. However, Makanga (2015) looked at the impact of debt financing on financial performance of the firms listed in the Nairobi Securities Exchange. The study used a quantitative research design and analyzed using linear regression model. The study revealed that short-term loans had a negative association with return of asset and significant.

Trade credit is a short-lived debt that is provided by suppliers to customers after purchasing goods and services for sale. Trade credit is a debt finance option used by firms since the security and credit rating of the customer is not required (Vicente & Emilia, 2017). The pecking order theory argues that firms utilize available internal financing sources before opting for external funding. Trade credit is an external debt from purchases, hence more preferred to bank loans in financing unforeseeable cash flow problems (Obuya 2017). Trade credit is highly advantageous because firms do not pay upfront upon the delivery of goods, allowing them to utilize the funds over time and pay later (Metto & Ombaba, 2021). Consequently, trade credit is said to have liquidation costs, which may force firms to seek other financing options (Vicente & Emilia, 2017). Several empirical studies have shown that debt from trade credit positively influence firm returns (Metto & Ombaba, 2021; Karuma, Ndambiri & Oluoch 2018; Kapkiyai & Mugo, 2015; Katiwa, 2017; Tang, 2014; Sola, Teruel & Salano, 2020).

Metto and Ombaba (2021) studied debt financing and financial sustainability, particularly trade credit financing on private secondary schools in Uasin Gishu County. A descriptive survey research design and stratified random sample techniques were used. Data was analyzed through descriptive statistics and inferential statistics. The study established a positive and significant effects of debt financing on financial sustainability. This study applied longitudinal survey design and random effects model on public and private universities in Kenya.

Kapkiyai and Mugo (2015) did a study on the impact of trade credit on financial performance of private schools in, Kenya. Documentary guide was used in the study to collect secondary data. Analysis was conducted using both inferential and descriptive statistics specifically mean and standard deviation. The study found that trade credit positively affected liquidity, return on assets and profit margin. The study however, dealt with financial sustainability of private secondary schools in Eldoret Town and not universities in the entire country.

Katiwa (2017) did a study on the effect of trade credit on share value of private secondary schools. Secondary data was obtained for a period of 5 years from 2012 to 2016. The study employed a descriptive cross-sectional research design and a multiple linear regression model was used to analyze the variables. The results revealed that individually, trade credit and assets of the firm are statistically significant determinants of value of private secondary schools while capital structure is an insignificant determinant. This study left gaps since it concentrated on the impact of trade credit on financial sustainability of private secondary schools and not universities in Kenya.

Tang (2014) in a study investigated influence of trade credit and profitability of schools in Netherlands for the period between 2009 and 2013. The study used descriptive analysis and considered 71 schools in Netherlands. The study established that trade credits positively related with profitability. This study however left gaps in that it was done among schools in Netherlands while the current study will be specific to universities in Kenya.

Sola et al., (2020) examined the consequences for client financing's profitability for a sample of 11,337 Spanish institutions of learning during the period 2015–2019. The study found a positive linear relationship between trade credit and business success that results from the fact that trade credit's advantages outweigh its disadvantages. This study was done with regard to financing institutions of learning while the current study seeks to fill this gap by finding out the effect of trade credit on universities in Kenya. Karuma et al., (2018) examined debt financing's effects on the financial performance of manufacturing enterprises in Nairobi Security Exchange(NSE). Quantitative, descriptive and multiple linear regression analyses were used.

The study found a significant effect between accounts payable and return on assets of manufacturing firms in NSE. The conclusion was that good credit rating results to better offer rates leading to higher return on equity for the businesses.

In contrast, Mwangangi (2013) conducted a research on the correlation between trade credit and the performance of non- financial companies listed at NSE. This research used panel data for the period 2013 to 2017. Descriptive and correlation analysis were used and sampled 39 non- financial companies listed at NSE. Regression analysis was applied to ascertain the relationship existing between trade credit and the value of firms. The research found negative, insignificant relationship between trade credit and the value of the firm. The study however dealt with performance of non- financial companies and not financial sustainability of universities in Kenya. Other studies that have reported contradictory results of trade credit and firm returns (Cecchet, Mohanty, & Zampolly, 2011; Hashemi, 2018; Cunat & Garcia, 2012; Harash, Al-Timimi, & Alsaadi, 2014). Therefore, after evaluating the findings of these studies this study sought to established the influence of debt financing on financial sustainability of universities in Kenya.

2.3.3 Financing options and financial sustainability

This study assessed the relationship between financing options and financial sustainability of universities in Kenya. Financing options is providing various financial resources, usually in form of money to a person, a company, or any other private or public organization. Pius (2014) did a study on funding sources in higher education in Ghana. Primary data, ordinary least square method were used. The study found a positive and statistically significant relationship between funding sources and financial sustainability of higher education in Ghana. Maria and Bleotu (2013) conducted a study on Modern higher education trends funding in Europe.

Descriptive survey primary method of collecting data was used. The study found a significant influence of sources of finances on performance of European higher education. Thomas (2015) examined funding sources on financial sustainability of European higher education institutions. Secondary data was obtained and analyzed by multiple linear regression. The study found that funding sources were the key income structure influencing financial sustainability in European higher education institutions.

2.3.4 Financing Options, Institutional Characteristics and Financial Sustainability

Institutional characteristics are behavioural traits of an organization that are considered highly important for determining the funding pattern. There is no agreed definition of institutional characteristics, but what matters is how well the key elements of an institution interact within a dynamic environment to achieve the set goals and objectives. Migin, Falahat, Yasid and Khatibi, (2015) investigated the effects of institutional characteristics in private higher education institutions in Malaysia. Methodically, descriptive survey and collected data through structured questionnaires. The study considered institutional characteristics such as type of academic progarmmes, reputation and number of academic programmers. The study found that reputation showed no correlation with financial performance, while academic progarmmes were positively correlated and significant. Waithaka (2018) examined the effect of corporate identity management practices, organizational characteristics, corporate image on brand performance of Kenyan universities. Primary and secondary data were used to collect data and analyzed by descriptive survey and linear regression. The study found that organizational characteristics influence the range of business activities such as research and development (R & D) initiatives as well as ability to adopt technological innovations.

Teixeira, Rocha, Biscaia and Cardeso (2014) conducted a study on revenue diversification in public higher education and compared polytechnic and university sectors. The study established that revenue diversification was positively and statistically significant to financial performance moderated by institutional characteristics. Interviews were used to collect data and applied predictive model. The study further explained that institutional characteristics are significant determinants of higher education institutions with the ability to earn income from tuition fees and other non- public sources.

Kuffor and Peprah (2020) studied the correlate between income diversification and financial sustainability of private tertiary institutions as moderated by profile. Primary data was collected using questionnaires on forty-four private tertiary institutions in Ghana. The study revealed a significant and moderation effect of institutional profile on income diversification and financial sustainability of private tertiary institutions in Accra, Ghana.

Other studies that indicated positive and significant moderation effect of firm characteristics (Nyongesa, 2017; Hossaina & Khan, 2016; Ibrahim, Ahamed & Minai, 2018; Lambinicio, 2016; Sakawa & Watanabel, 2020; Kaguri, 2013). On the other hand, (Ahmed, Zeng, Sinha, Flavell & Massoumi, 2017; Kiganane, Bwisa & Kihoro, 2018; Malik, 2011) reported a negative and insignificant moderated results of firm performance. Some of the studies used institutional characteristics as an independent variable while this study considered it as a moderating variable between financing options and financial sustainability. The study also applied institutional characteristics that are directly related to universities as other studies used characteristics appropriate to their areas of study.

2.3.4 Financing Options, Funds Utilization and Financial Sustainability

This study investigated the mediating influence of funds utilization on the relationship between financing options and financial sustainability of universities in Kenya. The utilization of funds considered in this study were recurrent expenditure and capital expenditure. Funds utilization refers to how resources can be used efficiently for value creation and sustainability. Empirical studies that have considered expenditure as a mediator (Imana, 2017; Newman, 2013; Oseni, 2019; Omokri, Agbedeyi, Nwaje & Agiligia, 2018; Mohmood, 2015; Elsivera & Abdallah, 2017). Imana, (2017) investigated on the determinants of public education expenditures in Kenya. Descriptive research design, quantitative approach, secondary data and multiple regression analysis were applied for the study. The study established mediation effect of expenditure on income and performance of public education in Kenya. Oseni, (2019) did a study on adequacy of budgetary allocation to education institutions in Nigeria. Descriptive, co-integration techniques and VAR model were used. The study established a negative and significant mediating effect of expenditure on institutional performance.

A study by Newman (2013) on budgeting and fund allocation in higher education in Ghana, revealed that increasing staff expenditure above planned budget of tertiary institutions had a negative effect on financial performance. Explanatory design and questionnaires were used in the study. Omokri et al., (2018) studied the mediating effect of recurrent expenditure on crude oil and economic growth in Nigeria. Statistical mediation, causal steps and product of coefficients were used. The study found that a m

recurrent expenditure had a mediation effect on the relationship between crude oil and economic growth in Nigeria. Mohmood (2015) did a study on the mediating effect of advertising expenditure on the relationship between total effects and labor productivity of manufacturing Industries in Pakistan. A case study through census on 229 manufacturing industries for a period 2015 to 2016. The study found a mediation effect of advertising expenditure on the relationship between total effects and labor productivity in Pakistan manufacturing industries. Iheanacho (2016) documented significant mediating effect of recurrent expenditure on the relationship between short run and economic growth in Nigeria.

This study contradicts the work of Elsivera and Abdallah (2017) on mediating effect of capital expenditure on the relationship between revenues, allocation of fund on economic growth of Bengkulu province in Indonesia. Secondary data and fixed effect model was considered for the study. The study found that capital expenditure did not mediate the relationship between generated revenue on funds allocated and economic growth. Kato (2019) investigated the mediating effect of organizational resources on the relationship between strategy implementation and performance of devolved ministries among selected counties in northern Kenya. A census design was adopted. Primary data was collected through close-ended questionnaires. The study established no mediation effect of organizational resources on the association between strategy implementation and performance of devolved ministries in Kenya. The utilization of funds affected the financial outcome and growth in diverse ways in these studies due to the various aspects considered, the country difference and the sectors under the study. Therefore, this study considered the findings of these studies and assessed the mediating influence of funds utilization on the relationship between financing options and financial sustainability of universities in Kenya.

2.3.5 Financial Sustainability

Financial sustainability is the ability of income or revenue of an organization to cover its operational costs for a sustainable future (Bowman, 2011; Mutinda & Ngahu, 2016**).** Literature suggests that financial sustainability in HEIs is achieved where the institution generates sufficient revenue to allow it to finance academic and research ventures (Sazonov et al., 2015).

Universities with sound income structures, such as public funding, tuition fees and internally generated income will be able to cope with the challenge of financial un-sustainability (Estermann & Pruvot, 2014).

A study by Cernostana (2017) focused on financial sustainability of European universities. A case study was use. The study established that long term stability of an institution is defined by its financial sustainability. Nganga and Kibati (2016) assessed on what determine financial sustainability in privately owned middle level colleges in Nakuru County, Kenya with specific emphasis on the effect of resource allocation on financial sustainability. Descriptive survey design and questionnaires were used. The study found that resource allocation had significant influence on financial sustainability. The study was done in private middle level colleges and considered resource allocation while this study concentrated on financing options in universities.

Ngenoh (2020) conducted a comparative study on the influence of third stream activities on university sustainability. The study used qualitative and quantitative data from two universities in Kenya. The study found a positive significant influence of third stream activities on university sustainability. The study compared only two universities by assessing third streams activities on sustainability while this study did a comparative analysis on 31 public and 24 private universities, considered various revenue streams, a moderating and mediating factor. The reviewed literature formed the basis of this study since most of the studies did not consider other factors affecting financial sustainability other than independent variable. In addition, most studies did not make a comparative of public and private universities.

2.4 Conceptual Framework

Figure 2.1 shows the conceptual framework for this study. As shown, there were four sets of study variables. These were independent, moderating, mediating and dependent variables. Independent variables included revenue streams and debt financing which formed the financing options. Funds utilization was a mediating variable. Institutional characteristic was the moderating variable.

Financial sustainability was the dependent variable. Each of these variables was operationalized by specific indicators as shown in Figure 2.1.

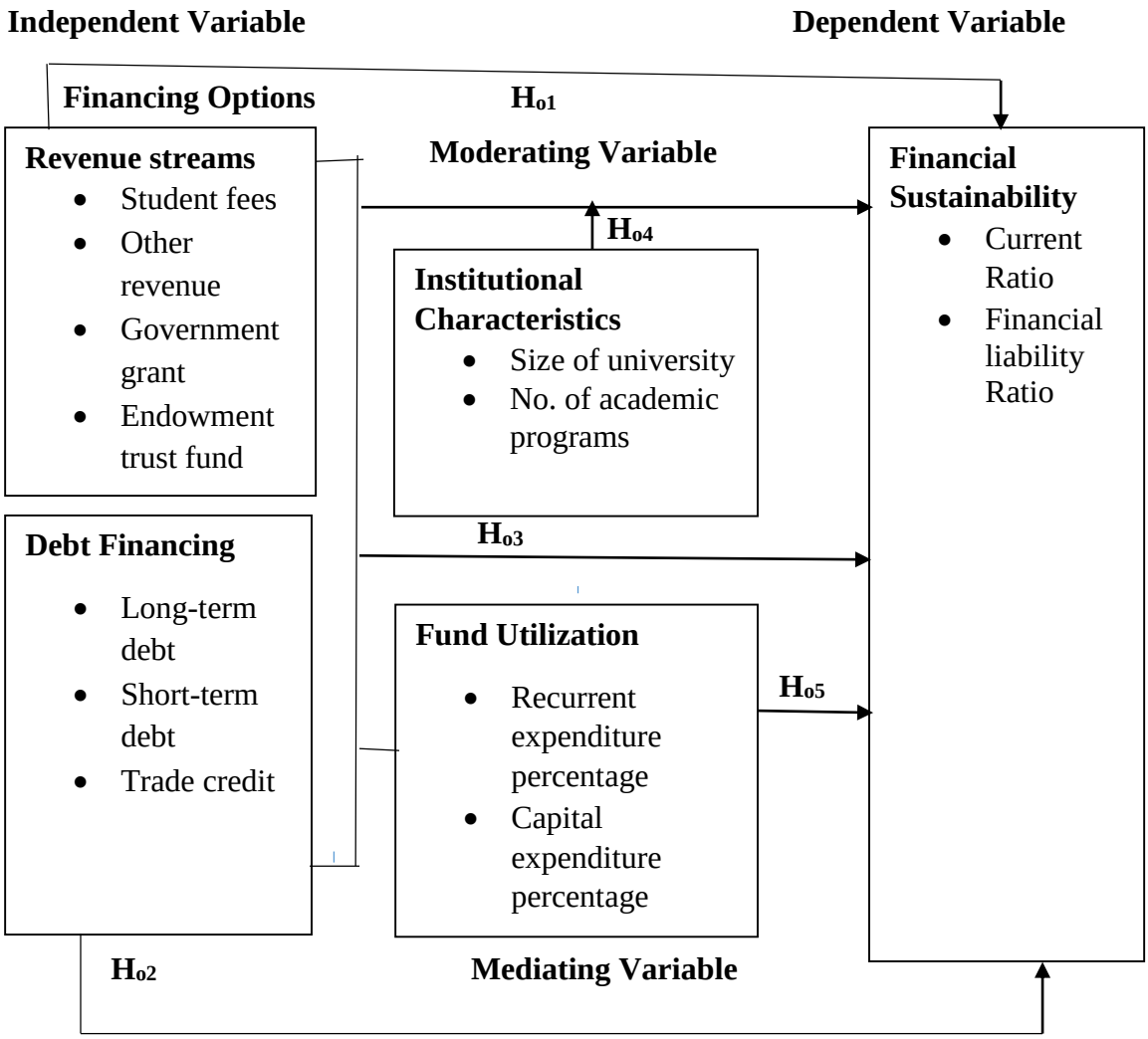

Figure 2.1 Conceptual Framework

2.5 Summary of Literature Review

The extant literature on financing options (revenue streams and debt financing) institutional characteristics funds utilization and financial sustainability of universities give theoretical and contextual gaps. Revenue dependency theory argues that resources are critical to organizational success. Revenue theory of cost posits that the unit cost of HEIs is determined by the revenue available for allocation but not by rigid technological requirements. Pecking order theory proposes that firms can be financed through external source of funds in order to meet their obligations. The empirical studies indicate that even when similar variables were used, conflicting results were obtained.

Some of the studies indicate that there is a positive relationship between revenue streams indicators like government grant, student fees, other revenue, endowment trust funds and the outcome (Mutiso et al., 2015; Panigrahi, 2018; Ahmed et al., 2019; Estermann 2020; Webb, 2015; Lee et al., 2020; Afriye, 2015; Chumba et al., 2020; Hussin & Rashid, 2017) while others indicate that there was negative relationship (Siraj et al., 2019; Mutinda & Ngahu, 2016; Cheboi, 2014). Some of the studies (Obuya, 2017; Kimathi, 2019; Koskei, 2017; Lambe, 2014; Dube, 2013) indicated a significant effect on debt financing and firm returns while others (Ng'anga'a, 2017; Kajirwa, 2015; Saad, Ghani, Ahmed & Salim, 2015; Gabrijelcici et al., 2016; Githaiga & Kabiru, 2015; Muchugia, 2013) indicated an inverse relationship. Further, most of the studies (Migin et al., 2015; Waithaka, 2018; Teixeira et al., 2014; Kuffor & Peprah, 2020) have focused on the moderating influence of organizational characteristics rather than the influence of the specific institutional characteristics which are size of university and academic programmers. Further, some studies (Imana, 2017; Omokri et al., 2018; Mohmood, 2015; Elsivera & Abdallah, 2017) employed expenditure as a mediator appropriate to their area of study rather than directly related to universities. This implies that the studies did not find a comprehensive relationship among financing options (revenue streams and debt financing) institutional characteristics, funds utilization and financial sustainability of universities.

2.6 Research Gaps

The empirical review discussed the past studies on the objectives of the study and various gaps were established. Most of the studies used descriptive, exploratory and case study approaches, while this study applied longitudinal survey design. Several studies done focused on general HEIs as opposed to universities. The studies concentrated on factors and challenges rather than influence of financing options and ignored the moderating and mediating variables as factors influencing financial sustainability. Some of the studies considered moderating features appropriate to their area of study as opposed to universities. The research gaps are summarized in Appendix III. The present study is therefore an attempt to fill these gaps by assessing the influence of financing options on financial sustainability, moderated by institutional characteristics and mediated by funds utilization of universities in Kenya.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter covers the research philosophy, research design, theoretical framework, study population, data collection instruments, data collection procedures, operationalization and measurement of study variables, pretesting of research instruments, data analysis and presentation**.**

3.2 Research Philosophy

This study adopted positivist research philosophy. This was appropriate because the study investigated the relationship among financing options, funds utilization, institutional characteristics and financial sustainability of universities empirically using quantitative data. The study appreciated the positivism ontology which emphasize that quantitative approach was based on objectivity, real facts, neutrality, measurement and validity of results (Cooper & Schindler, 2011). The study was also founded on theories that were used to generate hypotheses which were tested to give statistical justification of conclusions from the empirically testable hypotheses (McMillan & Schumacher, 2019).

3.3 Research Design

The study carried out a comparative analysis and employed longitudinal survey design since the data was collected from 2015 to 2020. The design was appropriate because it offered an opportunity to test hypotheses, measure, analyze and describe the effect and relationship between the variables using panel data. Panel data was adopted because it took care of heterogeneity associated with individual institutions by allowing for individual specific variables. Panel data provides more informative, more variability, less collinearity among variables, more degrees of freedom and efficiency. Besides, panel data minimizes bias that can result if individual institutions are aggregated (Ogboi & Unuafe, 2018).

3.4 Theoretical Framework

The study adopted the theory of production advanced by Wicksell (1916) to examine the relationship between financing options, funds utilization, institutional characteristics and financial sustainability.

The theory asserts that the output of a given firm is a function of invested inputs which include land, labor and capital. Based on the theory, the study assumed that the variables in the study have an input and output relationship.

Financial sustainability of an institution or the dependent variable was regarded as the output which was achieved through combination of inputs or independent variables which were revenue streams and debt financing, funds utilization as mediator and institutional characteristics which was the moderating variable.

The study also adopted the model developed by Cobb and Douglas (1928) who empirically tested the theory and established the production function indicated in equation 3.1.

$P(l,k) = \mathrm{b}\, l^{\alpha} k^{\beta}$ ……..3.1

Where

P is total production, L is labor input, K is capital input, b is total factor productivity

α and β are the output elasticities of labour and capital respectively.

Taking logarithm on both sides of equation 3.1

Log Y = log b + α log L + β log K ….....3.2

By letting log Y = y, log b = β_0, log L=l and log K= k, equation 3.2 can now be expressed as shown in equation 3.3

$y = \beta_0 + \alpha l + \beta k$ ……3.3

Given that the independent variables can be presented as x, the study employed the functional relationship shown in equation 3.4

$y = f(x)$……..3.4

Where, x is a row vector.

3.5 Study Population

The target population for the study was 65 universities in Kenya. The study focused on both public and private universities which had been in operation for six years and more, registered by the Commission for University Education, as at December 2020 as per Appendix II. The period of six years was chosen because this was the period when all students who attained grade C+ and above translating to 100% transition were enrolled to both public and private universities.

In addition, the implementation of DUC kicked off and finally, the adverse effect of corona virus. The final sample used in this study comprised of 55 (31 public and 24 private) universities that availed the data. The data considered met the requirements for panel data analysis.

3.6 Data Collection Instruments

The study used secondary data collected from the annual financial statements and reports of all the universities covering a six-year period from the year 2015 to 2020. Kothari (2004) states that secondary data is data collected by someone else and which have already been passed through the statistical process. The panel data retrieval sheet is presented in Appendix I.

3.7 Data Collection Procedures

To enable the collection of data, a research permit was obtained from the National Commission for Science, Technology and Innovation. The research assistants were identified and trained by the researcher on how to retrieved data which included familiarization with research instruments, communication with respondents and research ethics. The researcher with the help of research assistants collected secondary data for public universities from Kenya Office of Auditor General website, universities websites, reports and journals from Ministry of education. The secondary data for private universities was collected from their websites and physical visit to the universities as per Appendix II.

3.8 Operationalization and Measurement of Study Variables

The study objectives, variables, indicators for each variable, measurement scale and type of analysis done are shown in Table 3.1

Table 3.1 Operationalization and Measurement of Study Variables

Variable	Indicators	Operations Definition	Measurement	Analysis/ Model
Revenue streams (Independent variable)	Student fees	Revenue earned from offering academic services	Total fees to total revenue	Quantitative/ Panel
	Other revenue	Revenue earned from commercial services other than fees from students	Other revenue to total revenue	Quantitative/ Panel
	Government grant	Funds received from the government which comprises of capitation, research and development.	Total government grant amount to total revenue	Quantitative/ Panel
	Endowment trust funds	Donations from third parties	Endowment trust funds amount to total revenue	Quantitative/ Panel
Debt financing (Independent variable)	Long-term debts	Borrowed funds with a repayment period of 5 years and above.	Long-term debts amount to total debts	Quantitative/ Panel
	Short-term debts	Borrowed funds with a repayment of 4 years and less, including bank overdrafts.	Short-term debts amount to total debts	Quantitative/ Panel
	Trade credit	This is a financing that is interest free and is obtained by deferring payments at a later date.	Accounts payable to total debts	Quantitative/ Panel
Funds utilization (Mediating variable)	Recurrent expenditure percentage	Recurring expenses that are incurred in running of the institution.	Recurrent expenditure to percentage of total expenditure	Quantitative/ Panel
	Capital expenditure percentage	Expenses that are incurred in acquisition or building up fixed assets.	Capital expenditure to percentage of total expenditure	Quantitative/ Panel

Variable	Indicators	Operations Definition	Measurement	Analysis/ Model
Institutional Characteristics (Moderating Variable)	University size	The is the population of students in a university	Number of students	Quantitative/ Panel
	Number of academic programs	A combination of courses and related activities organized for the achievement of specific learning outcomes as defined by the university	Number of academic programs	Quantitative/ Panel
Financial Sustainability (Dependent Variable)	Current Ratio	A ratio to measure institution's short-term liquidity position with respect to available current assets against current outstanding liabilities.	Current assets to current liabilities	Quantitative/ Panel
	Financial liability ratio	A ratio to measure the institution's solvency in regard to total liabilities and total revenue.	Total debts to total revenue	Quantitative/ Panel

3.9 Pretesting of Research Instruments

Pretesting was done to establish validity of the research instruments. The study used secondary data thus content validity of the record survey sheet was evaluated by seeking the opinions of experts in the field of study. This enabled the necessary modification and revision of the research instruments to enhance the validity.

3.10 Data Analysis Techniques

This section elaborates the methodology used in the analysis of each study variables. E-views statistical package was used to analyze the data. Descriptive statistics was used for measures of central tendencies including mean and standard deviation. The coefficient of correlation **r** was applied to measure the degree of influence of each independent variable (revenue streams and debt financing options) on the dependent variable which was financial sustainability. Pearson (r) was used in this study to determine the nature and strength of the relationship among variables. Kothari (2004) posits that Pearson's correlation coefficient technique is recommended for this category of data since it is the most appropriate for determining relationships. To test hypothesis, multiple linear regression models were used to test significance between each independent and dependent variable. In this study the significance level for hypotheses testing was set at 0.05 since it is the preferred critical value for null hypothesis.

The following multiple linear regression models were applied;

Equation for objective 1

$$FS_{it} = \beta_0 + \beta_1 GG_{it} + \beta_2 SF_{it} + \beta_3 OR_{it} + \beta_4 ETF_{it} + \varepsilon_{it} \quad \ldots\ldots 3.5$$

Equation for objective 2

$$FS_{it} = \beta_0 + \beta_1 LTD_{it} + \beta_2 STD_{it} + \beta_3 TC_{it} + \varepsilon_{it} \quad \ldots\ldots 3.6$$

Equation for objective 3

$$FS_{it} = \beta_0 + \beta_1 GG_{it} + \beta_2 SF_{it} + \beta_3 OR_{it} + \beta_4 ETF_{it} + \beta_5 LTD_{it} + \beta_6 STD_{it} + \beta_7 TC_{it} + \varepsilon_{it} \quad \ldots\ldots 3.7$$

Where, FS_{it} was financial sustainability, β_0 was the regression constant, β_1 …. β_7 were coefficients, i was 1, 2, …, 55 universities, t was 1, 2, …, 6 years, GG was government grant, SF was student fees, OR was other revenue, ETF was endowment trust funds, LTD was long-term debt, STD was short-term debt, TC was trade credit and ε_{it} was the error term.

To test the moderating influence of the institutional characteristics (IC) on the relationship between financing options (FO) and financial sustainability (FS), a hierarchical multiple regression analysis was used. The first step involved assessing the relationship between independent variables, (financing options) and moderator (institutional characteristics). The second step involved the independent variables and moderator being entered into the model as predictors of the outcome variable which is financial sustainability. The relationship between financing options and institutional characteristics assessed whether the relationship accounts for additional variance in the dependent variable beyond that explained by financing options and institutional characteristics in step one. The third step involved interaction of financing options and institutional characteristics as predictors of the outcome variable which is financial sustainability. The moderator effect is present if the interaction term explains a statistically significant amount of variance in the dependent variable. Baron and Kenny (1986) model was used to test the moderation effect of institutional characteristics on financing options and financial sustainability of universities in Kenya. The interaction model is as follows;

$$FS_{it} = \beta_0 + \beta_1 FO_{it} + \beta_2 IC_{it} + \beta_3 FO^{*} IC_{it} + \varepsilon_{it} \quad \ldots\ldots 3.8$$

Where

FS_{it} was financial sustainability, β_0 was the regression constant, i was 1, 2, …, 55 universities, t was 1, 2, …, 6 years, FO was composite index of financing options, IC was composite index of institutional characteristics, β_1 is coefficient of composite index of financing options, β_2 was coefficient of moderator that was institutional characteristics, β_3 was coefficient of interaction of composite of financing options and moderator that is institutional characteristics. The coefficient β_3 was used to indicate the influence of moderating variable that is, institutional characteristics on the relationship between financing options and financial sustainability of universities in Kenya.

To examine the mediating influence of funds utilization on the relationship between financing options and financial sustainability, Baron and Kenny's (1986) four step procedure was adopted.

Several regression analyses were carried out and the significance of coefficients examined in each step. The first step involved a simple regression analysis with the independent variable (FO) predicting the dependent variable (FS).

In the second equation, a simple regression analysis with the independent variable (FO) predicting the mediating variable (FU) was done while in the third step a simple regression analysis was carried out with the mediating variable (FU) predicting the dependent variable (FS). The last step involved carrying out a multiple regression analysis with the independent variable (FO) and mediating variable (FU) predicting the dependent variable (FS). The purpose of steps one to three was to establish if zero-order relationships among the variables existed and if they were statistically significant in order to proceed to step four. Support for full mediation would be confirmed if financing options was no longer statistically significant with funds utilization.

If both financing options and funds utilization were statistically significant, the findings would support partial mediation. Perfect mediation attest if the independent variable has no effect when the mediator is controlled (Baron & Kenny, 1986).

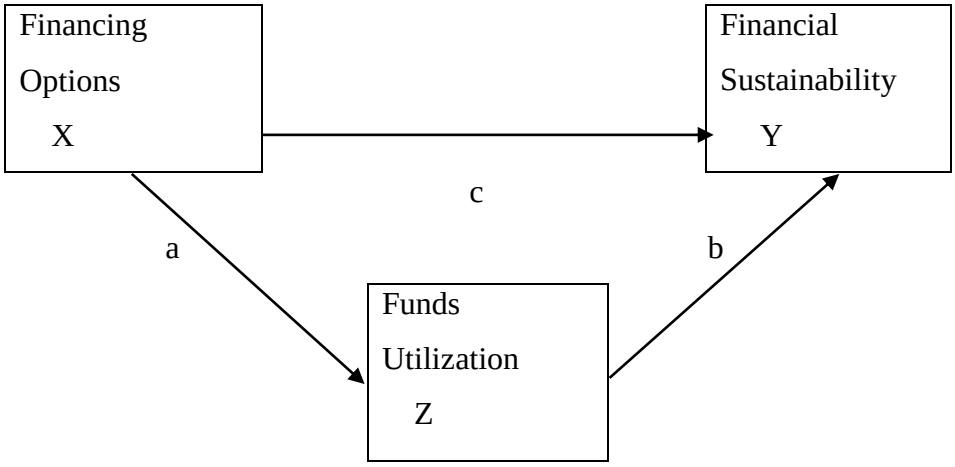

Figure 3.1Baron and Kenny (1986) Model

The first step was to assess the relationship between dependent and independent variable using the following regression model:

$$FS_{it} = \beta_0 + \beta_1 GG_{it} + \beta_2 SF_{it} + \beta_3 OR_{it} + \beta_4 ETF_{it} + \beta_5 LTD_{it} + \beta_6 STD_{it} + \beta_7 TC_{it} + \varepsilon_{it} \ldots\ldots\ldots\

revenue, LTD was long-term debt. STD was short-term debt, TC was trade credit and ε was the error term. The results were interpreted that a relationship existed if at least one of β_1 ..... β_7 was significant.

The second step was to assess the relationship between the mediating variable and independent variable using the following regression model:

$$FU_{it} = \beta_0 + \beta_1 GG_{it} + \beta_2 SF_{it} + \beta_3 OR_{it} + \beta_4 ETF_{it} + \beta_5 LTD_{it} + \beta_6 STD_{it} + \beta_7 TC_{it} + \varepsilon_{it} \ldots\ldots\ldots\

government grants, SF was student fees, ETF was endowment trust funds, OR was other revenue, LTD was long-term debt. STD was short-term debt, TC was trade credit, RE was recurrent expenditure, CE was capital expenditure and ε was the error term.

3.11 Panel Model Specification Test

To determine the nature of the panel data and the best model for analysis, Breusch Pagan LM test and hausman test were carried out. Breusch Pagan LM test was conducted to test the pooled ordinary least squares (OLS) constant intercept slope that may vary overtime and whether the model is fit for the study analysis. Hausman test was conducted to determine whether fixed effect model or random effect model was appropriate for further statistical analysis. To check for omitted variables that may lead to changes in cross-sectional and time series intercept fixed effect model was used. Further random effect model was used to check whether there could be efficiency improvement of least square estimation process by accounting for time series and cross-sectional disturbances. In addition, multicollinearity, heteroskedasticity, normality and independent test were tested. A summary of the test carried out and the criteria for making the decision is presented in Table 3.2.

Table 3.2 Panel Data Diagnostic Tests

Test	Applied test	Conclusion
Independent	Durbin–Watson statistic	There is no first order linear auto-correlation in the multiple linear regression data if P value is $1.5 < d < 2.5$.
Multicollinearity Test	Variance Inflation Factor (VIF) Test	No multicollinearity in the multiple linear regression model if all the variables meet the Tolerance threshold of $0.1 < VIF < 10$.
Heteroskedasticity	White test	If P value is < 0.05, presence of Heteroskedasticity is evident.
Normality	Jacque-Bera	If $P > 0.05$ then this implies normality
Use of pooled or random effects model	Breusch Pagan LM test	If P value > 0.05, use pooled effects model.
Random or fixed effects	Hausman test	If p value > 0.05, use random effects model.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents the findings of the study. The chapter is divided into sections as follows: Section 4.2 presents the success rate of the study. Section 4.3 presents descriptive analysis of all the study variables. Section 4.4 presents correlation analysis of the study variables. Section 4.5 presents necessary assumption test for panel data and regression analysis.

4.2 Success rate

The study focused on public and private universities from the year 2015 to 2020. The success rate of available data for public universities was 100%, while private was 71%. This was considered adequate given the recommendations by Babbie (1990) who suggested on success rates exceeding 50% as adequate, 60% as good and above 70% rated very good. Based on these assertions, the success rate for this study was very good. Table 4.1 shows the breakdown of the universities for which data was available.

Table 4.1 Success Rate

University	**Target**	**Actual**	**Percent of Actual to Target %**
Public	31	31	100
Private	34	24	71
Total	65	55	86

4.3 Descriptive Statistics

This section presents the descriptive statistics of the independent, moderating, mediating and dependent variable. Table 4.2 and 4.3 presents the descriptive analysis results of public and private universities respectively.

Table 4.2 Descriptive Statistics for Public Universities

Variable	Indicator	N	Mean	Std. Dev.	Max.	Min.
Dependent (FS)	Current ratio	186	1.023	0.062	1.095	0.953
	Financial liability ratio	186	0.494	0.037	0.555	0.322
Independent (RS and DF)	Government grant	186	0.434	0.011	0.477	0.405
	Students fees	186	0.359	0.150	0.387	0.336
	Other revenue	186	0.034	0.007	0.050	0.019
	Endowment trust fund	186	0.028	0.019	0.056	0.000
	Long-term debt	186	0.687	0.247	0.376	0.176
	Short-term debt	186	0.178	0.216	0.255	0.099
	Trade credit	186	0.562	0.115	0.762	0.612
Institutional Characteristics (IC)	University size	186	40193	15015	70223.00	10163.00
	Academic programs	186	457.5	130.00	900.00	15.00
Funds Utilization (FU)	Recurrent expenditure	186	0.823	0.524	0.863	0.652
	Capital expenditure	186	0.177	0.112	0.144	0.104

Table 4.3 Descriptive Statistics for Private Universities

Variable	Indicator	N	Mean	Std. Dev.	Max.	Min,
Dependent (FS)	Current ratio	144	1.091	0.334	1.263	0.729
	Financial liability ratio	144	0.362	0.040	0.458	0.300
	Student fees	144	0.710	0.12	0.727	0.690
	Other revenue	144	0.145	0.005	0.153	0.138
Independent (RS and DF)	Endowment and trust funds	144	0.241	0.010	0.269	0.223
	Long-term debt	144	0.643	0.258	0.777	0.509
	Short-term debt	144	0.219	0.244	0.250	0.129
	Trade credit	144	0.293	0.321	0.283	0.153
Institutional Characteristics (IC)	University size	144	13971.5	645.00	26357.00	1586.00
	Academic programs	144	21.00	9.00	33.00	9.00
Funds Utilization (FU)	Recurrent expenditure	144	0.528	0.161	0.532	0.322
	Capital expenditure	144	0.172	0.190	0.174	0.131

Current ratio as measured by current assets to current liabilities had a mean of 1.02 with a standard deviation of 0.062 for public universities and 1.09 with standard deviation of 0.166 for private universities. This showed that on average the current ratio for public and private universities was less than 1.5. Robert and Reece (1989) assert that current ratio level depends on the type of the business, but the general rule of thumb is that it should be at least 1.5:1. This implied that public and private universities have inadequate cash and short term convertible assets to cover current debt and other payments. In other words, all the universities were illiquid since their finances were not fully able to support the current obligations. The value for standard deviation imply that the liquidity levels for all the universities have less variations.

Tables 4.2 and 4.3 on financial liability ratio as measured by total debt to total revenue show that public universities had a mean of 0.494 with a standard deviation of 0.037 and 0.362 with a standard deviation of 0.104 for private universities.

This implied that public universities had total debts of 49.4% of total revenue and private universities had total debts of 36.2% of total revenue. Kelchevskaya (2014) recommended that a liability ratio between 15% and 20 % of total income is considered good. The results indicate that public and private universities were above the range, since the percentages are more than the recommended range which is considered purely risk perspective. This meant that the universities had over utilized borrowed funds which showed inadequacy of funds to inject to investments and also support their operations. This further explains the insolvency of universities since the borrowed funds had exceeded the recommended limit. The value for standard deviation indicate that the insolvency ranges in both public and private universities.

Table 4.2 indicates that government grant had an average of 0.434 with a standard deviation of 0.011. The results implied that 43.4% of total revenue are funds received from the government to cater for operations in public universities. The results confirm insufficiency of funds disbursed to public universities from the government. Table 4.2 and 4.3 show that student fees as measured by total fees to total revenue had an average of 0.359 with a standard deviation of 0.15 for public universities and 0.710 with a standard deviation of 0.12 for private universities. This implied that private universities mostly dependent on fees from students to support their operations more than public universities. The value for standard deviation show that the amount of government grants received by public universities ranges proportionately.

Other revenue had an average of 0.034 with a standard deviation of 0.07 for public universities and 0.145 with a standard deviation of 0.005 for private universities. The results indicate that other revenue contributed an average of 3.4% for public universities and 14.5% for private universities towards financing the operations. The results implied that both public and private universities were not able to generate sufficient income to support government grant and fees income. The standard deviation results depict that none of the universities earns more revenue from other internally generated activities.

On the other hand, endowment trust funds had an average of 0.028 with a standard deviation of 0.012 for public universities and 0.241 with a standard deviation of 0.010 for private universities.

It can be observed that private universities received more endowment trust funds compared to public universities. This could imply that private universities were able to attract third party partnership who had contributed to the endowment kitty and trust funds than public universities. However, the margin of revenue contributed by endowment trust funds shows inadequacy in supplementing the existing funding sources.

Long-term debt as measured by total long-term debt to total debts had a mean of 0.687 with a standard deviation of 0.247 for public universities and 0.643 with a standard deviation of 0.258 for private universities. This implied that 68.7% and 64.3% were the percentages of long-term debt borrowed by public and private universities respectively. This implied that both public and private universities had over borrowed through long-term debts. This meant that the universities had inadequate sources of income and as a result had turned into massive borrowing from external sources.

Short-term debt had an average of 0.178 with a standard deviation of 0.216 for public universities and 0.219 with a standard deviation of 0.244 for private universities. The results indicate that 17.8% and 21.9% of short-term debt in public and private universities contributed to the total revenue. This suggested that funds from short-term loans were largely used by both public and private universities in Kenya to support the recurrent expenditure, such as payment of salaries, accounts payable, daily running costs, among others. Therefore, the results show that both public and private universities had over utilized short-term borrowing since the percentage had surpassed the range (Kioko & Marlowe, 2016).

Trade credit had an average of 0.562 with a standard deviation of 0.115 for public universities and 0.293 with a standard deviation of 0.321 for private universities. This implied that 27.6% of trade credit in public universities and 29.3% of trade credit in private were utilized to finance daily running expenses. The rule of thumb is that trade credit should not exceed 15% of total debts used in a specified period of time (Kioko & Marlowe, 2016). The results revealed that both public and private universities had utilized more than the recommended range to cater for cash flow purposes. However, the results confirm that trade credit contributes to the operations in the universities by freeing up cash flow for a specified period of time.

The size of the university was measured by the number of students. The results indicate that the size of public universities had an average of 40193 with a standard deviation of 15015 and 13971.5 with a standard deviation of 645 for private universities. This implied that public universities were slotted more students than private universities, which meant that public universities were allocated a higher percentage of fees income compared to private universities.

The results also indicate that academic programmes as measured by number of programmes had an average of 457.5with a standard deviation of 130 for public universities and 21 with a standard deviation of 9 for private universities. This shows that public universities had more academic programmes than private universities. Since the number of academic programmes is associated with a wide range of clientele which attracts more revenue in form of fees, therefore, public universities collect more revenue from fees but the cost of offering the academic services determine the sufficiency.

Recurrent and capital expenditure was expressed as the percentage of total expenditure incurred. The results indicated that the recurrent expenditure of public universities had a mean of 0.823 with a standard deviation of 0.524. Private universities had a mean of 0.528 with a standard deviation of 0.161. Capital expenditure for public universities had an average of 0.177 with standard deviation of 0.112. Private universities had a mean of 0.172 with a standard deviation of 0.190. This meant that 82.3% and 17.7% of recurrent expenditure and capital expenditure were used in public universities respectively. Similarly, private universities had utilized 52.8% and 17.2% of recurrent expenditure and capital expenditure respectively. The results implied that both public and private universities spent more recurrent expenditure than capital expenditure.

4.4 Correlation Analysis

The correlation analysis of the study variables is presented as follows:

4.4.1 Correlation between Revenue Streams and Financial Sustainability

Correlation analysis was carried out between revenue streams and financial sustainability as measured by current ratio and financial liability ratio.

4.4.1.1 Correlation between Revenue Streams and Current Ratio

Table 4.4 and 4.5 presents the correlation results for public and private universities respectively.

Table 4. 4: Correlation Matrix for Public Universities

Indicator	Current ratio	Government grant	Student fees	Other revenue	Endowment trust fund
Current ratio	1.00				

Government	0.476**	1.00			
grant	0.000	-----			
Student fees	0.295**	0.240**	1.00		
	0.000	0.019	-----		
Other revenue	0.094	-0.111	0.179**	1.00	
	0.201	0.128	0.014	-----	
Endowment trust	0.017	-0.337**	-0.033**	-0.224	1.00
funds	0.104	0.000	0.041	0.242	-----

**Correlation is significant at the 0.05 level (2-tailed).

Table 4.5: Correlation Matrix for Private Universities

Indicator	Current ratio	Student fees	Endowment trust funds	Other revenue
Current ratio	1.00			

Student fees	0.675**	1.00		
	0.000	-----		
Endowment	0.207**	0.546**	1.00	
trust funds	0.009	0.035	-----	
Other	0.118**	0.325	0.251	1.00
revenue	0.031	0.369	0.927	-----

**Correlation is significant at the 0.05 level (2-tailed).

The results in Table 4.4 indicate that the correlation between government grant and current ratio was positive and significant ($r = 0.476$, $p < 0.05$). This meant that an increase in government grant could lead to an increase in current ratio as a measure of financial sustainability. The correlation between current ratio and student fees was positive and significant ($r = 0.295$, $p < 0.05$). This implied that increasing revenue from fees increases current ratio. The correlation results between the current ratio and the endowment trust funds was positive and insignificant ($r = 0.094$, $p > 0.05$).

Similarly, the correlation between other revenue and current ratio was positive and not significant ($r = 0.017$, $p > 0.05$).

The results depict that all the four revenue streams have positive relationship with financial sustainability of public universities of Kenya and a significant contribution except for endowment trust funds and other revenue. The results in Table 4.5 indicate that the correlation between current ratio and student fees was positive and significant ($r = 0.675$, $p < 0.05$). This implied that increasing revenue from fees increases current ratio. The correlation results between the current ratio and the endowment trust funds was positive and significant ($r = 0.207$, $p < 0.05$). This meant that an increase in endowment trust funds leads to increase in current ratio. Similarly, the correlation between other revenue and current ratio was positive and significant ($r = 0.118$, $p < 0.05$), implying that increasing other revenue increases current ratio as a measure of financial sustainability. The results further meant that all the revenue streams had positive relationship with financial sustainability and a considerable contribution.

4.4.1.2 Correlation between Revenue Streams and Financial Liability Ratio

Table 4.6 and 4.7 presents correlation results for public and private universities respectively.

Table 4. 6: Correlation Matrix for Public Universities

Indicator	FLR	GG	SF	ETF	OR
Financial Liability ratio (FLR)	1.00 -----				
Government grant (GG)	0.469** 0.000	1.00 -----			
Student fees (SF)	0.397** 0.000	0.216** 0.015	1.00 -----		
Endowment trust funds (ETF)	0.143** 0.038	0.606 0.525	0.157** 0.025	1.00 -----	
Other revenue (OR)	0.359** 0.021	0.514 0.452	0.395 0.1118	0.016 0.248	1.00 -----

**Correlation is significant at the 0.05 level (2-tailed).

Table 4. 7: Correlation Matrix for Private Universities

Indicator	FLR	SF	ETF	OR
Financial Liability ratio	1.00 -----			
Student fees	0.556** 0.029	1.00 -----		
Endowment trust funds	0.234** 0.041	0.463** 0.041	1.00 -----	
Other revenue	0.283** 0.011	0.257 0.695	0.511 0.216	1.00 -----

**Correlation is significant at the 0.05 level (2-tailed).

The results in Table 4.6 indicate that the correlation between government grant and financial liability ratio was positive and significant ($r = 0.\ 469$, $p < 0.05$). This implied that an increase in government grant leads to an increase in revenue and in return decreases financial liabilities thus boosting financial sustainability. The correlation between financial liability ratio and student fees was positive and significant ($r = 0.\ 397$, $p < 0.05$). This implied that increasing revenue from fees increases revenue and decreases financial liabilities. The correlation results between the financial liability ratio and the endowment trust funds was positive and significant ($r = 0.207$, $p < 0.05$). This meant that an increase in endowment trust funds leads to an increase in revenue earned thereby reducing financial liabilities. Similarly, the correlation between other revenue and current ratio was positive and significant ($r = 0.119$, $p < 0.05$), implying that increasing other revenue leads to an increase in total revenue thereby decreasing total financial liabilities.

Table 4.7 indicates that the correlation between financial liability ratio and student fees was positive and significant ($r = 0.\ 0.556$, $p < 0.05$). This implied that increasing revenue from fees increases total revenue and decreases financial liabilities. The correlation results between the financial liability ratio and the endowment trust funds was positive and significant ($r = 0.234$, $p < 0.05$). This meant that an increase in endowment trust funds leads to an increase in revenue earned thereby reducing financial liabilities. Similarly, the correlation between other revenue and current ratio was positive and significant ($r = 0.283$, $p < 0.05$), implying that increasing other revenue leads to decrease in financial liabilities thus enhancing financial sustainability.

4.4.2 Correlation between Debt Financing and Financial Sustainability

Correlation analysis was carried out between debt financing and financial sustainability as measured by current ratio and financial liability ratio.

4.4.2.1 Correlation between Debt Financing and Current Ratio

Table 4.8 and 4.9 presents the correlation results for public and private universities respectively.

Table 4.8: Correlation Matrix for Public Universities

Indicator	Current ratio	Long-term debt	Short-term debt	Trade credit
Current ratio	1.00			

Long-term debt	-0.002	1.00		
	0.442	-----		
Short-term debt	0.129**	0.646	1.00	
	0.024	0.513	-----	
Trade credit	0.118**	0.002	0.007**	1.00
	0.001	0.653	0.029	-----

**Correlation is significant at the 0.05 level (2-tailed).

Table 4.9: Correlation Matrix for Private Universities

Indicator	Current ratio	Long-term debt	Short-term debt	Trade credit
Current ratio	1.00			

Long-term debt	-0.009	1.00		
	0.456	-----		
Short-term debt	0.253**	0.494	1.00	
	0.033	0.383	-----	
Trade credit	0.185**	0.007	0.016	1.00
	0.038	0.536	0.515	-----

**Correlation is significant at the 0.05 level (2-tailed).

The results in Table 4.8 indicates that the correlation between current ratio and long-term debt was negative and insignificant ($r = -0.002$, $p > 0.05$). The correlation results between the short-term debt and current ratio was positive and significant ($r = 0.129$, $p < 0.05$). This meant that an increase in short-term debt leads to an increase in current ratio.

The correlation between trade credit and current ratio was positive and significant ($r = 0.118$, $p < 0.05$), implying that increasing trade credit increases current ratio as a measure of financial sustainability. This meant that short-term debt and trade credit contribute to the financial sustainability of universities in Kenya, while long-term debt do not directly contribute to cash flow purposes.

Table 4.9 indicates that the correlation between current ratio and long-term debt was negative and insignificant ($r = -0.009$, $p > 0.05$). The correlation results between the short-term debt and current ratio was positive and significant ($r = 0.253$, $p < 0.05$). This meant that an increase in short-term debt leads to an increase in current ratio. The correlation between trade credit and current ratio was positive and significant ($r = 0.185$, $p < 0.05$), implying that increasing trade credit increases current ratio as a measure of financial sustainability. This meant that short-term debt and trade credit contribute to the financial sustainability of universities in Kenya by supporting daily activities, while long-term debt does not contribute to current ratio since the funds are meant for development and not cash flow purposes.

4.4.2.2 Correlation between Debt Financing and Financial Liability Ratio

Table 4.10 and 4.11 presents the correlation results for public and private universities respectively.

Table 4.10: Correlation Matrix for Public Universities

Indicator	Financial liability ratio	Long-term debt	Short-term debt	Trade credit
Financial Liability ratio	1.00 -----			
Long-term debt	-0.322** 0.014	1.00 -----		
Short-term debt	-0.111** 0.041	0.633 0.089	1.00 -----	
Trade credit	-0.011** 0.029	0.537 0.493	0.642 0.345	1.00 -----

**Correlation is significant at the 0.05 level (2-tailed).

Table 4.11: Correlation Matrix for Private Universities

Indicator	Financial liability ratio	Long-term debt	Short-term debt	Trade credit
Financial Liability ratio	1.00 -----			
Long-term debt	-0.546** 0.000	1.00 -----		
Short-term debt	-0.214** 0.003	0.785 0.156	1.00 -----	
Trade credit	-0.018** 0.035	0.473 0.288	0.467 0.491	1.00 -----

**Correlation is significant at the 0.05 level (2-tailed).

The results in Table 4.10 indicate that the correlation between financial liability ratio and long-term debt was negative and significant ($r = -0.322$, $p < 0.05$). This implied that a decrease in long term debt could results to a decrease in total liabilities leading to an increase in financial sustainability. The correlation results between the financial liability ratio and the short-term debt was negative and significant ($r = -0.111$, $p < 0.05$). This meant that a decrease in short-term debt leads to a decrease in total liabilities thus resulting to an increase in financial sustainability. The correlation between trade credit and financial liability ratio was also negative and significant ($r = -0.011$, $p < 0.05$), implying that decreasing trade credit decreases total liabilities hence enhancing financial sustainability. Similarly, the results in Table 4.11 indicate that the correlation between long-term debt, short-term debt, trade credit and financial liability ratio were all negative and significant. This implied that a decrease in long term debt, short-term debt and trade credit could result to a decrease in total liabilities leading to savings in revenue thus a boost to the financial sustainability. The results meant that if the universities borrowed less funds, it implied that they had sufficient funds to support their operations and vice versa.

4.4.3 Correlation between Financing Options and Financial Sustainability

Correlation analysis was carried out between financing options and financial sustainability as measured by current ratio and financial liability ratio.

4.4.3.1 Correlation between Financing Options and Current Ratio

Table 4.12 and 4.13 presents the correlation results for public and private universities respectively.

Table 4.12: Correlation Matrix for Public Universities

Indicator	CR	GG	SF	ETF	OR	LTD	STD	TC
Current ratio (CR)	1.00							

Government grant	0.458**	1.00						
(GG)	0.000	-----						
Student fees	0.381**	0.29**	1.00					
(SF)	0.000	0.015	-----					
Endowment trust	0.102**	0.012	0.41**	1.00				
funds	0.034	0.217	0.018	-----				
Other revenue	0.155**	0.223	0.232	0.392	1.00			
(OR)	0.026	0.116	0.133	0.447	-----			
Long-term debt	-0.186	0.006	0.511	-0.384	-0.29**	1.00		
(LTD)	0.544	0.543	0.789	0.160	0.039	-----		
Short-term debt	0.175**	0.001	-0.003	-0.009	-0.012	-0.088	1.00	
(STD)	0.021	0.325	0.246	0.201	0.340	0.330	-----	
Trade credit	0.013**	0.009	-0.724	-0.001	-0.12**	-0.005	-0.168	1.00
(TC)	0.020	0.664	0.494	0.987	0.043	0.834	0.146	-----

**Correlation is significant at the 0.05 level (2-tailed).

Table 4.13: Correlation Matrix for Private Universities

Indicator	CR	SF	ETF	OR	LTD	STD	TC
Current ratio (CR)	1.00						

Student fees	0.635**	1.00					
(SF)	0.001	-----					
Endowment trust	0.398**	0.468**	1.00				
funds(ETF)	0.039	0.025	-----				
Other revenue	0.099**	0.325	0.293	1.00			
(OR)	0.044	0.316	0.550	-----			
Long-term debt	-0.294	0.383	-0.297	-0.329**	1.00		
(LTD)	0.627	0.296	0.865	0.028	-----		
Short-term debt	0.001**	-0.453	-0.001	-0.000	0.099	1.00	
(STD)	0.038	0.467	0.286	0.423	0.470	-----	
Trade credit	0.011**	-0.007	-0.007	-0.210	0.069	0.108	1.00
(TC)	0.039	0.294	0.103	0.189	0.130	0.211	-----

**Correlation is significant at the 0.05 level (2-tailed).

The results in Table 4.12 indicates that government grant correlation was positive and significant ($r = 0.458$, $p < 0.05$). This meant that public universities received 48.5% of government funds, while private universities did not receive any grant but capitation from the government in form of fees. Tables 4.12 and 4.13 indicate that the correlation between current ratio and student fees was positive and significant ($r = 0.381$, $p < 0.05$) for public universities and ($r = 0.635$, $p < 0.05$) for private universities. This implied that increasing revenue from fees increases current ratio. The results also confirm that private universities supported more of their operations with revenue from student fees, while public universities relied more on government funds. The correlation results between the current ratio and the endowment trust funds was positive and significant ($r = 0.102$, $p < 0.05$) for public universities and ($r = 0.398$, $p < 0.05$) for private universities. This meant that an increase in endowment trust funds leads to an increase in current ratio. Similarly, the correlation between other revenue and current ratio was positive and significant ($r = 0.155$, $p < 0.05$) for public universities and ($r = 0.099$, $p < 0.05$) for private universities, implying that increasing other revenue increases current ratio as a measure of financial sustainability.

However, the correlation between current ratio and long-term debt was negative and insignificant ($r = -0.294$, $p > 0.05$) for public universities and ($r = -0.186$, $p > 0.05$) for private universities. The correlation results between the short-term debt and current ratio was positive and significant ($r = 0.175$, $p < 0.05$) for public universities and ($r = 0.001$, $p < 0.05$) for private universities. This meant that an increase in short-term debt leads to increase in current ratio. The correlation between trade credit and current ratio was positive and significant ($r = 0.011$, $p < 0.05$) for public universities and ($r = 0.013$, $p < 0.05$) for private universities, implying that increasing trade credit increases current ratio as a measure of financial sustainability. The results show that funds from revenue streams and debt financing directly contributed to the liquidity levels of universities in Kenya.

4.4.3.2 Correlation between Financing Options and Financial Liability Ratio

Table 4.14 and 4.15 presents the correlation results for public and private universities respectively.

Table 4.14: Correlation Matrix for Public Universities

Indicator	FLR	GG	SF	ETF	OR	LTD	STD	TC
Financial liability ratio	1.00 -----							
Government grant (GG)	0.411** 0.000	1.00 -----						
Student fees (SF)	0.472** 0.000	0.285** 0.020	1.00 -----					
Endowment trust funds	0.012 0.213	0.119 0.200	0.445** 0.049	1.00 -----				
Other revenue	0.128** 0.040	0.365** 0.025	0.373 0.121	0.086 0.114	1.00 -----			
Long-term debt	-0.469** 0.022	-0.011 0.533	0.329 0.147	-0.034 0.702	-0.26** 0.030	1.00 -----		
Short-term debt	-0.196** 0.035	-0.155 0.874	-0.005 0.478	-0.008 0.287	-0.002 0.116	-0.008 0.396	1.00 -----	
Trade credit (TC)	-0.113** 0.017	0.004 0.389	-0.135 0.192	-0.018 0.182	-0.169 0.057	-0.001 0.422	-0.246 0.228	1.00 --

**Correlation is significant at the 0.05 level (2-tailed).

Table 4.15: Correlation Matrix for Private Universities

Indicator	FLR	SF	ETF	OR	LTD	STD	TC
Financial liability ratio (FLR)	1.00 -----						
Student fees (SF)	0.501** 0.021	1.00 -----					
Endowment trust funds (ETF)	0.009 0.148	0.314 0.201	1.00 -----				
Other revenue (OR)	0.156** 0.034	0.273 0.146	0.189 0.259	1.00 -----			
Long-term debt (LTD)	-0.294** 0.032	0.298 0.096	-0.007 0.511	-0.260** 0.037	1.00 -----		
Short-term debt (STD)	-0.245** 0.036	-0.243 0.634	-0.091 0.325	-0.008 0.216	-0.005 0.348	1.00 -----	
Trade credit (TC)	-0.100** 0.033	-0.157 0.699	-0.004 0.771	-0.065** 0.035	-0.002 0.347	-0.022 0.426	1.00 -----

**Correlation is significant at the 0.05 level (2-tailed).

The results in Table 4.14 indicate that the correlation between government grant and financial liability ratio was positive and significant ($r = 0.411$, $p < 0.05$). This meant that increasing government grant leads to an increase in revenue resulting to less borrowing of funds for operation which enhances financial sustainability. Tables 4.14 and 4.15 show that the correlation between financial liability ratio and student fees was positive and significant ($r = 0.472$, $p < 0.05$) for public universities and ($r = 0.501$, $p < 0.05$) for private universities. This implied that increasing revenue from fees increases total revenue and decreases financial liabilities. The correlation results between the financial liability ratio and the endowment trust funds was positive and insignificant ($r = 0.012$, $p > 0.05$) for public universities and ($r = 0.009$, $p > 0.05$) for private universities. Further, the correlation between other revenue and current ratio was positive and significant ($r = 0.128$, $p < 0.05$) for public universities and ($r = 0.156$, $p < 0.05$) for private universities, implying that an increase in other revenue leads to an increase in total revenue thereby decreasing financial liability ratio as a measure of financial sustainability.

The correlation between financial liability ratio and long-term debt was negative and significant ($r = -0.469$, $p < 0.05$) for public universities and ($r = -0.294$, $p < 0.05$) for private universities. The correlation results between the financial liability ratio and the short-term debt was negative and significant ($r = -0.196$, $p < 0.05$) for public universities and ($r = 0.245$, $p < 0.036$) for private universities. The correlation between trade credit and financial liability ratio was negative and significant ($r = -0.113$, $p < 0.05$) for public universities and ($r = -0.100$, $p < 0.05$) for private universities. This meant that a decrease in long-term debt, short-term debt and trade credit leads to a decrease in total liabilities, thus enhancing financial sustainability. The results further implied that when revenue from various streams and the borrowed funds increases, total revenue increases and universities are able to meet their obligations. However, when universities borrow more funds, it means there are not able to sustain their operations and vice versa.

4.4.4 Correlation between Financing Options, Institutional Characteristics and Financial Sustainability

The correlation results of moderator variable between independent variables and dependent variable.

4.4.4.1 Correlation of financing options, institutional characteristics on current ratio

Table 4.16 and 4.17 presents the correlation results for public and private universities respectively

Table 4.16: Correlation Matrix for Public Universities

Indicator	CR	GG	SF	ETF	OR	LTD	STD	TC	SIZE	AP
Current ratio (CR)	1.00									

Government grant	0.436**	1.00								
	0.000	-----								
Student fees	0.659**	0.011	1.00							
(SF)	0.000	0.145	-----							
Endowment trust	0.077	0.007	0.076	1.00						
funds (**ETF)**	0.106	0.248	0.490	-----						
Other revenue	0.224**	0.398	0.220	0.004	1.00					
(OR)	0.000	0.157	0.111	0.548	-----					
Long-term debt	-0.111	-0.378	0.011	-0.098	-0.408	1.00				
(LTD)	0.434	0.108	0.199	0.758	0.170	-----				
Short-term debt	0.100**	0.159	-0.025	-0.016	0.090	-0.022	1.00			
(**STD)**	0.036	0.137	0.182	0.135	0.233	0.176	-----			
Trade credit	0.011**	0.116	-0.024	-0.009	-0.04**	-0.005	-0.010	1.00		
(TC)	0.039	0.207	0.380	0.407	0.018	0.153	0.341	-----		
University size	0.681**	0.158	0.487	0.089	0.014	-0.260	-0.009	-0.190	1.00	
(**SIZE**)	0.000	0.102	0.222	0.143	0.321	0.398	0.185	0.376	-----	
Academic	0.475**	0.67**	0.118**	0.036	0.111	-0.487	-0.589	-0.243	0.439	1.00
programmes (**AP**)	0.000	0.056	0.048	0.421	0.213	0.109	0.064	0.327	0.115	----

**Correlation is significant at the 0.05 level (2-tailed).

Table 4.17: Correlation Matrix for Private Universities

Indicator	**CR**	**SF**	**ETF**	**OR**	**LTD**	**STD**	**TC**	**SIZE**	**AP**
Current ratio **(CR**)	1.00								

Student fees	0.480**	1.00							
(SF)	0.000	-----							
Endowment trust	0.013	0.008	1.00						
funds **(ETF)**	0.126	0.347	-----						
Other revenue	0.186**	0.114	0.009	1.00					
(OR)	0.000	0.233	0.458	-----					
Long-term debt	-0.144	0.008	-0.012	-0.146	1.00				
(LTD)	0.258	0.111	0.226	0.320	-----				
Short-term debt	0.139**	-0.012	-0.001	-0.002	-0.013	1.00			
(**STD)**	0.028	0.114	0.428	0.119	0.441	-----			
Trade credit	0.008**	-0.007	-0.015	-0.065**	-0.014	-0.007	1.00		
(TC)	0.042	0.782	0.331	0.011	0.371	0.267	-----		
University size	0.394**	0.549**	0.06**	0.008	-0.183	-0.02**	-0.100	1.00	
(**SIZE**)	0.000	0.000	0.025	0.561	0.400	0.017	0.310	-----	
Academic	0.450**	0.513**	0.015	0.033**	-0.289	-0.35**	-0.48**	0.656	1.00
programmes (**AP**)	0.000	0.000	0.771	0.035	0.347	0.026	0.02	0.03	---

**Correlation is significant at the 0.05 level (2-tailed).

Correlation results in Table 4.16 and 4.17 indicate that government grant, student fees, other revenue, endowment trust funds, short-term debt and trade credit were positively and significantly correlated with the current ratio when moderated by institutional characteristics, except for long-term debt. This suggested that increasing government grant, student fees, other revenue, endowment trust funds, short-term debt and trade credit leads to an increase in current ratio. The results reveal that when all these financing sources increase, more revenue will be available to meet the current obligations. The results further show a positive and significant relationship between size of university and current ratio ($r = 0.681$, $p < 0.05$) for public and ($r = 0.394$, $p < 0.05$) for private universities. This implied that an increase in size of university as measured by the number of students could lead to an increase in current ratio. This meant that an increase in the number of students brings in more revenue in form of fees thus increasing total revenue and enhancing financial sustainability. The correlation between the number of academic programmes and current ratio was ($r = 0.475$, $p < 0.05$) for public and ($r = 0.450$, $p < 0.05$) for private universities, implying that an increase in the number of academic programmes leads to an increase in revenue and in return improves liquidity position. This means that an increase in the number of academic programmes attracts more clients who bring in more revenue leading to a positive contribution to financial sustainability.

4.4.4.2 Correlation between Financing Options, institutional characteristics and Financial Liability Ratio

Table 4.18 and 4.19 presents the correlation results for public and private universities respectively.

Table 4.18: Correlation Matrix for Public Universities

Indicator	FLR	GG	SF	ETF	OR	LTD	STD	TC	SIZE	AP
Financial liability ratio (FLR)	1.00 -----									
Government grant	0.442** 0.000	1.00 -----								
Student fees (SF)	0.714** 0.000	0.34** 0.027	1.00 -----							
Endowment trust funds	0.016 0.371	0.005 0.658	0.069 0.132	1.00 -----						
Other revenue (OR)	0.228** 0.031	0.110 0.437	0.006 0.255	0.014 0.532	1.00 -----					
Long-term debt	-0.362** 0.000	0.169 0.675	0.053 0.191	-0.001 0.311	-0.08** 0.048	1.00 -----				
Short-term debt	-0.219** 0.021	0.006 0.622	-0.099 0.431	-0.068 0.200	-0.184 0.237	-0.028 0.401	1.00 -----			
Trade credit (TC)	-0.106** 0.034	0.003 0.785	-0.039 0.476	-0.021 0.299	-0.080 0.361	-0.01 0.218	-0.056 0.174	1.00 -----		
University size (SIZE)	0.567** 0.000	0.490 0.025	0.398 0.042	0.06** 0.023	0.217** 0.040	-0.13** 0.038	-0.38** 0.000	-0.174 0.267	1.00 --	
Academic programmes	0.33** 0.000	0.089 0.121	0.51** 0.000	0.059 0.077	0.011 0.316	-0.263 0.400	-0.28** 0.012	-0.310 0.022	0.33 0.10	1.00 -----

**Correlation is significant at the 0.05 level (2-tailed).

Table 4.19: Correlation Matrix for Private Universities

Indicator	FLR	SF	ETF	OR	LTD	STD	TC	SIZE	AP
Financial liability ratio **(FLR)**	1.00 -----								
Student fees **(SF)**	0.611** 0.000	1.00 -----							
Endowment trust funds **(ETF)**	0.002 0.636	0.019 0.413	1.00 -----						
Other revenue **(OR)**	0.213** 0.000	0.036 0.421	0.004 0.387	1.00 -----					
Long-term debt **(LTD)**	-0.144** 0.008	0.079 0.221	-0.008 0.132	-0.01** 0.032	1.00 -----				
Short-term debt (**STD)**	-0.26** 0.016	-0.038 0.154	-0.001 0.225	-0.067 0.324	-0.001 0.340	1.00 -----			
Trade credit **(TC)**	-0.18** 0.042	-0.014 0.334	-0.005 0.613	-0.073 0.200	-0.098 0.322	-0.011 0.288	1.00 -----		
University size (**SIZE)**	0.539** 0.000	0.46** 0.000	0.08** 0.032	0.23** 0.020	-0.183 0.021	-0.4** 0.000	0.2** 0.01	1.00 -----	
Academic programmes **(AP)**	0.381** 0.000	0.59** 0.000	0.09** 0.048	0.003 0.377	-0.211 0.437	-0.262 0.018	-0.3** 0.039	0.279 0.041	1.00 --

**Correlation is significant at the 0.05 level (2-tailed).

The results in Table 4.18 indicate that the correlation of government grant and financial liability ratio was positive and significant. Table 4.18 and 4.19 show the correlation between student fees, other revenues and financial liability ratio was also positive and significant except for endowment trust funds. This meant that an increase in government grant, student fees and other revenue leads to an increase in total revenue which is used for settling debts and supporting overall operations in universities. In addition, the study established hat when revenue increases, it minimizes borrowing signifying that there are sufficient funds to support university operations.

The correlation between financial liability ratio and long-term debt, short-term debt and trade credit was negative and significant for both public and private universities. This implies that a decrease in debts leads to a decrease in total liabilities thus increasing financial sustainability. The results further show a positive and significant relationship between size of university and financial liability ratio ($r = 0.567$, $p < 0.05$) for public and ($r = 0.539$, $p < 0.05$) for private universities. This meant that an increase in size of university as measured by the number of students could lead to an increase in total revenue and in return a decrease in financial liability ratio.

The correlation between number of academic programmes and current ratio was ($r = 0.336$, $p < 0.05$) for public and ($r = 0.381$, $p < 0.05$) for private universities, implying that an increase in the number of academic programmes leads to an increase in revenue received thus a decrease in financial liability ratio. The results further implied that when academic programmes are increased, they attract more students who bring in revenue to support the operations and lessen external debts.

4.4.5 Correlation between Financing Options, Funds Utilization and Financial Sustainability

The correlation analysis was also done for mediator variable, the independent variable and the dependent variable.

4.4.5.1 Correlation between Financing Options, Funds utilization and Current Ratio

Table 4.20 and 4.21 presents the correlation results for public and private universities respectively.

Table 4.20: Correlation Matrix for Public Universities

Indicator	**CR**	**GG**	**SF**	**ETF**	**OR**	**LTD**	**STD**	**TC**	**RE**	**CE**
Current ratio **(CR)**	1.00									

Government	0.621**	1.00								
Grant (**GG**)	0.000	-----								
Student fees **(SF)**	0.665**	0.564**	1.00							
	0.000	0.013	-----							
Endowment trust	0.076	0.007	0.034	1.00						
funds **(ETF)**	0.212	0.816	0.387	-----						
Other revenue	0.499**	0.243	0.109	0.011	1.00					
(OR)	0.000	0.421	0.542	0.478	-----					
Long-term debt	-0.379	0.006	0.065	-0.004	-0.015**	1.00				
(LTD)	0.653	0.254	0.164	0.433	0.039	-----				
Short-term debt	0.059**	0.023	-0.001	-0.017	-0.012**	-0.002	1.00			
(**STD)**	0.024	0.169	0.187	0.470	0.029	0.364	-----			
Trade credit	0.068**	0.001	-0.015	-0.008	-0.110**	-0.027	-0.009	1.00		
(TC)	0.031	0.333	0.432	0.489	0.037	0.655	0.244	-----		
Recurrent	-0.692**	0.557**	0.120	0.282	-0.003**	-0.180	0.004	0.163	1.00	
expenditure **(RE)**	0.000	0.021	0.059	0.535	0.017	0.610	0.265	0.487	-----	
Capital expenditure	-0.029	0.438**	0.046	0.232	0.121**	-0.4**	-0.07**	-0.127	0.105	1.00
(CE)	0.386	0.035	0.323	0.543	0.034	0.009	0.028	0.207	0.03	---

**Correlation is significant at the 0.05 level (2-tailed).

Table 4. 21: Correlation Matrix for Private Universities

Indicator	**CR**	**SF**	**ETF**	**OR**	**LTD**	**STD**	**TC**	**RE**	**CE**
Current ratio (CR)	1.00								

Student fees	0.698**	1.00							
(SF)	0.000	-----							
Endowment trust	0.055	0.022	1.00						
funds **(ETF)**	0.298	0.453	-----						
Other revenue	0.462**	0.114	0.071	1.00					
(OR)	0.000	0.787	0.955	-----					
Long-term debt	-0.233	0.093	-0.036	-0.005**	1.00				
(LTD)	0.300	0.425	0.587	0.004	-----				
Short-term debt	0.025**	-0.031	-0.085	-0.015**	-0.009	1.00			
(**STD)**	0.033	0.214	0.602	0.034	0.624	-----			
Trade credit	0.053**	-0.007	-0.015	-0.116**	-0.014	-0.002	1.00		
(TC)	0.044	0.327	0.331	0.036	0.489	0.258	-----		
Recurrent	-0.672**	0.128	0.284	-0.008**	-0.183	0.006	0.166	1.00	
expenditure **(RE)**	0.000	0.056	0.535	0.011	0.680	0.247	0.421	-----	
Capital expenditure	-0.035	0.008	0.243	0.147**	-0.4**	-0.037**	-0.101	0.05**	1.00
(CE)	0.582	0.348	0.239	0.023	0.000	0.026	0.259*	0.033	-----

**Correlation is significant at the 0.052level (2-tailed).

Correlation results in Table 4.20 and 4.21 indicate that the relationship between current ratio and government grant, student fees, other revenue and endowment trust funds was positive and significant for both public and private universities. This implied that increasing revenue from the four revenue streams increased current ratio as a measure of financial sustainability. The correlation between the short-term debt and current ratio was positive and significant ($r = 0.059$, $p < 0.05$) for public and ($r = 0.025$, $p < 0.05$) for private universities. This meant that an increase in short-term debt led to increase in the current ratio. The correlation between trade credit and current ratio was positive and significant ($r = 0.068$, $p < 0.05$) for public and ($r = 0.053$, $p < 0.05$) for private universities, implying that increasing trade credit increases current ratio as a measure of financial sustainability. However, the correlation between current ratio and long-term debt was negative and insignificant ($r = -0.233$, $p > 0.05$). The results further showed a negative and significant relationship between recurrent expenditure and current ratio ($r = -0.694$, $p < 0.05$) for public and ($r = -0.672$, $p < 0.05$) for private universities. This implied that a decrease in recurrent expenditure could lead to an increase in current ratio. The correlation between capital expenditure and current ratio was negative and insignificant ($r = -0.025$, $p > 0.05$) for public and ($r = -0.035$, $p > 0.05$) for private universities. Recurrent expenditure mediates funds from various sources in that when the expenses are reduced, it leads to savings on finances and the revenue is availed to meet all the obligations.

4.4.5.1 Correlation between Financing Options, FU and Financial Liability Ratio

Table 4.22 and 4.23 presents the correlation results for public and private universities respectively.

Table 4.22: Correlation Matrix for Public Universities

Indicator	FLR	GG	SF	ETF	OR	LTD	STD	TC	RE	CE
Financial liability ratio **(FLR)**	1.00 -----									
Government grant **(GG)**	0.464** 0.013	1.00 -----								
Student fees **(SF)**	0.563** 0.000	0.65** 0.000	1.00 -----							
Endowment trust funds **(ETF)**	0.133** 0.032	0.008 0.345	0.003 0.112	1.00 -----						
Other revenue **(OR)**	0.232** 0.000	0.097 0.246	0.165 0.387	0.090 0.211	1.00 -----					
Long-term debt **(LTD)**	-0.507** 0.000	0.008 0.566	0.104 0.271	-0.176 0.129	-0.186 0.312	1.00 -----				
Short-term debt (**STD)**	-0.376** 0.000	0.004 0.433	-0.112 0.213	-0.089 0.122	-0.029 0.113	-0.006 0.798	1.00 -----			
Trade credit **(TC)**	-0.143** 0.037	0.014 0.320	-0.113 0.271	-0.065 0.187	-0.088 0.162	-0.110 0.145	-0.246 0.100	1.00 -----		
Recurrent expenditure **(RE)**	-0.410** 0.000	0.59** 0.033	0.30** 0.011	0.05** 0.035	0.06** 0.017	-0.3** 0.043	-0.3** 0.000	-.20** 0.006	1.00 -----	
Capital Expenditure **(CE)**	-0.198** 0.028	0.436 0.017	0.452 0.00**	0.073 0.167	0.276 0.339	-0.176 0.340	-0.2** 0.016	-0.119 0.187	0.239 0.130	1.00 --

**Correlation is significant at the 0.05 level (2-tailed).

Table 4.23: Correlation Matrix for Private Universities

Indicator	FLR	SF	ETF	OR	LTD	STD	TC	RE	CE
Financial liability ratio **(FLR)**	1.00 -----								
Student fees **(SF)**	0.662** 0.000	1.00 -----							
Endowment trust funds **(ETF)**	0.101** 0.026	0.006 0.399	1.00 -----						
Other revenue **(OR)**	0.275** 0.000	0.067 0.543	0.059 0.271	1.00 -----					
Long-term debt **(LTD)**	-0.563** 0.000	0.112 0.302	-0.054 0.132	-0.178** 0.013	1.00 -----				
Short-term debt (**STD)**	-0.346** 0.000	-0.116 0.249	-0.087 0.212	-0.005 0.134	-0.004 0.631	1.00 -----			
Trade credit **(TC)**	-0.186** 0.015	-0.014 0.230	-0.011 0.333	-0.058 0.196	-0.113 0.171	-0.235 0.186	1.00 -----		
Recurrent expenditure **(RE)**	-0.495** 0.001	0.404** 0.019	0.05** 0.042	0.066** 0.028	-0.3** 0.011	-0.392** 0.000	-0.43** 0.018	1.00 -----	
Capital Expenditure **(CE)**	-0.222** 0.015	0.541** 0.000	0.07** 0.004	0.045 0.377	-0.184 0.437	-0.29** 0.009	-0.10** 0.010	0.31** 0.030	1.00 --

**Correlation is significant at the 0.05 level (2-tailed).

The results in Tables 4.22 and 4.23 indicate that the correlation between financial liability ratio and government grant, student fees, other revenue and endowment trust funds was positive and significant for both public and private universities. This implied that increasing revenue from various streams increased total revenue which led to less borrowing of funds thus enhancing financial sustainability. The correlation between financial liability ratio and long-term debt was negative and significant ($r = -0.507$, $p < 0.05$) for public and ($r = -0.563$, $p < 0.05$) for private universities. This meant that a decrease in long-term debt led to a decrease in total labilities which in return boosted financial sustainability. On the other hand, when universities borrow less of long-term debt it signifies sufficiency of finances. The correlation results between the financial liability ratio and the short-term debt was negative and significant ($r = -0.376$, $p < 0.05$) for public and ($r = -0.346$, $p < 0.05$) for private universities. This meant that a decrease in short-term debt led to a decrease in total liabilities which increased to financial sustainability. The correlation between trade credit and financial liability ratio was negative and significant ($r = -0.143$, $p < 0.05$) for public and ($r = -0.346$, $p < 0.05$) for private universities. This implied that decreasing trade credit, increases financial sustainability. The results further show that a negative and significant relationship existed between recurrent expenditure and financial liability ratio ($r = -0.346$, $p < 0.05$) for public and ($r = -0.495$, $p < 0.05$) for private universities. This meant that a decrease in recurrent expenditure led to a savings in total revenue. The correlation between capital expenditure and financial liability ratio was ($r = -0.198$, $p < 0.05$) for public and ($r = -0.222$, $p < 0.05$) for private universities, implying that a decrease in the capital expenditure reduces expenses on capital projects which result to savings in total revenue thus enhancing financial sustainability.

4.5 Results of Hypotheses Testing

Multiple linear regression analysis was used to test the hypotheses in the study and determine the relationship between the variables. This section presents the results of the following five hypotheses that were tested.

4.5.1 Analysis of Influence of Revenue Streams on Financial Sustainability

The first objective was to determine the influence of revenue streams on the financial sustainability of universities in Kenya. The following hypothesis was thus tested using multiple linear regression model.

H_{01}**:** Revenue streams have no influence on financial sustainability of universities in Kenya.

Model

$$FS_{it} = \beta_0 + \beta_1 GG_{it} + \beta_2 SF_{it} + \beta_3 OR_{it} + \beta_4 ETF_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4.1$$

Where

FS was the financial sustainability, β0 was the regression constant, *i* was 1,2 …., 55 universities, t was 1,2 …., 6 years, $\beta_1 \ldots B_4$ were coefficients estimated, GG was government grant, SF was student fees, OR was other revenue, ETF was endowment trust funds and ε was the error term.

4.5.1.1 Diagnostic Tests

Diagnostic tests were done in order to determine the appropriate analytical model. The tests were normality, heteroscedasticity, multi-collinearity and autocorrelation. Breusch Pagan LM test and Hausman test was also carried out in order to determine whether to use pooled OLS, fixed or random-effects model.

Table 4.24 presents the test for normality.

Table 4.24: Results for Jarque-Bera Statistics test

Sector	Statistic	Prob.
Public	7.519	0.827
Private	4.679	0.553

Jarque-Bera statistic test was carried out to determine normality. The null hypothesis for this test was that the data was normally distributed while the alternative hypothesis was that the data was not normally distributed. The results indicated that the Jarque-Bera statistic in Table 4.24 were insignificant at a 5% level of significance, suggesting that the data was normally distributed. The alternative hypothesis was thus rejected and the study concluded that the data was normally distributed.

Table 4.25: Results for Heteroscedasticity -White Test

Sector	Dependent Variable	χ^2–value	p-value
Public	Financial sustainability	15.234	0.1467
Private	Financial sustainability	10.448	0.3261

The results in Table 4.25 indicate that the p-values were more than 0.05. The null hypothesis for this test was that there was no heteroscedasticity while the alternative hypothesis was that heteroscedasticity exists. The null hypothesis that there was no heteroscedasticity was thus accepted.

Table 4. 26: Variance Inflation Factor Results

	Public		Private	
Indicator	**I/VIF**	**VIF**	**I/VIF**	**VIF**
Government grant	0.089	2.145	-	-
Student fees	0.002	1.448	0.055	1.657
Other revenue	0.027	1.248	0.865	1.156
Endowment trust funds	0.004	1.037	0. 463	1.099
Mean VIF		1.469		1.304

A VIF of 1 indicates no correlation between predictors, a value of between 1 and 10 indicates a moderate correlation and a value above 10 indicates that predictor variables are highly correlated (Gujarati, 1995). The results presented in Table 4.26 indicates that the VIF values for all the variables were below 10 and the tolerance value (1/VIF) was below 1. The findings revelaed that there was no serious multi-collinearity problem.

Table 4.27: Durbin–Watson Statistics Results

Sector	R Squared	Adjusted R Squared	Std. error	Durbin-Watson
Public	0.467	0.389	0.118	1.975
Private	0.336	0.287	0.261	1.665

The Durbin Watson statistic should range between 0 and 4. The results in Table 4.27 indicate that the Durbin Watson statistics were within the range, implying that there was no autocorrelation problem.

Table 4.28: Results for Breusch-Pagan LM test

Sector	Statistic	Prob.
Public	9. 532	0.007
Private	7.339	0. 015

To determine whether pooled OLS, random-effects or fixed-effects model was appropriate, Breusch and Pagan Lagrangian multiplier test was carried out. The results in Table 4.28 indicated that the P values were less than 0.05 suggesting that pooled OLS was not appropriate. Further, Hausman test was carried out to determine whether the random or fixed-effects model was appropriate. Results are presented in Table 4.29.

Table 4.29: Hausman test Overall Results

Sector	Chi-Sq. Statistic	Chi-Sq. d.f	Prob.
Public	8.416	4	0.093
Private	6.876	3	0.168

The results in Table 4.29 show that the p-values were greater than 0.05 suggesting that the random effects model was appropriate. The study therefore, rejected the null hypothesis and accepted the alternative hypothesis. Therefore, the study concluded that the preferred model for analysis was a random effect model rather than the fixed effect model.

4.5.1.2 Regression Results

Table 4.30 presents the results on the influence of revenue streams on financial sustainability of universities in Kenya.

Table 4.30: Revenue Streams and Financial Sustainability

Indicator	Public		Private	
	Current ratio	Financial liability ratio	Current ratio	Financial liability ratio
C	0.380	0.365	0.754	0.663
	0.000**	0.000**	0.000**	0.000**
Government	0.668	0.577	-	-
grant	0.000**	0.000**	-	-
Student fees	0.542	0.436	0.641	0.583
	0.008**	0.001**	0.027**	0.010**
Other revenue	0.330	0.218	0.464	0.325
	0.000**	0.020**	0.039**	0.038**
Endowment trust	0.129	0.160	0.271	0.185
Fund	0.044**	0.134	0.011**	0.211
R-squared	0.679	0.464	0.622	0.537
Adj. R-squared	0.564	0.388	0.515	0.460
F-statistic	10.081	11.775	12.321	10.345
Prob(F-statistic)	0.000	0.000	0.000	0.000

* indicates p-value ** indicate p-value significant at the 0.05 level.

Results in Table 4.30 indicate that current ratio had a coefficient of determination (R^2) of 0.679 for public universities and 0.622 for private universities. This meant that 67.9% and 62.2% of variations in current ratio were explained by variations in revenue streams of public and private universities respectively. The results also show that financial liability ratio was 0.464 for public universities and 0.537 for private universities. This implied that 46.4% and 53.7% of variations in financial liability ratio were explained by variations in revenue streams of public and private universities respectively. In addition, the relationship between the revenue streams and the current ratio was significant, since F = 10.080 ($p < .05$) for public and F = 12.321 ($p < .05$) for private universities. Further, the relationship between the revenue streams and the financial liability ratio was significant, since F = 11.775 ($p < .05$) and F = 10.345($p < .05$) for public and private universities respectively.

This revealed that the revenue streams variable significantly influenced the financial sustainability (current ratio and financial liability ratio) of both public and private universities in Kenya.

The null hypothesis was that revenue streams have no influence on financial sustainability of universities in Kenya. Therefore, the study rejected the null hypothesis and concluded that there exists a significant relationship between revenue streams and financial sustainability.

The results further confirm that the coefficient of government grant was positive and statistically significant. ($\beta = 0.668$, $p = 0.00$), implying that government grant had a significant influence on current ratio as a measure of financial sustainability. This implies that a 1% increase in government grant will lead to a 66.8% increase in the current ratio. The coefficients of government grant for financial liability ratio was positive and statistically significant ($\beta = 0.577$, $p = 0.000$), implying that a 1% increase in government grant leads to 57.7% increase in revenue and a decrease in financial liabilities thus resulting to enhancement in financial sustainability.

The study findings support the work of Mamo's (2015) who established that government funds positively influenced the performance of universities in sub-Saharan African countries. The study also confirms the work of Mutiso et al., (2015) who found that government capitation had a significant influence on the financial performance and standard of education in HEIs in Kenya. The findings also support the work of (Ahmed, 2015; Panigrahi, 2018; Ahmad et al., 2019).

On the other hand, student fees had a positive and statistically significant influence on financial sustainability of public universities ($\beta = 0.542$, $p = 0.008$) and private universities ($\beta = 0.641$, $p = 0.027$). This implied that student fees influence the current ratio. This implied that a 1% increase in student fees led to 54.2% and 64.1% increase in current ratio for public and private universities respectively. This is an indication that when fees received from students increases the funds to cater for daily operations also increases thereby improving financial sustainability. From the results it can be observed that revenue collected from student fees covers the cost of daily operations. The coefficients of student fees for financial liability were positive and statistically significant ($\beta = 0.436$, $p = 0.001$) for public and ($\beta = 0.583$, $p = 0.010$) for private universities. This implies that a 1% increase in student fees leads to 43.6% increase in revenue and a decrease in financial liability ratio for public and 58.3% for private universities.

The findings confirm the work of Webb (2015), who found that tuition fees significantly contribute to the daily operations of universities and colleges in USA during tough economic conditions, and Estermann (2020) who observed that fee income had a positive and significant effect on European universities. The findings are also consistent with those of Mutiso et al., (2015), who noted that tuition fees have a significant influence on the performance and quality of education in HLIs in Kenya and Lee et al. (2020) who found an increase in tuition fees increases government grant. However, the results contradict the finding of Siraj et al. (2019), who established that tuition fee was not significant to the total revenue of public universities in Malaysia.

Thirdly, the results show that the coefficients of other revenue were positive and statistically significant for both current ratio and financial liability ratio. The results imply that an increase in other revenue results to an increase in total revenue for public and private universities. Further, in respect to financial liability ratio, this means that an increase in other revenue leads to increase in total revenue which in return reduces financial liabilities. The study findings support those of Ahmed, Soon and Ting (2015), who established that income generated through commercializing services is crucial to the growth and survival of a university and Afriyie (2015), who found that internally generated income had a positive correlation with financial sustainability of institutions of higher education in Ghana. The study also confirms the work of Murage and Onyuma (2015) also established that internally generated activities are a profitable source of income to fund PHLIs.

The results also indicate that the coefficient of endowment trust funds on current ratio was 0.129 with p-value of 0.044 for public universities and 0.271 with p-value of 0.041 for private universities. This meant that a 1% increase in endowment trust funds leads to 12.9% and 27.1% increase in current ratio in public and private universities respectively. The study findings are in line with the work of Ahmed et al. (2019), who found that endowment funds are a source of revenue in PHLIs in Malaysia and (Chumba et al., 2019) who reported that harnessing endowment kitties in Kenyan universities enhanced the investment project, which increases the revenue base.

The findings are in line with the work of Divecha (2014) who noted that international funding, fundraising and corporate donor sourcing positively correlated with the financial sustainability of Kenyan NGOs. The results also confirm the works of (Chumba et al., 2020; Roy, 2016). The results also revealed that financial liability ratio had 0.160 with a p-value of 0.134 for public and 0.185 with a p-value of 0.211 for private universities. This imply that endowment trust funds are not significant to financial liability ratio as measure of financial sustainability. The findings confirm the work of (Mutinda & Ngahu, 2015; Cheboi, 2014; Thelin & Trollinger, 2019) who found donations to have insignificant results to outcome.

4.5.2 Analysis of Influence of Debt Financing and Financial Sustainability

The second objective of the study was to determine the influence of debt financing on financial sustainability of universities in Kenya. The following null hypothesis was tested.

$H0_2$: There is no influence of debt financing on financial sustainability of universities in Kenya.

The null hypothesis was tested using the following multiple linear regression model:

Model

$$FS_{it} = \beta_0 + \beta_1 LTD_{it} + \beta_2 STD_{it} + \beta_3 TC_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.6$$

Where

FS was the financial sustainability, β0 was the regression constant, *i* was 1,2 …., 55 universities, t was 1,2 …., 6 years, $\beta_1 \ldots B_3$ were coefficients estimated, LTD was long-term debt, STD was shot-term debt, TC was trade credit and ε was the error term.

4.5.2.1 Diagnostic Tests

Diagnostic tests were done in order to determine the appropriate analytic model. The tests were normality, heteroscedasticity, multi-collinearity and autocorrelation. Breusch Pagan LM test and Hausman test was also carried out in order to determine whether to use pooled OLS, fixed or random-effects model. Table 4.31 show results for normality.

Table 4.31: Results for Jarque-Bera Statistics test

Sector	Statistic	Prob.
Public	9.846	0.573
Private	7.643	0.366

The results indicated that the Jarque-Bera statistic in Table 4.31 were insignificant at a 5% level of significance, suggesting that the data was normally distributed. The alternative hypothesis was thus rejected and the study concluded that the data was normally distributed.

The study conducted white test to investigate the presence of heteroscedasticity. The results are shown in Table 4.32.

Table 4.32: Results for Heteroscedasticity -White Test

Sector	Dependent Variable	χ^2 – value	p-value
Public	Financial sustainability	11.465	0.263
Private	Financial sustainability	9.822	0.196

The results in Table 4.32 indicate that the p-values were more than 0.05. The null hypothesis of no heteroscedasticity was thus accepted. The results for multi-collinearity are presented in tables 4.33.

Table 4.33: Variance Inflation Factor Results

	Public		Private	
Indicator	**I/VIF**	**VIF**	**I/VIF**	**VIF**
Long-term debt	0.111	1.093	0.269	1.533
Short-term debt	0.568	1.144	0.768	1.791
Trade credit	0.347	0.835	0.944	1.390
Mean VIF		1.024		1.571

The results in Table 4.33 indicates that the VIF values for all the variables are below 10 and the tolerance value (1/VIF) is below 1. The findings suggested that there was no multi-collinearity problem. The results for autocorrelation are shown in Table 4.34.

Table 4.34: Durbin–Watson Statistics Results

Sector	R Squared	Adjusted R Squared	Std. error	Durbin-Watson
Public	0.196	0.138	0.315	2.126
Private	0.147	0.123	0.130	1.924

The results in Table 4.34 indicate that the Durbin Watson statistics were within the range, implying that there was no autocorrelation problem.

The model specification test results are presented on Table 4.35

Table 4.35: Results for Breusch-Pagan LM test

Sector	Statistic	Prob.
Public	11. 116	0.038
Private	9.450	0. 009

The results in Table 4.35 indicated that the P values were less than 0.05 suggesting that pooled OLS was not appropriate. Further, Hausman test was carried out to determine whether the random or fixed-effects model was appropriate. Results are presented in Table 4.36.

Table 4.36: Hausman test Results

Sector	Chi-Sq. Statistic	Chi-Sq. d.f	Prob.
Public	11.435	3	0.177
Private	10.218	3	0.279

The results in Table 4.36 show that the p-values were greater than 0.05 suggesting that the random effects model was appropriate. This resulted to the rejection of the null hypothesis and acceptance of the alternative hypothesis.

Therefore, the study concluded that the preferred model for analysis was a random effect model rather than the fixed effect model.

4.5.2.2 Regression Results

Table 4.37 presents the results for the relationship between debt financing and financial sustainability of universities in Kenya.

Table 4.37: Debt financing and Financial Sustainability

Indicator	**Public**		**Private**	
	Current ratio	Financial liability ratio	Current ratio	Financial liability ratio
C	0.484	0.613	0.586	0.586
	0.000	0.111	0.000	0.233
Long-term debt	-0.164	-0.643	-0.412	-0.341
	0.386*	0.003**	0.248*	0.022**
Short-term debt	0.039	-0.311	0.010	- 0.110
	0.016**	0.028**	0.024**	0.037**
Trade credit	0.079	-0.457	0.149	-0.265
	0.035**	0.015**	0.037**	0.043**
R-squared	0.068	0.576	0.073	0.615
Adj. R-squared	0.031	0.434	0.043	0.614
F-statistic	11.395	10.255	10.664	11.414
Prob(F-statistic)	0.037	0.028	0.015	0.044

* indicates p-value ** indicate p-value significant at the 0.05 level

Results in Table 4.37 indicate that current ratio had a coefficient of determination (R^2) 0.068 for public universities and 0.073 for private universities. This meant that 6.8% and 7.3% of variations in current ratio were explained by variations in debt financing of public and private universities respectively. In addition, the influence of debt financing on current ratio was significant, since F = 10.395 (p =0.037) for public and F = 11.664 (p = 0.015) for private universities. The results also show that financial liability ratio was 0.576 for public universities and 0.615 for private universities. This implied that 57.6% and 61.5% of variations in financial liability ratio were explained by variations in debt financing. Further, the influence of debt financing on financial liability ratio was significant, since F = 11.255 (p = 0.028) for public and F = 11.414 (p = 0.044) for private universities.

This revealed that the debt financing variable significantly influenced the financial sustainability of universities in Kenya. The null hypothesis was that there is no influence between debt financing and financial sustainability of universities in Kenya. Therefore, the study rejected the null hypothesis and concluded that there exists a significant influence of debt financing on financial sustainability.

Table 4.37 shows the regression coefficient for the long-term debt on current ratio was -0.164 with a p-value of 0.386 for public and -0.412 with a p-value of 0.248 for private universities. The coefficients for financial liability ratio was -0.643 with a p-value of 0.003 for public universities and -0.341 with a p-value of 0.022 for private universities. This implied that a 1% decrease in long-term debt leads to 32.2% and 34.1% of financial sustainability for public and private universities respectively. This meant that when long-term debt decreases, total revenue increases contributing to sustainable operations.

The findings confirm the work of Xu, Ou and Chen (2016), who found that long-term debt had a correlated negatively and significant influence to financial performance of firms listed at the Nairobi Security Exchange. Obuya (2017) found debt utilization has an advantage because of interest on tax deducted from the income to arrive at net taxable income. In addition, its low-cost nature and planning because the interest cost is fixed and known in advance, resulting in better returns to the business. The finding also confirms the work of Kimathi (2019), who established that long-term financing had a significant influence on public universities in Kenya and Koskei (2017) who revealed that long-term debt had significant effects on financial performance of private sugar manufacturing companies in Kenya. This study finding contradicts the work of Cecchetti et al., (2011) who established that long-term debt had a positive correlation and insignificant effect on financial performance of the private manufacturing companies in Kenya and Ng'anga'a (2017) who established that overall debt financing had positive and insignificant effects on financial performance of private secondary schools in Kajiado County. Muchugia (2013) found long-term loans had insignificant effects on profitability. Other studies that found contradicted results of long-term debt on firm outcomes (Kajirwa, 2015; Saad, Ghani, Ahmed & Salim, 2015; Githaiga & Kabiru, 2015; Salim, 2015).

The coefficient of short-term debt for public universities was 0.039 with a p-value of 0.016 for public and 0.010 with a p-value of 0.024 for private universities. This implied that 1% increase in short-term debt leads to 3.9% increase in current ratio for public and 1% for private universities. This meant that when short-term debt increases the finances also increases and in return increases financial sustainability as measured by current ratio. The study findings confirm the work of Lambe (2014) who established that short-term debt had positive relationship with firm value of Nigerian Stock exchange, Dube (2013) who found that short-term debt had positive correlation with profitability of SMEs in Zimbabwe. The coefficients for financial liability ratio were -0.311 with p-value of 0.028 for public and -0.110 with p-value of 0.037 for private universities. This implied that 1% decrease in short-term debt leads to a decrease in total liabilities by 31.1% for public and 11% for private which in return enhances financial sustainability. The study confirms with the work of Makanga (2015) who established that short-term loans had a negative association with return of asset and significant and Kimathi (2019) who found that debt financing had a negative and significant effects on financial performance of public universities in Kenya. The study findings contradict the work of Ochang'a et al., (2016) who revealed that short-term debt was not significant to return on asset.

The coefficient of trade credit on current ratio for public universities was 0.079 for public and 0.149 for private universities. This implied that 1% increase in trade credit leads to 7.9% and 14.9% increase in current ratio for public and private universities. This meant that when trade credit increases finances are available for daily operations which contributes to financial sustainability. The findings confirm the work of Metto and Ombaba, (2021) who found that trade credit positively and significantly influenced financial sustainability of private secondary schools in Uasin Gishu County, Kapkiyai and Mugo (2015) who established that trade credit positively affected profit margin, return on assets and liquidity and of private schools' in Eldoret Town, Kenya and Karuma et al., (2018) who found a positive and significant relationship between accounts payable and return on assets of manufacturing firms in NSE.

The coefficients of trade credit for financial liability ratio were -0.457 with p-value of 0.015 for public and -0.265 with p-value of 0.043 for private universities.

This implied that 1% decrease in trade credit leads to 45.7% increase in total revenue for public and 26.5% for private universities. This meant that when trade credit decreases, total liabilities also decrease leading to a savings in total revenue which improves financial sustainability. The study findings confirm the work of Katiwa (2017) who found that trade credit and assets of the firm are statistically significant determinants of value of private secondary schools in Kenya. The study findings also confirm the work of Tang (2014) and Sola et al., (2020). The study findings contradict the work of Mwangangi (2013) who established an inverse insignificant relationship between trade credit and the value of firm. Other studies that have reported contradictory results of trade credit and firm returns (Hashemi, 2018; Cunat & Garcia 2012; Harash, Al-Timimi & Alsaadi, 2014; Cecchet et al., 2011).

4.5.3 Analysis of joint Influence of financing options on financial sustainability

The third objective of the study was to determine the joint influence of financing options on the financial sustainability of universities in Kenya. Financing options comprises of revenue streams and debt financing. To satisfy the third objective, the following hypothesis was tested using random effects regression model.

$H0_3$: Financing options have no joint influence on financial sustainability of universities in Kenya.

The null hypothesis was tested using the following multiple linear regression model:

$$FS_{it} = \beta_0 + \beta_1 GG_{it} + \beta_2 SF_{it} + \beta_3 OR_{it} + \beta_4 ETF_{it} + \beta_5 LTD_{it} + \beta_6 STD_{it} + \beta_7 TC_{it} + \varepsilon_{it} \quad \ldots\ldots 4.3$$

Where

FS was financial sustainability (current ratio and financial liability ratio), β_0 was a constant, β_1, β_2, β_3 …… β_7 were the Beta coefficients, GG was the government grant, SF was the student fees, IGR was the other revenue, ETF was the endowment trust funds, LTD was the long-term, STD was the short-term debt, TC was the trade credit and ε was the error term.

4.5.3.1. Diagnostic Tests

Diagnostic tests were done in order to determine the appropriate analytic model. The tests were normality, heteroscedasticity, multi-collinearity and autocorrelation.

Breusch Pagan LM test and Hausman test was also carried out in order to determine whether to use pooled OLS, fixed or random-effects model. Table 4.38 show results for normality.

Table 4.38: Results for Jarque-Bera Statistics test

Sector	Statistic	Prob.
Public	11.587	0.951
Private	8.321	0.570

The results indicated that the Jarque-Bera statistic in Table 4.38 were insignificant at a 5% level of significance, suggesting that the data was normally distributed. The alternative hypothesis was thus rejected and the study concluded that the data was normally distributed.

The results for heteroscedasticity are shown in Table 4.38.

Table 4.39: Results for Heteroscedasticity -White Test

Sector	Dependent Variable	χ^2 – value	p-value
Public	Financial sustainability	13.738	0.189
Private	Financial sustainability	10.380	0.126

The results in Table 4.39 indicate that the p-values were more than 0.05, implying no heteroscedasticity. The results for multicollinearity are presented in tables 4.40.

Table 4.40: Variance Inflation Factor Results

	Public		Private	
Indicator	**I/VIF**	**VIF**	**I/VIF**	**VIF**
Government grant	0. 876	1.745	0.850	1.376
Student fees	0.765	1.843	0.692	1.608
Endowment trust funds	0.298	1.009	0.847	1.723
Other revenue	0.432	1.066	0.940	1.488
Long-term debt	0.975	1.125	0.628	1.612
Short-term debt	0.684	1.269	0.755	1.604
Trade credit	0.473	0.924	0.895	1.431
Mean VIF		1.788		1.594

The results presented in Table 4.40 indicates that the VIF values for all the variables are below 10 and the tolerance value (1/VIF) is below 1. The findings established that there was no multi-collinearity problem.

The results for autocorrelation are shown in Table 4.41.

Table 4.41: Durbin–Watson Statistics Results

Sector	R Squared	Adjusted R Squared	Std. error	Durbin-Watson
Public	0.548	0.461	0.028	2.071
Private	0.217	0.186	0.054	1.786

The results in Table 4.41 indicate that the Durbin Watson statistics were within the range, implying that there was no autocorrelation problem. A test for model specification was done and the results are presented in Table 4.42.

Table 4.42: Results for Breusch-Pagan LM test

Sector	Statistic	Prob.
Public	11. 319	0.026
Private	10.507	0. 041

The results in Table 4.42 indicated that the P values were less than 0.05 suggesting that pooled OLS was not appropriate. Further, Hausman test was carried out to determine whether the random or fixed-effects model was appropriate. Results are presented in Table 4.43.

Table 4.43: Hausman test Overall Results

Sector	Chi-Sq. Statistic	Chi-Sq. d.f	Prob.
Public	9.275	3	0.136
Private	8.774	3	0.239

The results in Table 4.43 show that the p-values were greater than 0.05 suggesting that the random effects model was appropriate.

This resulted to the rejection of null hypothesis and acceptance of the alternative hypothesis. Therefore, the study concluded that the preferred model for analysis was a random effect model rather than the fixed effect model.

4.5.3.2. Regression Results

Table 4.44 presents the results for the relationship between financing options and financial sustainability of universities in Kenya.

Table 4.44: Financing Options and Financial Sustainability

Indicator	Public		Private	
	Current ratio	Financial liability ratio	Current ratio	Financial liability ratio
C	0.532	0.390	0.771	0.486
	0.000	0.000	0.000	0.000
Government grant	0.412	0.134	-	-
	0.021**	0.000**	-	-
Student fees	0.356	0.298	0.761	0.582
	0.008**	0.025**	0.022**	0.025**
Other revenue	0.144	0.072	0.226	0.155
	0.017**	0.006*	0.040**	0.036**
Endowment Trust	0.112	0.030	0.387	0.048
Fund	0.041**	0.048**	0.020**	0.043**
Long-term debt	0.199	-0.776	0.523	-0.690
	0.034**	0.026*	0.031**	0.008*
Short-term debt	0.042	-0.490	0.008	-0.280
	0.031**	0.018*	0.042**	0.003*
Trade credit	0.170	-0.672	0.146	-0.493
	0.036**	0.028**	0.038 **	0.040*
R-squared	0.528	0.719	0.637	0.723
Adju. R-squared	0.486	0.671	0.570	0.684
F-statistic	16.060	14.883	11.437	11.542
Prob(F-statistic)	0.013	0.358	0.027	0.543

* indicates p-value ** indicate p-value significant at the 0.05 level

Results in Table 4.44 indicate that current ratio had a coefficient of determination (R^2) 0.528 for public universities and 0.637 for private universities. This meant that 52.8% and 63.7% of variations in current ratio were explained by variations in joint financing options of public and private universities respectively.

The results also show that financial liability ratio was 0.719 for public universities and 0.823 for private universities. This implied that 71.9% and 82.3% of variations in financial liability ratio were explained by variations in joint financing options of public and private universities respectively. In addition, the relationship between the financing options and the current ratio was significant, since $F = 16.060$ ($p = .013$) and $F = 11.437$ ($p = .027$) for public and private universities respectively. Further, the relationship between the financing options and the financial liability ratio was insignificant, since $F = 14.883$ ($p = .358$) for public and $F = 11.542$ ($p = .543$) for private universities. This revealed that the financing options variable significantly influenced the current ratio of both public and private universities in Kenya. The null hypothesis was that financing options had no influence on financial sustainability of universities in Kenya. Therefore, the study on the relationship between financing options and current was rejected and accepted the relationship between financing options and liability ratio.

The results for both public and private universities indicate that the coefficients of government grants, student fees, other revenue, endowment trust funds, long-term debt, short-term debt and trade credit were all positive and statistically significant on current ratio. This means that an increase in revenue could lead to an increase in the financial sustainability as measured by current ratio. The results further show that all the revenue streams were positive and significant while long-term debt, short-term debt and trade credit had negative and also significant coefficients on financial liability ratio as a measure of financial sustainability. This imply that a decrease in debt finance leads to decrease in total financial liabilities meaning that the universities are able to support their operations thus avoiding much borrowing of funds which enhance financial sustainability financial sustainability.

The results for financial sustainability as measured by current ratio and financial liability ratio in public and private universities implied that borrowed funds and the one from revenue streams contributed to financial sustainability of universities in Kenya. The findings of this study are consistent with the findings of Pius (2014) who found a positive and statistically significant relationship between funding sources and financial sustainability of higher education in Ghana.

Thomas (2015) observed a significant effect of funding sources on financial sustainability in European Higher education institutions. The findings confirm the work of Maria and Bleotu (2013) who found a significant influence of sources of finances on performance of higher education in Europe.

4.5.4 Analysis of Moderating Influence of Institutional characteristics on the relationship between financing options and financial sustainability.

The fourth objective was to determine the moderating influence of institutional characteristics on the relationship between financing options and financial sustainability of universities in Kenya. The following hypothesis was therefore tested using multiple linear regression model.

H_{04}: Institutional characteristics have no moderating influence on the relationship between financing options and financial sustainability of universities in Kenya.

The moderating influence was tested using a three step process as advocated by Baron and Kenny (1986). To determine the moderation interaction, the following model was used:

$$FS_{it} = \beta_0 + \beta_1 FO_{it} + \beta_2 IC_{it} + \beta_3 FO^{*} IC_{it} + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4.4$$

Where:

FS was financial sustainability, FO was composite index of financing options, IC was composite index of institutional characteristics, β_1 was coefficient for composite index of financing options, β_2 was Coefficient for moderator that is institutional characteristics, β_3 was coefficient for interaction of composite of financing options and moderator that is institutional characteristics.

4.5.4.1 Diagnostic Tests

Diagnostic tests were done in order to determine the appropriate analytic model. The tests were normality, heteroscedasticity, multi-collinearity and autocorrelation. Breusch Pagan LM test and Hausman test was also carried out in order to determine whether to use pooled OLS, fixed or random-effects model.

Table 4.45 presents results for normality.

Table 4.45: Results for Jarque-Bera Statistics test

	Statistic	Prob.
Public	11.764	0.982
Private	9.120	0.742

The results indicated that the Jarque-Bera statistic in Table 4.45 were insignificant at a 5% level of significance, suggesting that the data was normally distributed.

The alternative hypothesis was thus rejected and the study concluded that the data was normally distributed. The results for heteroscedasticity are shown in Table 4.46.

Table 4.46: Results for Heteroscedasticity -White Test

Sector	Dependent Variable	χ^2 – value	p-value
Public	Financial sustainability	18.254	0.177
Private	Financial sustainability	13.141	0.169

The results in Table 4.46 indicate that the Durbin Watson statistics were within the range, implying that there was no autocorrelation problem. The results for multicollinearity are presented in Tables 4.47.

Table 4.47: Variance Inflation Factor Results

	Public		Private	
Indicator	**I/VIF**	**VIF**	**I/VIF**	**VIF**
Government grant	0. 898	1.631	0.815	1.337
Student fees	0.611	1.702	0.640	1.501
Endowment trust funds	0.267	1.019	0.810	1.621
Other revenue	0.372	1.108	0.732	1.447
Long-term debt	0.823	1.221	0.597	1.542
Short-term debt	0.600	1.348	0.620	1.439
Trade credit	0.445	0.703	0.717	1.296
University size	0.876	1.637	0.808	1.476
Academic programmes	0.768	1.470	0.622	1.389
Mean VIF		1.569		1.609

The results presented in Table 4.47 indicates that the VIF values for all the variables were below 10 and the tolerance value (1/VIF) was below 1. The findings suggesting that there was no multi-collinearity problem. The results for autocorrelation are shown in Table 4.48.

Table 4.48: Durbin–Watson Statistics for Results

Sector	R Squared	Adjusted R Squared	Std. error	Durbin-Watson
Public	0.094	0.076	0.115	1.860
Private	0.116	0.106	0.087	1.649

The results in Table 4.48 indicate that the Durbin Watson statistics were within the range, implying that there was no autocorrelation problem. A test for model specification was done and the results are presented in Table 4.49.

Table 4.49: Results for Breusch-Pagan LM test

Sector	Statistic	Prob.
Public	10. 127	0.016
Private	9.762	0. 033

The results in Table 4.49 indicated that the P values were less than 0.05 suggesting that pooled OLS was not appropriate. Further, Hausman test was carried out to determine whether the random or fixed-effects model was appropriate. Results are presented in Table 4.50.

Table 4.50: Hausman test Overall Results

Sector	Chi-Sq. Statistic	Chi-Sq. d.f	Prob.
Public	6.542	3	0.165
Private	4.298	3	0.203

The results in Table 4.50 show that the p-values were greater than 0.05 suggesting that the random effects model was appropriate. This resulted to the rejection of null hypothesis and acceptance of the alternative hypothesis. Therefore, the study concluded that the preferred model for analysis was a random effect model rather than the fixed effect model.

4.5.4.2. Regression Results

The null hypothesis that institutional characteristics has no significant moderating influence on the relationship between financing options and financial sustainability of universities in Kenya was tested by undertaking a three step process as proposed by Barron and Kenny (1986). The first step was to determine the relationship between institutional characteristics and financial sustainability of universities in Kenya, using the following model:

$$FS_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 AP_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4.5$$

Where

FS was the financial sustainability, β_0 was the regression constant, *i* was 1, 2 …. 55 universities,

t was 1, 2 …., 6 years, $\beta_1 \ldots B_3$ were coefficients estimated, *SIZE* was the university size, *AP* was the number of academic programmers and ε was the error term. The results are presented in Table 4.51.

Table 4.51: Institutional Characteristics and Financial sustainability

Indicator	**Public**		**Private**	
	Current ratio	Financial liability ratio	Current ratio	Financial liability ratio
C	0.532	0.513	0.555	0.596
	0.000	0.121	0.000	0.243
University Size	0.612	0.632	0.417	0.331
	0.052**	0.286**	0.010**	0.263*
Academic programmes	0.356	0.391	0.255	0.120
	0.021*	0.726**	0.014*	0.582*
R-squared	0.495	0.498	0.588	0.633
Adjusted R-squared	0.352	0.424	0.426	0.624
F-statistic	16.060	10.245	11.633	11.314
Prob(F-statistic)	0.000	0.024	0.009	0.033

* indicates p-value ** indicate p-value significant at the 0.05 level

The results in Table 4.51 indicate that the prob (F-statistics) for current ratio was (0.000< .05) implying a significant relationship between institutional characteristics and current ratio. The results further indicate that the prob (F-statistics) for financial liability ratio for public and private universities were also all significant.

In step two the relationship between the independent variable, moderating variable and dependent variable was tested using the multiple regression model as follows:

$$FS_{it} = \beta_0 + \beta_1 GG_{it} + \beta_2 SF_{it} + \beta_3 OR_{it} + \beta_4 ETF_{it} + \beta_5 LTD_{it} + \beta_6 STD_{it} + \beta_7 TC_{it} + \beta_8 SIZE_{it} + \beta_9 AP_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4.6$$

Where

FS was financial sustainability (current ratio and financial liability ratio), β_0 was a constant, β_1, β_2 β_3 …… β_9 were the Beta coefficients, GG was the government grant, SF was the student fees, IGR was the internally generated revenue, ETF was the endowment trust funds, LTD was the long-term, STD was the short-term debt, TC was the trade credit, AP was the academic programmers, SIZE was the university size and ε was the error term.

Table 4.52: Financing Options, Institution characteristics and Financial Sustainability

Indicator	Public		Private	
	Current ratio	Financial liability ratio	Current ratio	Financial liability ratio
C	0.522	0.380	0.781	0.456
	0.000	0.000	0.000	0.000
Government	0.442	0.124	-	-
grant	0.011**	0.030**	-	-
Student fees	0.366	0.278*	0.751	0.582
	0.018**	0.015**	0.012**	0.015**
Other revenue	0.134	0.062	0.216	0.175
	0.027**	0.096*	0.030**	0.026**
Endowment	0.122	0.020	0.397	0.038
Trust Fund	0.036**	0.038**	0.010**	0.033**
Long-term debt	0.189	-0.760	0.533	-0.680
	0.754*	0.986*	0.289*	0.008**
Short-term debt	0.032	-0.480	0.018	- 0.260
	0.021**	0.666*	0.032**	0.713*
Trade credit	0.187	-0.692	0.246	-0.483
	0.036**	0.318*	0.028 **	0.430*
University Size	0.613	-0.269	0.127	0.390
	0.009**	0.0011**	0.038**	0.246 *
Academic	0.355	-0.610	0.708	0.390
programmers	0.022**	0.002**	0.019**	0.022**
R-squared	0.529	0.718	0.638	0.722
Adj. R-squared	0.487	0.673	0.571	0.682
F-statistic	16.050	14.853	11.447	11.522
Prob(F-statistic)	0.033	0.044	0.039	0.025

* indicates p-value ** indicate p-value significant at the 0.05 level

The results presented in Table 4.52 indicate that the prob (F-statistics) current ratio were all less than 0.05 implying that the independent variable (financing options) and the moderating variable (institutional characteristics) have a relationship with the dependent variable (financial sustainability). The third step was to test the relationship between the interaction of moderator variable on independent variable and dependent variable using the multiple regression model as follows:

$$FS_{it} = \beta_0 + \beta_1 FO_{it} + \beta_2 IC_{it} + \beta_3 FO^{*} IC_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.8$$

Where

FS was financial sustainability, FO was composite index of financing options, IC was composite index of institutional characteristics, β_1 was coefficient for composite index of financing options, β_2 was Coefficient for moderator that is institutional characteristics, β_3 was coefficient for interaction of composite of financing options and moderator that is institutional characteristics.

Table 4. 53: Moderation of institutional characteristics on the influence of financing options on financial sustainability

Variable	**Public**		**Private**	
	Current ratio	Financial liability ratio	Current ratio	Financial liability ratio
C	0.551	0.623	0.627	0.576
	0.000	0.121	0.000	0.223
Financing options (Z_{it})	0.440	0.612	0.556	0.331
	0.024**	0.376*	0.022**	0.283*
Institutional character (X_{3it})	0.358	0.251	0.543	0.120
	0.014**	0.836*	0.018**	0.582*
Interaction(Z_{it}* X_{3it})	0.468	0.251	0.541	0.570
	0.012**	0.036**	0.016**	0.044**
R-squared	0.621	0.478	0.674	0.623
Adjusted R-squared	0.556	0.424	0.568	0.513
F-statistic	21.771	10.265	10.787	11.412
Prob(F-statistic)	0.036	0.017	0.040	0.020

* indicates p-value ** indicate p-value significant at the 0.05 level

The results presented in Table 4.53 indicated that the prob (F-statistics) for current ratio in both public and private universities were less than 0.05 for independent variable, moderating and also the interaction between independent variable and the dependent variable. Moreover, the prob (F-statistics) results for financial liability ratio for public and private universities were all significant. The results implied that institutional characteristics acted as a moderator in the relationship between financing options and financial sustainability.

Based on this finding the study rejected the null hypothesis that the relationship between financing options and financial sustainability of universities in Kenya is not dependent on institutional characteristics. The study concluded that the relationship between financing options and financial sustainability of universities in Kenya is dependent on institutional characteristics.

The study findings confirm the work of Teixeira, Rocha, Biscaia and Cardeso (2014), who found institutional characteristics moderated revenue diversification and financial performance. Kuffor and Peprah (2020 found moderating effect of institutional profile on income diversification and financial sustainability of private tertiary institutions in Accra, Ghana. Similarly, Migin, Falah, Yasid and Khatibi (2015) found a positive moderating relationship between the number of academic programmes, tuition income and financial performance of private higher education institutions in Malaysia. Table 4.14 and 4.15 presents the correlation results for public and private universities respectively.

The study findings also agree with the work of Kaguri (2013), who found a moderating influence firm characteristics (size) on the relationship between firm value and financial performance of life insurance companies in Kenya. The study agrees with work of Nyongesa (2017), who established firm characteristics moderated financial management and financial performance of insurance companies in Kenya. Several other studies have explained the moderating effect of institutional characteristics (Hossaina & Khan, 2016; Ibrahim et al., 2018; Lambinicio, 2016; Kisengo, 2014; Sakawa & Watanabel, 2020). The current study contradicted the work of Ahmed et al., (2017), who found no moderating effect of firm level characteristics on the value and performance of the life sector in Pakistan. Kiganane et al., (2018) found no moderating influence of firm characteristics on capital structure and firm performance of mobile phones services in Thika town Kenya.

4.4.5 Analysis of mediating influence of funds utilization on the relationship between financing options and financial sustainability.

The fifth objective was to evaluate the mediating influence of funds utilization on the relationship between financing options and financial sustainability of universities in Kenya. The following hypothesis was tested using multiple linear regression model.

H_{05}: Funds utilization has no significant mediating influence on the relationship between financing options and financial sustainability of universities in Kenya.

4.4.5.1 Diagnostic Tests

Diagnostic tests were done in order to determine the appropriate analytic model. The tests were normality, heteroscedasticity, multi-collinearity and autocorrelation. Breusch Pagan LM test and Hausman test was also carried out in order to determine whether to use pooled OLS, fixed or random-effects model.

Table 4.54 show results for normality.

Table 4.54: Jarque- Bera Statistics test

Sector	Statistic	Prob.
Public	12.547	0.261
Private	8.889	0.105

The results indicated that the Jarque-Bera statistic in Table 4.54 were insignificant at a 5% level of significance, suggesting that the data was normally distributed. The alternative hypothesis was thus rejected and the study concluded that the data was normally distributed.

The study conducted white test to investigate the presence of heteroscedasticity. The results are shown in Table 4.55.

Table 4.55: Results for Heteroscedasticity -White Test

Sector	Dependent Variable	χ^2 – value	p-value
Public	Financial sustainability	14.139	0.341
Private	Financial sustainability	10.247	0.101

Autocorrelation was tested using Durbin Watson statistic. The results in Table 4.55 indicate that the Durbin Watson statistics were within the range, implying that there was no autocorrelation problem.

The study used variance inflation factor (VIF) to test for multicollinearity. The results are presented in tables 4.56.

Table 4. 56: Variance Inflation Factor Results

	Public		Private	
Indicator	**I/VIF**	**VIF**	**I/VIF**	**VIF**
Government grant	0.700	1.631	0.735	1.278
Student fees	0.912	2.055	0.669	1.426
Endowment trust funds	0.468	0.946	0.494	1.547
Other revenue	0.780	1.987	0.760	1.377
Long-term debt	0.690	1.347	0.514	1.216
Short-term debt	0.524	0.885	0.576	1.234
Trade credit	0.391	0.760	0.426	1.186
Recurrent expenditure	0.895	1.901	0.837	1.549
Capital expenditure	0.746	1.288	0.610	1.435
Mean VIF		1.653		1.629

The results presented in Table 4.56 indicates that the VIF values for all the variables are below 10 and the tolerance value (1/VIF) is below 1. The findings suggesting that there was no multi-collinearity problem. The results for autocorrelation are shown in Table 4.57.

Table 4. 57: Durbin–Watson Statistics Results

Sector	**R Squared**	**Adjusted R Squared**	**Std. error**	**Durbin-Watson**
Public	0.345	0.289	0.153	1.902
Private	0.266	0.172	0.220	1.755

The results in Table 4.57 indicate that the Durbin Watson statistics were within the range, implying that there was no autocorrelation problem. A test for model specification was done and the results are presented in Table 4.58.

Table 4.58: Results for Breusch-Pagan LM test

Sector	**Statistic**	**Prob.**
Public	12. 615	0.037
Private	9.980	0. 021

The results in Table 4.58 indicated that the P values were less than 0.05 suggesting that pooled OLS was not appropriate. Further, Hausman test was carried out to determine whether the random or fixed-effects model was appropriate. Results are presented in Table 4.59.

Table 4. 59: Hausman test Overall Results

Sector	Chi-Sq. Statistic	Chi-Sq. d.f	Prob.
Public	8.446	3	0.163
Private	7.276	3	0.344

The results in Table 4.59 show that the p-values were greater than 0.05 suggesting that the random effects model was appropriate. This resulted to the rejection of null hypothesis and acceptance of the alternative hypothesis. Therefore, the study concluded that the preferred model for analysis was a random effect model rather than the fixed effect model.

4.4.5.2 Regression Results

The study adopted a four step process proposed by Barron and Kenny (1986) to test the null hypothesis that funds utilization has no significant mediating influence on the relationship between financing options and financial sustainability of universities in Kenya.

Step one: Financing options and financial sustainability

The first step was to assess the relationship between the dependent variable (current ratio and financial liability ratio) and independent variables (financing options) using the following multiple regression model.

$$FS_{it} = \beta_0 + \beta_1 GG_{it} + \beta_2 SF_{it} + \beta_3 OR_{it} + \beta_4 ETF_{it} + \beta_5 LTD_{it} + \beta_6 STD_{it} + \beta_7 TC_{it} + \varepsilon_{it} \quad \ldots\ldots 4.8$$

Where

FS_{it} was financial sustainability, β_0 is regression constant, β_1 …. B_7 was Coefficients, i was 1, 2… 55 universities, t is 1,2… 6 years, GG is government grant, SF was student fees, OR was other revenue, ETF was endowment trust funds, LTD was long-term debt, STD was short-term debt, TC was trade credit and ε_{it} was Error term. The results are presented in Table 4.60.

Table 4.60: Financing Options and Financial Sustainability

Indicator	Public		Private	
	Current ratio	Financial liability ratio	Current ratio	Financial liability ratio
C	0.532	0.390	0.771	0.486
	0.000	0.000	0.000	0.000
Government grant	0.412	0.134	-	-
	0.021**	0.000**	-	-
Student fees	0.356	0.298	0.761	0.582
	0.008**	0.025**	0.022**	0.025**
Other revenue	0.144	0.072	0.226	0.155
	0.017**	0.006*	0.040**	0.036**
Endowment Trust	0.112	0.030	0.387	0.048
Fund	0.041**	0.048**	0.020**	0.043**
Long-term debt	0.199	-0.776	0.523	-0.690
	0.034**	0.026*	0.031**	0.008*
Short-term debt	0.042	-0.490	0.008	-0.280
	0.031**	0.018*	0.042**	0.003*
Trade credit	0.170	-0.672	0.146	-0.493
	0.036**	0.028**	0.038 **	0.040*
R-squared	0.528	0.719	0.637	0.723
Adju. R-squared	0.486	0.671	0.570	0.684
F-statistic	16.060	14.883	11.437	11.542
Prob(F-statistic)	0.013	0.358	0.027	0.543

* indicates p-value ** indicate p-value significant at the 0.05 level

The relationship between the financing options and the current ratio was significant, since F = 16.060, p = 0.013, F = 11.437, p = 0.027 for public and F = 15.890, p = 0.016 for private universities. Further, the relationship between the financing options and the financial liability ratio was also significant, since F = 14.883, p-value= 0.035 for public and F = 11.542, p = 0.043 for private universities.

Step two: Financing options and funds utilization (FU)

The second step was to assess the relationship between the mediating variable (funds utilization) and independent variables (financing options) using the following multiple regression model.

$$FU_{it} = \beta_0 + \beta_1 GG_{it} + \beta_2 SF_{it} + \beta_3 OR_{it} + \beta_4 ETF_{it} + \beta_5 LTD_{it} + \beta_6 STD_{it} + \beta_7 TC_{it} + \varepsilon_{it} \ldots\ldots\ldots\

Step Three: Funds Utilization and Financial Sustainability

The third step was to assess the relationship between the mediating variable (funds utilization) and the dependent variable (financial sustainability) using the regression model 4.10.

$$FS_{it} = \beta_0 + \beta_1 RE_{it} + \beta_2 CE_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4.10$$

Where, FS was the financial sustainability, β_0 was the regression constant, i was 1, 2…….55 universities. t was 1….6 years, β_1 and β_2 were coefficients estimated, RE was recurrent expenditure, CE was capital expenditure and ε was the error term.

Table 4. 62: Funds Utilization and Financial Sustainability

Indicator	**Public**		**Private**	
	Current ratio	Financial liability ratio	Current ratio	Financial liability ratio
C	0.826	0.539	0.614	0.372
	0.000	0.014	0.000	0.043
Recurrent expenditure	0.613	0.394	0.782	0.654
	0.020**	0.015**	0.008**	0.044**
Capital	0.436	0.864	0.412	0.512
Expenditure	0.018**	0.033**	0.000**	0.029**
R-squared	0.693	0.575	0.636	0.495
Adjusted R-squared	0.605	0.564	0.597	0.383
F-statistic	14.625	11.363	13.046	11.056
Prob(F-statistic)	0.000	0.041	0.000	0.037

* indicates p-value ** indicate p-value significant at the 0.05 level

Table 4.62 indicate that the relationship between the funds utilization and the current ratio was significant, since F = 14.625, p = 0.000 for public and F = 13.046, p = 0.000 for private.

Further, the relationship between funds utilization and the financial liability ratio was significant, since F = 11.363, p-value= .041 for public and F = 11.056, p = .037 for private universities. This imply that there is a relationship between funds utilization and financial sustainability.

Step Four: Financing options, funds utilization and financial sustainability.

In step four all the three variables namely, financing options, funds utilization and financial sustainability were entered into a multiple regression equation to test for mediation. The model is as follows;

$$FS_{it} = \beta_0 + \beta_1 GG_{it} + \beta_2 SF_{it} + \beta_3 OR_{it} + \beta_4 ETF_{it} + \beta_5 LTD_{it} + \beta_6 STD_{it} + \beta_7 TC_{it} + \beta_8 RE_{it} + \beta_9 CE_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4.11$$

Where

FS was the financial sustainability, β_0 was the regression constant, i was 1, 2…….55 universities. T was 1, 2….6 years, β_1 ..... β_7 were coefficients estimated, GG was government grants, SF was student fees, EFT was endowment trust funds, OR was other revenue, LTD was long-term debt. STD was short-term debt, TC was trade credit, RE was recurrent expenditure, CE was capital expenditure and ε is the error term. Regression results to estimate path 'b' recurrent expenditure and capital expenditure as mediator are represented in Table 4.63 and 4.64 respectively.

Table 4. 63: Mediation of Recurrent Expenditure on Financing Options and FS

Indicator	**Public**		**Private**	
	Current ratio	Financial liability ratio	Current ratio	Financial liability ratio
C	0.801	0.548	0.472	0.700
	0.000	0.000	0.000	0.000
Government grant	0.667	0.603	-	-
	0.000**	0.025**	-	-
Student fees	0.599	0.536	0.695	0.636
	0.000**	0.040**	0.000**	0.026**
Other revenue	0.480	0.459	0.588	0.589
	0.024**	0.200*	0.005**	0.150*
Endowment Trust	0.295	0.143	0.038	0.074
Fund	0.145*	0.389*	0.267*	0.316*
Long-term debt	-0.609	-0.643	-0.442	-0.633
	0.146*	0.004**	0.238 *	0.024**
Short-term debt	0.365	-0.532	0.109	-0.630
	0.227*	0.034**	0.223*	0.315*
Trade credit	0.276	-0.157	0.178	-0.527
	0.130**	0.119*	0.118*	0.018**
Recurrent	-0.686	-0.607	-0.693	-0.545
expenditure	0.022**	0.203*	0.042 **	0.116*
R-squared	0.455	0.339	0.796	0.586
Adjusted R-squared	0.432	0.265	0.741	0.507
F-statistic	18.005	8.867	13.343	10.266
Prob(F-statistic)	0.000	0.042	0.007	0.036

* indicates p-value ** indicate p-value significant at the 0.05 level

Table 4.64 : Mediation of Capital Expenditure on Financing Options and FS

Indicator	Public		Private	
	Current ratio	Financial liability ratio	Current ratio	Financial liability ratio
C	0.672	0.543	0.564	0.213
	0.000**	0.000**	0.000**	0.000**
Government grant	0.477	0.632	-	-
	0.000**	0.010**	-	-
Student fees	0.432	0.608	0.669	0.684
	0.000**	0.039**	0.000**	0.013**
Other revenue	0.136	0.382	0.104	0.245
	0.222*	0.291*	0.048**	0.332*
Endowment Trust	0.154	0.170	0.103	0.044
Fund	0.466*	0.212*	0.323*	0.142*
Long-term debt	-0.546	0.686	-0.324	0.663
	0.521*	0.020**	0.353 *	0.004**
Short-term debt	-0.327	0.449	-0.110	0.590
	0.136*	0.038**	0.040**	0.586*
Trade credit	-0.541	0.178	-0.166	0.654
	0.035**	0.135*	0.028**	0.231*
Capital	-0.386	-0.675	-0.267	-0.655
Expenditure	0.042**	0.005**	0.036 **	0.027**
R-squared	0.475	0.853	0.645	0.338
Adjusted R-squared	0.458	0.732	0.596	0.321
F-statistic	13.621	11.505	9.443	12.268
Prob(F-statistic)	0.679	0.027	0.315	0.040

* indicates p-value ** indicate p-value significant at the 0.05 level

The results in Table 4.61 show that the models for recurrent expenditure were significant (P-values were less than 0.05) hence a product of the coefficient was obtained which was 0.188 for public, 0.125 for private universities. To estimate path 'b', model results in table 4.62 was used to estimate mediation influence of recurrent expenditure on the relationship between financing options and financial sustainability for each of the two financial sustainability measures employed. When current ratio was employed as a measure of financial sustainability, the results in Table 4.63 indicate that the model was significant (P-value 0.000 <0.05) for public and private universities.

This implied that the model results were used to estimate mediation influence of recurrent expenditure. A product of the coefficients was therefore obtained to estimate path ‘b’ which was -0.132 for public and -0.283 for private. The product of path ‘a’ and ‘b’ was -0.025 for public and -0.035 for private universities. This indicates a negative mediation effect of recurrent expenditure implying that when recurrent expenditure decreases, there is reduction in total cost. This confirms that when funds are utilized efficiently, universities are able to sustain their operations thus improving their financial position.

Further, results in Table 4.63 indicate that the models for estimation of path ‘b’ was significant when financial liability ratio was adopted as a measure of financial sustainability. A product of the coefficients was therefore obtained to estimate path ‘b’ which was -0.111 for public and -0.212 for private universities. The product of path ‘a’ and ‘b’ was -0.021 for public and -0.027 for private universities. This indicate a negative mediation influence of capital expenditure implying that a decrease in capital expenditure saves on total revenue thus increasing financial sustainability as measured by total liabilities to total revenue.

The results in Table 4.61 also show that the models for capital expenditure are significant (P-values less than 0.05) hence a product of the coefficient was obtained which was 0.285 for public and 0.447 for private universities. To estimate path ‘b’, model results in Table 4.64 was used to estimate mediation influence of capital expenditure on the relationship between financing options and financial sustainability for each of the two financial sustainability measures employed. When current ratio was employed as a measure of financial sustainability, the model for estimating path “b” was insignificant (P-value of 0.679> 0.05 and 0.325>0.05) hence it could not be used for estimation. Further, financial liability ratio was employed and the results for public and private universities indicated that the models were significant (P-values less than 0.05). This implied that the model results were used to estimate mediation influence of capital expenditure. A product of the coefficients was therefore obtained to estimate path ‘b’ which was -0.080 for public and -0.297 for private universities. The product of path ‘a’ and ‘b’ was -0.023 for public and -0.133 for private universities.

This indicate a negative mediation influence of capital expenditure, implying that a decrease in capital expenditure saves on operational cost leading to enhancement in financial sustainability.

The study findings confirm the work of Omokri et al., (2018) who found a mediation between recurrent and capital expenditure on crude oil and economic growth in Nigeria, Mahmood (2015) who reported mediation effects of advertising expenditure on total effects and labor productivity in Pakistan industries. Iheanacho (2016) who documented mediating effect of recurrent expenditure on short run and economic growth in Nigeria. Other researchers who documented mediation effect (Wathaka, 2014; Mbithi, 2014; Kibet, 2021). The study contradicts the work of Elsivera and Abdallah (2017) who established that capital expenditure did not mediate the relationship between generated revenue and economic growth of Bengkulu province in Indonesia and Kato (2019) who established no mediation effect of organizational resources on the relationship between strategy implementation and performance of devolved ministries in Kenya.

4.6 Summary of the hypothesis tested

Table 4.65 presents the summary of hypotheses tested.

Table 4.65: The Summary Models for Hypotheses Tested

Objective	Research Hypothesis	Results	Decision
To determine the influence revenue streams on financial sustainability of universities in Kenya.	Revenue streams have no influence on financial sustainability of universities in Kenya.	Revenue streams had a statistically significant influence on the financial sustainability of universities in Kenya.	The null hypothesis was rejected.
To assess the influence of debt financing on financial sustainability of universities in Kenya	Debt financing has no influence on financial sustainability of universities in Kenya.	Debt financing had a statistically significant influence on the financial sustainability of universities in Kenya.	The null hypothesis was rejected.
Examine the joint influence of financing options on financial sustainability of universities in Kenya.	Financing options have no joint influence on financial sustainability of universities in Kenya.	Financing options had a statistically significant joint influence on financial sustainability of universities in Kenya.	The null hypothesis was rejected.
To determine the moderating influence of institutional characteristics on the influence of financing options on financial sustainability of universities in Kenya	Institutional characteristics has no moderating influence on the relationship between financing options and financial sustainability of universities in Kenya.	Institutional characteristics had a statistically significant moderating influence on the relationship between financing options and financial sustainability of universities in Kenya.	The null hypothesis was rejected.
To assess the mediating influence of funds utilization on the relationship between financing options and financial sustainability of universities in Kenya	Funds utilization has no mediating influence on the relationship between financing options and financial sustainability of universities in Kenya	Funds utilization had a statistically significant mediating influence on the relationship between financing options and financial sustainability of universities in Kenya.	The null hypothesis was rejected.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of study findings, conclusions and the policy recommendations. Finally, areas for further study are given.

5.2 Summary of Findings

The broad objective of this study was to determine the influence of financing options and financial sustainability of universities in Kenya. In addition, the study sought to establish the moderation of institutional characteristics and mediation of funds utilization on the relationship between financing options and financial sustainability of universities in Kenya. Five specific objectives were developed and addressed through testing five hypotheses. The hypotheses were tested using data from audited financial statements and reports from universities in Kenya for a period of 6 years, from 2015 to 2020. Multiple linear regression was employed to determine the influence of each independent variable namely; revenue streams and debt financing on financial sustainability which was the dependent variable of the study. Multiple and stepwise regression analysis was performed to determine whether institutional characteristics had a moderating influence on the relationship between financing options and financial sustainability. Stepwise regression was also used to determine whether funds utilization had a mediating influence on the relationship between financing options and financial sustainability.

The first objective sought to determine the influence of revenue streams on financial sustainability of universities in Kenya. Revenue streams comprises of government grant, student fees, other revenue and endowment trust funds. The study revealed that government grant, student fees, other revenue and endowment trust funds had a positive significant influence on current ratio and financial liability ratio of financial sustainability of public universities in Kenya. In private universities, the findings revealed that student fees, other revenue and endowment trust funds had a positive significant influence on current ratio and financial liability ratio employed as measures of financial sustainability.

The second objective sought to assess the influence of debt financing on financial sustainability of universities in Kenya. The measures to debt financing included long-term debt, short-term debt and trade credit. In public universities, the study found that long-term debt had insignificant influence on current ratio, while short-term debt and trade credit had positive significant influence on current ratio. The study further revealed that long-term debt, short-term debt and trade credit had also negative significant influence on financial liability ratio of public universities. The results for private universities also established that short-term debt and trade credit had positive significant influence on current ratio, while long-term debt had insignificant influence on current ratio. Moreover, the study found that the three indicators of debt financing had a significant negative influence on financial liability ratio.

The third objective sought to examine the joint influence of financing options which comprised of government grant, student fees, other revenue and endowment trust funds, long-term debt, short term debt and trade credit on financial sustainability of universities in Kenya. In public universities, the study found that all the government grant, student fees, other revenue, endowment trust funds, long-term debt, short term debt and trade credit had positive significant joint influence on current ratio as a measure of financial sustainability. The study further established that student fees, endowment trust funds, other revenue long-term debt, short term debt and trade credit had a positive significant joint influence on current ratio for private universities. In addition, the results for revenue streams were positive and significant while long-term debt, short-term debt and trade credit had negative and significant joint influence on financial liability ratio employed as a measure of financial sustainability for both public and private universities.

The fourth objective sought to evaluate the moderating influence of institutional characteristics on the relationship between financing options and financial sustainability of universities in Kenya. The measures to institutional characteristics were number of students and number of academic programmes. In public universities, the study established that interaction of institutional characteristics and financing options had a positive significant influence on current ratio.

In addition, interactions of institutional characteristics and financial liability ratio had a significant positive influence on public universities financial sustainability. Further, the results for private universities revealed a significant influence between financing options and current ratio. The study also observed a significant influence on financial liability ratio when institutional characteristics interacted with financing options.

The fifth objective sought to assess the mediating influence of funds utilization on the relationship between financing options and financial sustainability of universities in Kenya. The two measures of funds utilization, that is recurrent expenditure and capital expenditure were used as mediators and separate results were obtained. First, the study investigated whether recurrent expenditure had a mediation influence on the relationship between universities' financing options and financial sustainability as measured by current ratio and financial liability ratio. In public universities, the study found that recurrent expenditure had a negative mediation influence on the relationship between government grant, student fees, other revenue, endowment trust funds, short-term debt, trade credit and current ratio.

However, the study revealed that recurrent expenditure had no mediation influence on the relationship between long-term debt and current ratio. Second, the study investigated whether recurrent expenditure had any mediation influence on the relationship between public universities financing options and financial sustainability as measured by financial liability ratio. The study found that recurrent expenditure had a negative mediation influence on the relationship between long-term debt, short-term debt and trade credit and financial liability ratio. In addition, the study established that recurrent expenditure had positive mediation influence on government grant, student fees, and financial liability ratio, while other revenue and endowment trust funds had insignificant mediation influence on the relationship between financing options and financial sustainability.

In addition, the study investigated whether capital expenditure had a mediation influence on the relationship between financing options and financial sustainability as measured by current ratio and financial liability ratio. The study found that capital expenditure had a negative mediation influence on the relationship between government grant, student fees, short-term debt, trade credit and current ratio.

However, the study established that capital expenditure had no mediation influence on the relationship between other revenue, long-term debt, endowment trust funds and current ratio.

Fourth, the study assessed whether capital expenditure had a mediation influence on the relationship between financing options and financial sustainability as measured by financial liability ratio. The study established that capital expenditure had a negative mediation influence on the relationship between government grant, student fees, long-term debt and financial liability ratio. However, the study found that capital expenditure had no mediation influence on the relationship between other revenue, endowment trust funds, short-term debt, trade credit and financial liability ratio.

In private universities, the study found that recurrent expenditure had a negative mediation influence on the relationship between student fees, other revenue, short-term debt, trade credit and current ratio, while endowment trust funds and long-term debt had no mediation influence on current ratio. The study further revealed that capital expenditure had a negative mediation influence on the relationship between student fees, other revenue, trade credit and current ratio, while endowment trust funds and long-term debt had no mediation influence on current ratio. In regard to financial liability ratio the results established that recurrent expenditure had a negative mediation between student fees, long-term debt, short-term debt, trade credit and financial liability ratio.

However, there was no mediation influence between other revenue, endowment trust funds, and financial liability ratio. The results also found that capital expenditure had a mediation influence between student fees, long-term debt and financial liability ratio, while other revenue, short-term debt endowment trust funds, trade credit and financial liability ratio were not mediated by capital expenditure. Further, the results found capital expenditure had no mediation influence on the relationship between financing options and financial sustainability as measured by current ratio.

5.3 Conclusions

First, the study investigated the influence of revenue streams and financial sustainability of universities in Kenya. The study concluded that government grant, student fees, endowment trust funds and other revenue influenced financial sustainability of public and

private universities. Secondly, the study examined the influence of debt financing on financial sustainability of universities in Kenya.

The study concluded that short-term debt and trade credit influence financial sustainability as measured by current ratio while long-term debt was not significant for public and private universities. Based on the findings, the study concluded that funds from short-term debt and trade credit support the liquidity position in public and private universities. The study further concluded that long-term debt, short-term debt and trade credit influenced financial sustainability as measured by financial liability ratio. Optimal debt levels contributed to the running and development of universities thus boosting financial sustainability.

Thirdly, the study assessed the influence of joint financing options on financial sustainability. The study concluded that financing options in regard to revenue streams influence financial sustainability as measured by financial liability ratio except for endowment trust funds while financing from debts negatively influenced financial sustainability. In general, borrowed funds and revenue streams when combined together contributed to financial sustainability of universities in Kenya.

Fourth, the study evaluated the moderating influence of institutional characteristics on the relationship between financing options and financial sustainability of universities in Kenya. In line with the findings, the study concluded that institutional characteristics had a moderating influence on the relationship between financing options and financial sustainability when each of the two measures of financial sustainability were employed. On the interactions of institutional characteristics and the financing options, the study concluded that interaction of institutional characteristics and the financing options had significant influence on both current ratio and financial liability ratio as metrics for financial sustainability for public and private universities. Lastly, the study concluded that recurrent expenditure had a negative mediation influence on financial sustainability as measured by current ratio and financial liability ratio.

The study also concluded that capital expenditure negatively mediates on the relationship between financing options and financial sustainability.

A conclusion was drawn from the results that funds utilization mediates the relationship between financing options and financial sustainability as measured by current ratio and financial liability ratio for both public and private universities.

5.4 Recommendations

This section presents recommendations to the government and university management based on the findings of the study. To supplement the main stream revenue, the government needs to provide policies and monitor implementation of revenue generating activities. Provision of benchmarking opportunities both local and international for universities help to analyze ways of enhancing revenue generation. In public universities, the government can support farming activities by provision of grants, subsidies and marketing opportunities for the products. This will enhance growth and boost revenue leading to financial sustainability. The government can also encourage universities to form foundations by provision of funds and grants in a manner to enhance knowledge utilization in universities.

The government needs to come up with relevant policy frameworks that provides guidance and direction in reference to formation, implementation and operation of these foundations. This can be done by proper consultation and involvement of universities in preparation of these documents for the purpose of ownership and information flow which is crucial for success. Public and private universities offer academic programmes approved by the commission for university education. The government need to revisit the policy of the existing academic programmes and consider providing market based and flexible programmes which can make the graduates give back to the universities in terms of expertise that attracting revenue. There is need to have proper budgeting as it is a planning process that coordinates many activities and influences success. Government ought to take into consideration the challenges that exist in both private and public universities and thereby enhance proper budgeting and policy frameworks in order to encourage proper utilization of funds. In order to support the government grants and student fees, the management of both private and public universities need to develop and

strengthen a policy on sustainable endowment trust funds by involving student alumni and various stakeholders.

The policy may be formulated to raise funds periodically and the funds can be used to assist university operations. Secondly, the university top management need to develop and strengthen a policy on income generating activities which can generate more incomes in both public and private universities. To remedy this, the management need to appoint a committee of professionals drawn from both university academic and non-academic staff to manage such activities. The committee need to consider activities such as farming activities for instance; cash crops, livestock, fishing, carrying out business activities such as food shops like cafe, restaurant since demand for meals is very high in a university setting, consider partnership in real estate to establish affordable hostels for students and even staff who want to rent houses, establish cyber services, bookshops and publishing houses, among others.

Third, the university top management for both private and public universities need to develop and strengthen a policy on debt financing. The management can appoint debt financing committee and charge them with the responsibility of soliciting for low cost sources of debts such as long-term debt, short-term debt and trade credit at lower cost and at a favorable term. The committee need to explore all ways of acquiring debt for prioritized expenditure and the policy to be strictly followed in order to allow universities pay less in terms of servicing debt and thereby leading to financial sustainability. Fourth, the university management needs to develop and evaluate policy on introduction of new academic programs and especially those that attract more students into the university.

The policy on new programmes can contain an aspect of flexibility of doing the course since the higher the flexibility the more the students translating to more fees income which leads to financial sustainability. Universities also need to rigorously market their programmes by targeting more secondary schools and employers of various organizations to train and offer consultancy services to their employees. Fifth, the university management of both public and private universities should enforce and strengthen a policy on funds utilization.

The management can appoint a professional committee which may comprise of finance managers, accountants, registrars and DVC- planning and finance. This committee need to develop priorities of both recurrent and capital expenditure so that before money is spent, the committee evaluates reasons for expenditure and possible future gains.

5.5 Areas for Further Research

The study recommend that a similar study can be carried out on public and private middle level tertiary learning institutions, secondary schools and primary schools. The study suggest that the same study can be replicated on the overall universities in Kenya. The study can be expounded to other universities in African countries and worldwide at large.

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APPENDICES

Appendix I: Data Collection Sheet

ITEM/YEAR	2015	2016	2017	2018	2019	2020
Current liabilities						
Total revenue						
Total liabilities						
Long -term loans						
Short-term loans						
Current Assets						
Recurrent expenditure						
Capital expenditure						
Accounts payable						
Other revenue						
Grant from Government						
Endowment trust funds						
Total student fees						
Number of students						
Number of academic programs						

Appendix II: List of Accredited Universities in Kenya up to year 2020

NO.	UNIVERSITY	YEAR OF ESTABLISHMENT
1.	University of Nairobi	1970
2.	Moi University	1984
3.	Kenyatta University	1985
4.	Egerton University	1987
5.	Jomo Kenyatta University of Science and Technology	1994
6.	Maseno University	2001
7.	Chuka University	2007
8.	Dedan Kimathi University of Science and Technology	2007
9.	Kisii University	2007
10.	Masinde Muliro University of Science and Technology	2007
11.	Pwani University	2007
12.	Technical University of Kenya	2007
13.	Technical University of Mombasa	2007
14	Maasai Mara University	2008
15.	Meru University of Science and Technology	2008
16.	Multimedia University of Kenya	2008
17.	South Eastern Kenya University	2008
18.	Jaramogi Oginga Odinga University of Science and Technology	2009
19.	Laikipia University	2009
20.	University of Kabianga	2009
21.	Karatina University	2010
22.	University of Eldoret	2010
23.	Kibabii University	2011
24.	Kirinyaga University	2011
25.	Machakos University	2011
26.	Murang'a University of Science and Technology	2011
27.	Rongo University	2011

NO.	UNIVERSITY	YEAR OF ESTABLISHMENT
28	Taita Taveta University	2011
29.	The Co-operative University of Kenya	2011
30.	University of Embu	2011
31.	Garissa University	2011
32.	Catholic University of Eastern Africa	1989
33.	Daystar University	1989
34.	United States International University	1989
35.	Africa Nazarene University	1993
36.	Kenya Methodist University	1997
37.	St. Paul's University	1989
38.	Pan Africa Christian University	1989
39.	Strathmore University	2002
40.	Mount Kenya University	2008
41.	KCA University	2007
42.	Tangaza University College	1997
43.	Uzima University College	2012
44.	Hekima University College	1993
45	Marist International University College	2002
46.	Aga Khan University	2002
47.	Kiriri Women's University of Science and Technology	2002
48.	GRETSA University	2006
49.	Presbyterian University of East Africa	2007
50	The East African University	2010
51.	Management University of Africa	2011
52.	Pioneer International University	2012
53.	Riara University	2012
54.	UMMA University	2013
55.	Zetech University	2014

Appendix III: Summary of the Research Gaps

Author(s)	Focus of the Study	Methodology Used	Findings	Knowledge Gap	Focus of Current Study
Metto & Ombaba (2021)	Debt financing and financial sustainability on private secondary schools in Uasin Gishu County.	A descriptive survey research design, stratified and random sample techniques	Trade credit financing supported the running of secondary schools in Kajido County.	The study was limited to debt financing and financial sustainability of private secondary schools only	The study focused on debt financing and financial sustainability of both public and private universities
Estermann (2020)	Effect of diversification of income streams on financial sustainability of European Universities.	Questionnaires, case studies and seminars were used to collect data.	The student fees significantly influenced financial status of most European Universities	The study overlooked other forms of revenue streams such as government grants, endowment trust funds and other revenues.	The study considered government grant, endowment trust funds and other revenues as sources of revenue streams
Ngenoh (2020)	Influence of third stream activities on university sustainability; a comparative study of Zuri and Bidii universities.	Qualitative and quantitative data	The study found positive significant influence of third stream activities on university sustainability.	The study concentrated on only third streams. In addition, the author considered comparative of two universities only.	The study focused on all the revenue streams, moderated and mediated. The comparative analysis was done on 31 public and 24 private universities in Kenya.

Author(s)	Focus of the Study	Methodology Used	Findings	Knowledge Gap	Focus of Current Study
Chumba, Muturi & Oluoch (2020)	Effects of green finance, unpacking donor funding and financial sustainability in Kenya	Secondary data was collected from public and private universities using census method	A positive association between donor funding and financial sustainability of universities in Kenya.	The study was limited to effects of green financing and unpacking donor funding	The study focused on revenue streams and debt financing
Lee, Kim & Lee (2020)	Factors that affect students' satisfaction in South Korean higher education institutions.	Applied questionnaires and the agency theory	The study found that a rise in tuition fees result to a decline in government subsidies and vice versa.	The study considered all higher education institutions and applied agency theory by collecting data through questionnaires	The study assessed the effect of student fees on universities and used resource dependency theory and collected panel data.
Kuffor & Peprah (2020	Correlate of income diversification and financial sustainability of private tertiary institutions as moderated by profile.	Primary data was collected using questionnaires on forty-four	The study revealed a significant and moderation effect of institutional profile on income diversification and financial sustainability of private tertiary institutions in Accra, Ghana	The study was done on private tertiary institutions and use primary data.	The study used panel data of both public and private universities

Author(s)	Focus of the Study	Methodology Used	Findings	Knowledge Gap	Focus of Current Study
Sola, Teruel & Martinez-Solano(2020)	Effect of financing on Profitability on institutions of learning.	Sample size of 11337 Spanish institutions of learning for the period from 2015-2019.	The study found a positive linear relationship between trade credit and institutional performance derived from the fact that the benefits associated with trade credit surpass the costs of vendor financing. The study also found that receivables on firm profitability differs depending on certain firms' characteristics.	The study was limited to one component of revenue stream that is trade credit as a financing option.	The study focused on various components of revenue streams and various components of debt financing options.
Chumba, J. A., Muturi.W & Oluoch, J.O. (2019)	Effect of financial investment strategies on the financial sustainability of universities in Kenya	Descriptive design, questionnaires and linear multiple regression	Investment strategy can be harnessed by universities in order to help secure funding in order to run various projects	The study used a sampling method and ignored other contributing factors to financial sustainability of Kenyan universities	The researcher conducted a census study and used moderating and mediating variables to assess the financial sustainability of Kenyan universities

Author(s)	Focus of the Study	Methodology Used	Findings	Knowledge Gap	Focus of Current Study
Ahmad, Ismail & Siraj (2019)	Effects of officers perceptions of financial sustainability in Malaysian Public Universities	Primary data was used.	The study found that increasing student fees was not feasible method of enhancing sustainability and therefore there was need to engage in third stream activities to enhancing sustainability	The study was limited to officers' opinion on financial sustainability of universities. Ignoring the fact that opinions may not always be practically implemented	The study focused on financing options on financial sustainability of public and private university in Kenya.
Kimanthi (2019)	Effects of debt financing on financial performance of public universities in Kenya	Secondary data	Debt financing had a negative and significant effect to financial performances of public universities	The study was limited to only public universities	The study focused on both public and private universities.
Kato (2019)	Mediating effect of organizational resources on the relationship between strategy implementation and performance of devolved ministries among selected counties in northern Kenya.	A census, primary data was collected through close-ended questionnaires.	The study established no mediation effect of organizational resources on the relationship between strategy implementation and performance of devolved ministries in Kenya.	The study was done on devolved ministries selected counties in northern Kenya and used strategy implementation as independent variable and performance as dependent variable	The study was done on universities and considered financing options as independent variable and financial sustainability as dependent variable

Author(s)	Focus of the Study	Methodology Used	Findings	Knowledge Gap	Focus of Current Study
Oseni, (2019)	Effect of adequacy of budgetary allocation and institutional performance of education institutions in Nigeria.	Descriptive, Co-integration techniques and VAR model was used	The study established a negative and significant mediating effect of expenditure on institutional performance	The study considered all education institutions and used Co-integration techniques and VAR model.	The study focused only on universities and used random effect model
Karuma, Ndambiri & Oluoch (2018)	Debt financing on the financial performance of manufacturing firms in Nairobi Stock Exchange.	Quantitative, descriptive and multiple linear regression analyses	The study found a positive and significant relationship between accounts payable and return on assets of manufacturing firms in NSE.	The study was limited to manufacturing firms NSE to assess the effect of debt financing on the financial performance	The study focused on debt financing in Kenyan universities
Ahmed, Siraj & Ismali (2019)	Revenue diversification on sustainability of public higher learning institution in Malaysia	Hierfindah Index	Majority of public higher learning institutions are dependent on public funds.	The study ignored debt financing as a component of financing options	The study used debt financing as an option of financing option through computation of ratios.
Omokri, Agbedeyi, Nwaje & Agiligia (2018)	Mediating effects of recurrent expenditure on crude oil and economic growth in Nigeria.	Statistical mediation, causal steps and product of coefficients	The study found that there was a significant mediation effect of recurrent expenditure on crude oil and economic growth in Nigeria.	The study was done on crude oil and economic growth in Nigeria.	The study focused on sustainability of universities in Kenya

Author(s)	Focus of the Study	Methodology Used	Findings	Knowledge Gap	Focus of Current Study
Panigrahi (2018)	Relationship between funding and outcomes of HLIs in India	Questionnaires were used	Positive correlation between funds and outcomes of HLIs and that mix of various funding methods such as public exchequer, students fees, graduate tax and private sector funding positively impact on financial performance of HLIs	The study ignored critical ratios (such as current and financial liability ratio) of performance as an outcome of HLIs.	The study used current and financial liability ratio as measures of performance of both public and private universities.
Waithaka (2018)	Corporate identity management practices, organizational characteristics, corporate image and brand performance of Kenyan universities	Descriptive survey, primary and secondary data, linear regression	Organizational characteristics are likely to influence range of business activities such as, Research and Development initiatives as well as ability to adopt technological innovations.	The study focused on organizational characteristics, on corporate identity management practices and used cross sectional data and target population of 53 universities	The study considered institutional characteristics on financing options and applied longitudinal approach with a target population of 55 universities

Author(s)	Focus of the Study	Methodology Used	Findings	Knowledge Gap	Focus of Current Study
Obuya (2017)	Debt financing option and financial performance of Micro and Small Enterprises(MSE)	Quantitative, descriptive, associative and Predictive analyses, pecking order, static trade off and optimal capital structure theories	The study found that debt usage is advantageous because of tax deductibility of its interest on income to arrive at net taxable income, its low-cost nature	The study was limited to Micro and Small Enterprises (MSE) which have totally different characteristics from universities	The study focused on public and private universities and used random effect model to analyze data
Ng'anga'a, (2017)	The effect of debt financing and financial performance of secondary schools in Kajiado County.	A descriptive research design and census	The study established that overall debt financing had positive and insignificant effects on financial performance of private secondary schools in Kajiado County	The study was based on secondary schools only which vary with those of universities	The study was done in both public and private universities
Koskie (2017)	Relationship between long term debt ratio, debt to asset ratio debt to equity ratio and financial performance of private sugar manufacturing companies in Kenya.	Secondary data was collected from all 6 private sugar manufacturing companies	The study revealed that long term debt had a significant effect on financial performance of private sugar manufacturing companies in Kenya.	The study was limited to effect of debt financing on financial performance of manufacturing Co. The study ignored other financing options.	The study focused on effect of both debt financing and revenue streams on financial sustainability of universities in Kenya

Author(s)	Focus of the Study	Methodology Used	Findings	Knowledge Gap	Focus of Current Study
Katiwa (2017)	Effect of trade credit on share value of private secondary schools.	Secondary data, descriptive cross-sectional research design and a multiple linear regression model	Trade credit and assets of the firm are statistically significant determinants of value of private secondary schools while capital structure is an insignificant determinant.	The study was done in private secondary schools to assess the effect of trade credit on share value	The study concentrated on universities to determine the influence of debt financing on financial sustainability
Cernostana (2017)	Financial sustainability for private higher education institutions in Europe	Case study	Long term stability of an institution is defined by its financial sustainability	The study concentrated on determinants of financial sustainability in private HEIs only	The study focused on influence of financing options on financial sustainability of both private and public universities in Kenya
Hussin & Rashid (2017)	effect of diversification of income generation on financial sustainability of universities in Malaysia	Qualitative approach and content analysis	Income generated from various sources contribute to financial sustainability of Malaysian universities	The study was limited to one component of revenue streams and used qualitative approach	The study used various component of revenue streams such as government grants, student fees, endowment trust funds. Applied quantitative approach.
Imana (2017)	The determinants of public education expenditures in Kenya.	Descriptive research design, quantitative approach, secondary	The actual amount of money spend on Kenyan education relate with public expenditures	The study used expenditure as independent variable	The study used expenditure as mediator variable

	expenditures in Kenya	data and multiple regression analysis	sector is less than what is allocated.	concentrated on only expenditures of the entire education sector in Kenya	focus on financing options, utilization of funds, institutional characteristics on financial sustainability of Kenyan universities.
Elsivera & Abdallah (2017)	Mediating effect of capital expenditure on the effect of revenues, allocation fund and tax/nontax sharing on economic growth of Bengkulu province in Indonesia.	Secondary data, fixed effect model	The findings were that capital expenditure did not mediate the relationship between generated revenue, allocated fund and tax sharing fund on economic growth of Bengkulu province in Indonesia.	The study was limited to the economic growth of a country	The study focused on spending of expenditure in Kenyan universities
Onchang'a, Muturi & Atambo (2016)	Effects of leverage financing in financial performance of selected firms listed in Nairobi Stock Exchange	Secondary data was collected from 60 firms listed in Nairobi Stock Exchange	The study revealed that a unit increase in short term debt reduced return on asset	The study was limited to selected firms listed in Nairobi Stock Exchange	The study focused on public and private universities in Kenya

Miranda, Chamorro & Rubio (2016)	Effects of income generating projects on enhancing financial sustainability in University of Eastern Philippines.	Descriptive-correlation research design	Third-stream activities enhanced total income enhancing financial sustainability of university of Eastern Philippines	The study was limited to one financing option that is income generating projects.	The study used various financing options which include revenue streams (such as government grant, student fees and endowment trust funds) and debt financing(such as long term debt, short term debt and trade credit)
Nganga & Kibati (2016)	Determinants of financial sustainability in private middle level colleges in Nakuru County, Kenya	Descriptive survey design, questionnaires	Capital structure and resource allocation had significant influence on financial sustainability.	The study ignored other financial factors and was limited to private middle level colleges and	The focus was on universities and considered moderating and mediating variable
Mutinda & Ngahu (2016)	Determinants of financial sustainability in non-governmental (NGOs) organizations in Nakuru County in Kenya	Data collected through questionnaires using stratified random sampling	The study found financial resource mobilization has a non-significant influence on financial sustainability	The study was limited to non-governmental organizations (NGOs) in Nakuru Kenya	The study focused on both public and private universities

Mohmood (2015)	Mediating effect of advertising expenditure on total effects and labor productivity of manufacturing Industries in Pakistan	A case study, census	There was a mediation effects of advertising expenditure on total effects and labor productivity in Pakistan manufacturing industries.	The study was limited to manufacturing Industries and considered mediation of advertising expenditure on total effects and labor productivity	The study was done in universities looked at funds utilization as a mediator on financing options and financial sustainability
Gabrijelcic, Heman & Lenarcic (2015)	Impact of financial debts and foreign funding on firm performance in Slovenia	Panel data, sampling method	The study revealed insignificant negative effect of debt funds and firm performance.	The study was limited to Impact of financial debts and foreign funding on firm performance and ignored other forms of financing such as revenue streams	The study focused on revenue streams as financing options
Ahmed (2015)	Financing of private and public higher learning institutions in Nigeria	Interviews and secondary data was used	The author found that public higher learning institutions only receive small allocations from the government, which needed to be supplemented by other revenue sources.	The study only considered tuition income and public subsidies as funding sources, ignoring other sources such as donations	The study considered student fees, government funds, other internally generated revenue, donations and borrowed funds

Kajirwa (2015)	Effects of debt in firm performance of commercial banks listed on Nairobi Securities Exchange	Correlational and regression model	The study revealed that leverage was negative and insignificant to the performance of Commercial banks	The study focused on the banking sector which has different characteristics from institution of earlier learning	The study concentrated on influence of various financing options such as revenue streams and debt financing public and private universities.
Thomas (2015)	Funding sources on financial sustainability of higher education in European higher education institutions.	Secondary data, multiple linear regression.	The study findings were that funding sources are the key income structure influencing financial sustainability in European higher education institutions.	The study was done on funding sources on financial sustainability of European HEIs	The study focused on financing options and financial sustainability of Kenyan universities
Kapkiyai & Mugo (2015)	Effect of trade credit on financial performance of private schools :Evidence of Eldoret town, Kenya	Secondary data was collected through documentary guide and analysis was conducted using both inferential and descriptive statistics specifically mean and standard deviation.	The study revealed that the trade credit positively affected liquidity, profit margin and return on assets	The study was limited to private secondary Schools which have different characteristics from university settings. Further, the study focused on trade credit as source of financing .	The study focused on influence of various financing options on financial sustainability of public and private universities in Kenya.

Saad, Ghani, Ahmed & Salim (2015)	Effect of debt financing, equity on financial performance on SME in Malaysia	Ordinary least square method Sample size of 177 Malaysian SMEs	The study revealed that debt financing had positive and insignificant relationship To financial performance.	The study focused on debt financing and ignored various components of revenue streams as an option of financing.	The study focused on influence of revenue streams such as government grant, endowment trust funds, student fees and income generating activities.
Makanga (2015)	Impact of debt financing on financial performance of the firms listed in the Nairobi Stock Exchange	Quantitative research design and linear regression model	That short term loans had a negative association with return of asset.	The study was limited to firms listed in the Nairobi Stock Exchange which have different characteristics than institutions of higher learning	The study focused on public and private universities in Kenya and multiple regression model was used.
Mutiso, Onyango & Nyagol (2015)	Effects of funding sources on access to quality higher education in public universities in Kenya	Case study Interviews, questionnaires, document analysis and simple regression model	The study established that government capitation, tuition fee and other sources of revenue positively influenced the quality of education	The study employed case study to determine the effects of funding sources to access the quality of education in 10 universities in Kenya. The study ignored other financial factors	The study applied descriptive survey on all public and private universities in Kenya to assess the influence of financing options on financial sustainability, in addition to mediating and moderating factors.

Migin, Falahat, Yasid, & Khatibi, (2015)	Impact of Institutional characteristics on performance of private HEIs in Malaysia	Descriptive survey and structured questionnaires used to collect data	Institutional characteristics namely cost of academic, reputation, programs and facilities are significantly important in measuring students' choice of Malaysian	Institutional characteristics are used as independent variable on private HEIs	The study considered institutional characteristics as a moderating variable on all Kenyan universities
Murage & Onyuma (2015)	Financial performance of income generating activities in public institutions of higher learning: case of Egerton University.	Secondary data	Established that internally generated activities are a profitable source of income to fund PHLIs .	The study considered case study on only one public university	The study addressed both public and private universities
Mamo (2015)	Effects of revenue generation strategies in university finances in Sub Saharan African Universities.	Interviews, case study sample size was three universities	Internal revenue contributes more to university finances than did recurrent allocations from the government private HEIs.	The study was limited to revenue generation strategies and ignored other methods of raising finances such as debt financing	The study used panel data on 55 public universities in Kenya through census.

Ahmad, Soon & Ting (2015)	Income generating activities among academic staffs at Malaysian Public Universities	Qualitative approach, interviews and interactive model	The income generated through commercializing services are at upmost important to the development and sustainability of the university	The study was done in Malaysia and focused on only public universities and concentrated on income generating activities but ignored other contributing factors	The study concentrated on all financing options on both public and private Kenyan universities and factor in a moderating and mediating variable
Githaiga & Kabiru (2015)	Long-term debt and financial performance of SMEs in Kenya.	Secondary data, fixed effect model	The results portrayed a reverse relationship between long-term debt and financial performance of SMEs.	The study was limited to performance of SMEs	The study focused on financial sustainability of universities
Sazonov, Kharlamova1, Chekhovskaya1 & Polyanskaya (2015)	Financial sustainability of higher education institutions in Russia	Structured questionnaires and multiple regression, secondary data	Financial sustainability achieved where an institution generates sufficient income.	The study was done on HEIs in Russia and used secondary data only	Focused on financial sustainability of only Kenyan universities by using panel data, multiple and step wise regression

Webb, J (2015)	Effect of revenue diversification on financial sustainability of colleges and universities during tough economic conditions in the United States of America	Fixed effects model	Revenue diversification increases the total income per student and thereby improving financial outcomes in universities and colleges in the United States of America	The study ignored other financing options such as debt financing.	The study used debt financing as a financing option on financial sustainability and analyzed data by random effect model
Afriye (2015)	Factors that affect the financial sustainability of higher education learning institutions in Ghana.	Predictive effects model	Positive relationship between internally generate funds and growth of HEIs.	The study used predictive model only on all higher learning institutions in Ghana.	The study used random effects model correlation analysis and multilinear regression in Kenyan universities
Cheboi (2014)	Investigated the impact of donor funds on the performance of organizations in Kenyan government ministries.	Qualitative approach and multiple regression analysis.	Established that donor funds have a negative and insignificant association with financial performance	Used total debt in government ministries as a control variable	The study was carried out in the universities, used quantitative approach and considered moderating and mediating variables.

Lambe (2014)	Examined the effects of debt fund, capital mix and the firm value in Nigerian stock exchange	Secondary and primary data was used	The findings were that debt fund singling out long-term debt was significant and positively correlated to the value of firm	The study was based on debt fund and firm value in Nigerian stock exchange	The study focused on debt financing and financial sustainability of Kenyan universities
Tang (2014)	Effects of trade credit, from both supplier side and demand side on profitability of schools in Netherlands.	Descriptive statistics and sample size of 71 SMEs in Netherlands	The study found that trade credits (accounts payable) were positively associated to profitability.	The study was limited to schools in Netherlands and that it focused on trade credit as a source of financing	The study was done on public and private universities and focused on influence on various financing options on financial sustainability and used correlational and inferential statistics.
Estermann & Pruvot (2014)	Financial sustainability as a challenge facing European Universities	Secondary data was used and linear regression was used to analyze data	Universities with sound financial structures coupled with stable income are able to cope with challenges of un-sustainability	The study used concentrated on challenges of financial sustainability and overlooked other financial factors	The study considered financial sustainability being influence by financing options moderated and also mediated.
Teixeira, Rocha, Biscaia & Cardeso (2014)	Revenue diversification and financial performance moderated by institutional characteristics. Comparing the	Interviews, predictive model.	Enhancing relationship between revenue diversification and financial performance moderated by institutional characteristics.	The comparison was made between university and polytechnic sectors through Interviews.	The study compared public and private universities by analyses of panel data

	university and polytechnic sectors				
Pius (2014)	Effect of funding sources of higher education in Ghana	Primary data, ordinary least square method	The study found a positive and statistically significant relationship between funding sources and financial sustainability In Ghana	The study ignored mediating influence of institutional characteristics on the relationship between financing options and financial sustainability of universities	The study investigated the mediating influence of institutional characteristics on the relationship between financing options and financial sustainability of public and private universities
Mwangangi (2013)	Trade credit on the Performance of Non- financial companies listed at Nairobi Securities Exchange.	Panel data, sampling method	An inverse, insignificant correlation between trade credit and the value of firm	The study was limited to trade credit on the performance of Non- financial companies listed at NSE	The study focused private and public universities in Kenya
Maria & Bleotu (2013)	Modern trends in higher education funding in Europe.	Descriptive survey and primary data	The study found a significant influence of sources of finances on performance of higher education in Europe	The study was limited to funding of higher education instructions in Europe	The study focused on financing options of universities in Kenya
Ebaid (2013)	Capital structure choice of firms performance in Egypt,	Ordinary least square method and secondary data	Short-term loans had conflicting effect on MSEs financial performance that is negative, positive and	The study was limited on MSEs financial performance in Egypt	The study focused on financial sustainability of Kenyan universities

			no relationship with gross profit margin.		
Muchugia (2013)	Effect of debt financing and profitability of commercial banks in Kenya	Secondary data was collected and multiple regression analysis.	The study found that long-term loans had insignificant effects to profitability.	The study was carried out in commercial banks only which have different characteristics from those of universities	The study was done in the universities
Dube (2013)	Debt on profitability of SMEs in Zimbabwe.	Secondary data, random effect model.	The study revealed that long-term debt had positive relationship with firm value.	The study was done in SMEs on the effect of debt on profitability	The study was carried out in the universities on the influence of debt financing on financial sustainability

Appendix IV: Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **568503**

Date of Issue: **09/April/2020**

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