

**TRUSTEE BOARD CHARACTERISTICS, PORTFOLIO DIVERSIFICATION  
AND FINANCIAL PERFORMANCE OF UNIVERSITIES PENSION FUNDS  
IN KENYA**

**BY**

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## DECLARATION

### Declaration by Candidate

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## **DEDICATION**

This work is dedicated to my wife Jane, children Ivyonne, Roy, Lashawn and my brother Kamande for their enormous support in my academic pursuit. Special thanks to my cohort colleagues who always encouraged me to push on even when I was at the verge of giving up. The grace of God has always been sufficient.

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## ABSTRACT

The stewardship of retirement savings portfolios and their corresponding capital deployments is of global interest. The pension funds under the board of trustees have been reporting low assets to GDP ratio contribution as well as poor financial performance depicted by low and unpredictable return on assets especially in Kenya. The purpose of this study was to examine the mediating effect of portfolio diversification in the relationship between pension fund board characteristics and financial performance of Universities pension funds in Kenya. The study was guided by the following objectives to: assess the effects of board size; gender diversity, and financial expertise on financial performance; examine the effect of board size, gender diversity and financial expertise on portfolio diversification and; determine whether portfolio diversification mediates the relationship between board size, gender diversity and financial expertise and financial performance of Universities pension funds. The study was grounded on the Modern Portfolio Theory, Agency Theory and Stewardship Theory. A positivism research paradigm was adopted for this study. The research adopted an explanatory research design. Panel data from 26 university pension funds which met the inclusion criteria between 2015 and 2022 with a total of 208 observations were analyzed using both descriptive and inferential statistical techniques. Secondary data was sourced from the audited annual returns from the Retirement Benefits Authority by the Schemes trustees after whom document analysis was done. Prior studies have examined how board characteristics influence financial performance especially in the corporate world. However, there is limited research that has investigated whether this relationship operates through portfolio diversification and particularly within university pension funds. This study has addressed this gap by testing the mediating role of portfolio diversification on the financial performance of Universities Pension funds. “The study findings revealed that: board size had a positive effect on Financial performance ( $\beta = 0.1306$ ,  $\rho < 0.05$ ); gender diversity had a positive effect on financial performance ( $\beta = 0.1306$ ,  $\rho < 0.05$ ) and financial expertise had a positive effect on financial performance ( $\beta = 0.1123787$ ,  $\rho < 0.05$ ). On testing whether board characteristics under study had an effect on portfolio diversification (Mediator) the study findings indicated that: board size had a negative effect on portfolio diversification ( $\beta = -0.2879$ ,  $\rho < 0.05$ ); Gender diversity had negative but significant impact on portfolio diversification ( $\beta = -0.0259$ ,  $\rho < 0.05$  and financial expertise ( $\beta = 0.0122$ ,  $\rho < 0.05$ ), financial expertise had a positive and significant effect on portfolio diversification ( $\beta = 0.0981$ ,  $\rho < 0.05$ ). regression results for portfolio diversification on financial performance showed that portfolio diversification had a positive and significant effect on financial performance ( $\beta = 0.2654451$ ,  $\rho < 0.05$ ). Mediation analysis results revealed that: portfolio diversification does not mediate the relationship between board size and financial performance ( $Z = -0.636$ ); Portfolio diversification partially mediates the relationship between gender diversity and financial performance ( $Z = 3.213$ ) and portfolio diversification partially mediates the relationship between financial expertise and financial performance ( $Z = 2.880$ ). The study concluded that board size, gender diversity, and financial expertise significantly enhance the financial performance of university pension funds; financial expertise improves portfolio diversification; while gender diversity and board size showed mixed effects. Portfolio diversification positively influenced performance but partially mediated the effects of gender diversity and financial expertise. The study recommends that university pension funds ensure optimal board size, promote gender diversity, and prioritize financial expertise among trustees for better performance. Boards should also adopt strategic portfolio diversification aligned with fund objectives.

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**ACRONYMS**

AGM	-	Annual General Meeting
BOT	-	Board of Trustees
CEO	-	Chief Executive Officer
DB	-	Defined Benefit
DC	-	Defined Contribution
GDP	-	Gross domestic product
IOPS	-	International Organisation of Pension Schemes
NACOSTI	-	National Commission for Science, Technology and Innovation
NGO	-	Non Governmental Organisations
NHIF	-	National Hospital Insurance Fund
NSSF	-	National Social Security Fund
OECD	-	Organization for Economic Co-operation and Development
OVP	-	Orphans and Vulnerable Persons
PF	-	Pension Fund
PSSS	-	Public Service Superannuation Scheme
RBA	-	Retirement Benefit Authority
ROA	-	Return on Assets
ROE	-	Return on Equity
ROI	-	Return on Investments

## OPERATIONALIZATION OF TERMS

**Board size:** Board size is generally defined as the total count of individuals serving as directors on an organization's board within a specific annual reporting period (Maere et al., 2014, Routledge & Stewart, 2016)

**Financial expert:** This is an individual who possesses, through education and experience as a public accountant or auditor or a principal financial officer, comptroller, or principal accounting officer of an issuer, or from a position involving the performance of similar functions such as an understanding of generally accepted accounting principles and financial statements; experience in the preparation or auditing of financial statements of generally comparable issuers; and the application of such principles in connection with the accounting for estimates, accruals and reserves; experience with internal accounting controls; and an understanding of audit committee functions, (Sarbanes-Oxley Act, 2002).

**Financial Performance:** The extent to which business success is influenced by objectives are being or have been accomplished. It is the process of measuring the results of a firm's policies and operations in monetary terms. According to Naz et al (2016) financial performance shows the overall financial health of a firm and its ability in utilizing its resources to maximize the shareholders wealth and profitability.

**Fund Size:** This Fund size is depicted as the total assets held by the pension fund Chan et al (2004), Ahmad (2009) and Heenetigala, K. (2011)

**Gender diversity:** is the proportionate representation of men and women in the board

**Pension:** refers to a regular, recurring monetary disbursement or a form of annuity payment that is disbursed to an individual upon or subsequent to their retirement from active employment” (Eme and Sam, 2011)

**Pension Fund:** This describes a distinct collection of financial holdings that collectively constitute an autonomous legal entity. These assets are systematically acquired using the contributions made to a formal pension scheme. (OECD, 2005). The singular and dedicated objective behind the procurement and management of these holdings is the exclusive provision and funding of the promised benefits to be paid out under the pension plan.

**Portfolio Diversification:** This describes asset allocation, which encompasses the strategic distribution of an investment portfolio's capital across a variety of distinct investment categories and different industry sectors. This process involves segmenting assets into various classes, such as equities (company shares), real estate, cash, and fixed-income instruments like bonds. (Suva, 2019). The fundamental objective of this partitioning of investable funds across multiple asset classes is to intelligently diversify risk and optimize the potential for rewards, aiming for a balanced and resilient investment strategy.

**Trustee:** A trustee is an individual, or a collective body such as a business owner or a designated group of individuals, who bears the fiduciary responsibility for the meticulous management and administration of

the assets held within a trust. Their extensive duties encompass the careful oversight of various critical functions, including the processing of contributions, the execution of investment transactions, the preparation and analysis of financial statements, and the diligent management of all associated fees and expenses (ERISA 1973). RBA Act of 1997 elaborates on this definition, explicitly identifying a trustee as the trustee of a scheme fund and extending this classification to include any trust corporation, emphasizing their central role in safeguarding and guiding the financial resources under their charge.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.0 Chapter overview**

This chapter contains the following sections: background of the study; the statement of the problem; the objectives of the study; the hypothesis statements; significance of the study and the scope of the study.

#### **1.1 Background of the study**

Financial performance is the analytical procedure through which the success or failure of a firm's guiding policies and its various operational undertakings are accurately gauged. This measurement is explicitly conducted using monetary indicators, providing a clear financial snapshot of the company's achievements. The financial performance of a pension fund represents a nuanced, qualitative assessment of how skillfully and effectively a fund deploys its accumulated assets. The primary objective is to generate superior investment returns, thereby ensuring the adequate and timely provision of retirement benefits to its contributing members when they reach their retirement age. Naz et al. (2016) posit that financial performance clearly demonstrates the complete fiscal condition of a business enterprise. More specifically, financial performance showcases an organisations' capacity to skillfully manage and utilize its resources to achieve the twin goals of maximizing the value for its owners and improving its profit-generating ability. "University pension funds in Kenya fall into two categories, the public universities pension funds and the private universities pension funds. Some universities also operate Provident fund schemes or both. The public universities receive their funding from the government through the annual capitation. Through collective bargaining agreements between the public Universities

managements and the staff unions, the employer agrees to contribute a certain percentage of the basic pay and deposit it into the Pension fund. This portion is normally higher than the contribution that is made by the employee. The private universities get their funding from the fees that they charge their students. The universities whether public or private employ professionals of all kinds including lecturers who teach in different faculties and members of support staff. University employees in Kenya fall into two categories namely the academic staff and the non-academic staff. The employees contribute between 7.5% and 10% of the basic salary while the employer contributes between 15% and 20% of the employee's basic salary. The implication of this is that as the basic salary of the employee increases, the pension saving also increases. Pension schemes fundamentally exist in two primary configurations: those that are funded and those that are unfunded.

Within an unfunded system, often termed a "pay-as-you-go" arrangement, the concept of a pension fundamentally signifies a direct financial transfer. This transfer occurs from the contributions made by the currently employed segment of the population directly to the cohort of individuals who are presently in retirement. In essence, today's workers are financially supporting today's retirees.

Conversely, in a funded pension scheme, the active working demographic consistently remits contributions into a specially designated pension fund. This fund, over the course of an individual's working life – often referred to as the "accumulation phase" – actively invests these contributions. Through astute investment management, the value of these pooled assets is designed to appreciate significantly, continuing to grow until the point the contributor reaches retirement (Tonks, 2005). This approach builds a dedicated pool of capital specifically intended to cover future pension obligations.

In Kenya, the Public Universities Pension Funds are of the funded category as the government and the employer includes a pension component on the behalf of the employer. An employee's contribution is normally deducted from his or her salary. The universities pension funds in Kenya have suffered over the last couple of years due to non-remittance of the pension contributions of the workers. This has had a negative impact on the funds available for investment by the funds trustees. A 2018 audit report commissioned by the Ministry of Education showed that as at 30 June 2017, 26 universities had failed to remit a total of US\$48 million in pension funds (University World News, Africa Edition 17<sup>th</sup> May 2019).

Different jurisdictions have attempted to put up measures and legislation to mitigate the elderly people against harsh life after retirement. Omilola and Kaniki (2014) say that many African countries have put up social protection mechanisms in collaboration with development partners and larger international NGOs. These initiatives encompass a diverse array of provisions, including direct cash transfers and various forms of grants, which are strategically aimed at assisting all segments of the population identified as vulnerable. The programs also extend to public works initiatives, designed to offer employment opportunities, alongside subsidized microfinance and accessible financial services intended to empower individuals. Furthermore, they feature mechanisms like fee waivers, targeted subsidies, and various allowances, all contributing to a comprehensive social support framework (Omilola and Kaniki, (2014). Pension funds in Kenya are managed by several entities, including government-led schemes such as the National Social Security Fund (NSSF) and the Public Service Superannuation Scheme. (PSSS) and the Social Pension

Scheme which caters for people above 65 years; Occupational Pension Schemes also referred to as Umbrella schemes and Individual Retirement Benefit schemes (IRBS).

The pension schemes in Kenya amount to about Ksh.85.98 billion which accounts for 23% of the Gross Domestic Product (IOPS 2018). Since pension schemes are a major contributor to GDP growth, many governments are looking at building them so that their performance and stability can be improved. The prevalence of individuals engaging in funded and privately managed pension arrangements serves as a valuable metric for evaluating the overall reach and adoption of retirement savings schemes within a given nation. This indicator also sheds light on the number of people who are actively accumulating supplementary financial provisions for their post-employment years, exceeding the benefits they anticipate receiving from the public pension system.

Moreover, the extent of participation in funded and private pension programs directly influences the aggregate volume of pension assets held within a country's economy (OECD 2019). A broader base of coverage in these plans typically translates to a larger national pool of capital specifically earmarked for retirement, contributing to the country's financial depth and stability. According to Iskandar et al (2013), a director is considered a financial expert if they possess sufficient knowledge and experience in areas related to finance. Research has been done to establish whether directors and by extension trustees who are financial experts have an effect on the pension funds' financial performance (Chohan 2018, Carcello et al. 2002). Guner *et al* (2008) aver that financial experts significantly influence the financial and investment strategies of the firms they advise. They leverage their knowledge and experience to shape key decisions related to how firms raise, allocate, and manage their capital. In

their research focusing on companies in Malaysia, Johl et al. (2015) identified a statistically significant positive correlation between the level of accounting expertise within a firm and its financial performance. This suggests that the presence of skilled accounting professionals contributes to better financial outcomes for the companies. Wohlner (2013) defines investment diversification as a method used in portfolio management where different types of assets are combined with the aim of lowering the total risk associated with an investment portfolio. Suva (2019) explains that diversification is essentially a more formal term for the common wisdom, "Don't put all your eggs in one basket." He defines it as the strategic allocation of assets across different industry sectors, organizing investments into various classes such as equities (shares), property, cash, and fixed-income securities like bonds. This approach of splitting investable funds among multiple asset classes aims to help balance risk and potential rewards. Research has shown that diversification improves the financial performance of corporations Mungai and Elly, (2017), Lizares (2019), Museve et al (2016). The trustees of pension funds have been entrusted with the contributions of members so that they can invest them in investments that will give good returns. Pension funds invest across various asset classes, constantly seeking the optimal balance between achieving high returns and minimizing risk Pula *et al* (2011). Many countries have put legislation requiring pension funds to diversify their investments for example Kenya through the RBA Act and the Investment Policy Statement of 2015, Kosovo, South Africa, Nigeria, among others Kibet et al (2016).

Understanding the mechanisms through which board characteristics influence financial performance requires going beyond simple direct-effect models. In contemporary governance and financial research, mediation analysis has become a

central tool for identifying the intervening processes through which independent variables exert their influence on outcomes like financial performance. A mediator explains the how or why a relationship occurs by transmitting the effect of one variable to another (Baron & Kenny, 1986). In pension fund governance, this approach is especially relevant because the financial outcomes of funds result not only from board composition but also from strategic investment decisions made by trustees.

Mediation has been widely applied in social sciences to identify pathways involving organizational strategy, risk management practices, and investment actions (MacKinnon, 2008). Within the finance and investment domain, strategic decisions such as portfolio diversification often function as critical mechanisms linking governance attributes to performance (Markowitz, 1952; Pompian, 2016). For pension funds, trustees influence investment choices, risk tolerance, and allocation patterns, which then shape the fund's overall financial results (Indro et al., 1999). Thus, mediation analysis provides a rigorous framework to test whether governance characteristics—such as board size, gender diversity, or financial expertise—affect pension fund performance indirectly through diversification outcomes.

Recent literature further emphasizes that governance effects frequently operate through internal decision-making channels rather than solely through direct oversight roles (Preacher & Hayes, 2008; Hayes, 2013). In this context, variables like investment diversification may act as intermediate strategic processes that mediate governance influences. Although substantial research has explored the direct links between board characteristics and firm or fund performance, and separate studies examine diversification's effect on financial outcomes, there is limited empirical

evidence connecting these two strands within university pension funds—particularly in the Kenyan context, where governance structures and investment mandates differ across institutions.

Positioning portfolio diversification as a mediator therefore enables a more comprehensive examination of whether and how board characteristics translate into improved financial performance in university pension funds. This methodological approach not only deepens theoretical understanding but also addresses the identified gap in existing studies, which seldom test mediation relationships in pension fund governance models.

Though much research has been done on the impact of portfolio diversification on financial performance of corporations, and the effect of board characteristics on diversification there is little evidence of research done to show any connection between the board characteristics and diversification on pension fund's financial performance of Universities in Kenya. The researcher endeavors to examine whether portfolio diversification mediates between board characteristics and financial performance of pension funds of universities in Kenya.

## **1.2 Statement of the Problem**

Financial performance of pension funds has become a global concern due to the critical role these funds play in supporting retirees and sustaining social and economic wellbeing. Pension systems contribute significantly to national economies, with aggregated pension fund investments in OECD countries reaching USD 44.1 trillion in 2018 and exceeding USD 1.6 trillion in other jurisdictions (OECD, 2018). In Africa, South Africa and Namibia lead with pension fund assets surpassing 50% of their respective GDPs. These global trends underscore the importance of strong

governance structures and sound investment strategies to safeguard retirees' livelihoods.

In Kenya, pension assets have grown from under US\$1 billion in 2000 to approximately US\$13.24 billion by 2019 (Mutuku, 2020). However, the sector's performance remains weak, with pension assets representing only 12.9% of GDP compared to higher-performing economies (OECD, 2019). Despite this growth, several inefficiencies persist. Kenyan pension funds continue to rely heavily on traditional asset classes namely government securities, quoted equities, guaranteed funds, and limited real estate without adopting more diversified strategies (Mutuku, 2020; Tari, 2014). As a result, investment returns have declined; segregated schemes reported a drop from an average of 18.4% in 2017 to 5.2% in 2018 (Cytonn, 2019). Poor investment decisions, including placing funds in unstable financial institutions such as the collapsed Imperial Bank and Chase bank have further reduced returns and eroded members' contributions (Odundo, 2017). These inefficiencies have led to delayed pension payments, reduced benefits, and increased government expenditure on pension obligations, which rose to Ksh 86 billion in 2019 and was expected to reach Ksh 104 billion in 2020/2021 (Business Daily, 2019; East African, 2020).

University pension funds in Kenya face similar challenges. Financial reports indicate that some schemes struggle to meet obligations or provide adequate returns (Genesis Kenya, 2013; Njeru et al., 2015; Rono et al., 2010). Pensioners have experienced delayed payments and insufficient retirement income (Muriithi & Wamari, 2013; Walaba, 2014), while universities report declining employee retention linked to weaknesses in pension schemes (Mathula, 2018). Although several studies have examined pension fund financial performance in Kenya and internationally (Ruigrok

et al., 2007; Ngetich, 2011; Kimengich, 2015; Gitau & Muriithi, 2017; Ochieng et al., 2019; Kimeli & Wepukhulu, 2018), few have focused specifically on the financial performance of university pension funds, a subsector with unique governance structures and investment constraints.

At the governance level, Boards of Trustees play a critical role in investment decision-making. Board characteristics such as board size, gender diversity, and financial expertise shape strategic decisions that influence investment quality and fund performance. However, although research has examined the direct effect of these characteristics on financial performance, little is known about the mechanisms through which board characteristics affect financial outcomes. Portfolio diversification, which has been shown to influence financial performance in corporations and pension funds, has been treated in prior studies either as an independent or dependent variable (Mungai & Elly, 2017; Lizares, 2019; Museve et al., 2016). Very few studies have evaluated portfolio diversification as a mediating variable, particularly within university pension funds in Kenya.

This leaves a critical gap in understanding whether board composition influences financial performance directly or indirectly through investment diversification decisions. The absence of empirical evidence on this mediating mechanism undermines efforts to strengthen pension fund governance and optimize performance.

This study therefore seeks to bridge this gap by examining the relationship between board of trustee characteristics (board size, gender diversity, and financial expertise) and the financial performance of university pension funds in Kenya, using portfolio diversification as the mediating variable.

### **1.3 General Objective of the Study**

The main objective of this research was to examine the mediating effect of portfolio diversification on the relationship between Board of Trustees characteristics and financial performance of universities pension funds in Kenya.

#### **1.3.1 Specific Objectives of the Study**

1. To examine the effect of board of trustees' size on financial performance of Pension funds of Universities in Kenya
2. To assess the effect of gender diversity of the board of trustees on the financial performance of Pension funds of Universities in Kenya.
3. To determine the effect of financial expertise of the board of trustees' members on the financial performance of Pension funds of Universities in Kenya.
4. To evaluate the effect of board of trustee size on portfolio diversification of the pension funds of universities in Kenya
5. To establish the effect of gender diversity of the board of trustees on the portfolio diversification of the pension funds of universities in Kenya
6. To determine the effect of financial expertise on the portfolio diversification of the pension funds of universities in Kenya
7. To assess the effect of portfolio diversification on financial performance of pension funds of universities in Kenya.
- 8(a) to examine the mediating effect of portfolio diversification on the relationship between board of trustee size and financial performance of Pension funds of Universities in Kenya.

- 8(b) to examine the mediating effect of Portfolio diversification on the relationship between gender diversity of the board of trustees and financial performance of Universities pension funds in Kenya.
- 8(c) to examine the mediating effect of Portfolio diversification on the relationship between financial expertise of the board of trustees and financial performance of Universities pension funds in Kenya.

#### **1.4 Research Hypothesis**

The hypotheses of the study were as follows:

- H<sub>01</sub>:** Board of trustees' size has no significant effect on the financial performance of Pension funds of Universities in Kenya
- H<sub>02</sub>:** Gender diversity in the board of trustees has no significant effect on the financial performance of Pension funds of Universities in Kenya.
- H<sub>03</sub>:** Financial expertise of board of trustees has no significant effect on the financial performance of Pension funds of Universities in Kenya
- H<sub>04</sub>:** Board of trustee size has no significant effect on portfolio diversification of pension funds of universities in Kenya
- H<sub>05</sub>:** Gender diversity of the board of trustee has no significant effect on portfolio diversification of pension funds of universities in Kenya.
- H<sub>06</sub>:** Financial expertise has no significant effect on portfolio diversification of pension funds of universities in Kenya
- H<sub>07</sub>:** Portfolio diversification has no significant effect on the financial performance of Pension funds of Universities in Kenya

**H08a:** Portfolio Diversification does not mediate between board size and financial performance of pension funds of universities in Kenya

H08b: Portfolio Diversification does not mediate between board gender diversity and financial performance of pension funds of universities in Kenya

H08c: Portfolio Diversification does not mediate between financial expertise and financial performance of pension funds of universities in Kenya

### **1.5 Significance of the Study**

The research findings will help the government in formulating policies that will ensure that the objectives stated above are adequately met. The government makes huge annual budgetary allocations to meet its part of pension contribution into the different Public Universities sponsored pension schemes. The Private Universities equally provide huge amounts of money into their employees' pension funds. These contributions helps the government in meeting its cardinal responsibility of ensuring that the workers who have retired from active service are able to maintain an almost the same standard of living as when they were working.

The universities management is a major player in the Pension Schemes under their Jurisdiction because they are the sponsors. The collective bargaining agreements between the universities management and the workers unions provide that the universities will be contributing a certain percentage of the workers basic to the pension funds. The universities also have representatives in the board of trustees. The findings of this study could help the Universities Pension Funds managers and Trustees in making policies on the diversity inclusivity in their boards in order to

benefit from the advantages that accrue from the inclusion of diverse groups who have different characteristics in the boards of trustees.

The findings from the study will motivate the contributors to save more for retirement when they know that their interests after active service are well taken care of. Insurance companies are big stakeholders in the pension industry. They form part of the institutional investors who help in the management of some of the pension funds. The findings of this study could be helpful to them if called upon to enter into an agreement to run a scheme or manage assets on the behalf of a university pension fund.

IOPS, OECD and World Bank collaborate in collecting data and statistics on global trends on private pension funds. The findings from this study can help these organisations in acquiring the requisite data and information on the performance of universities pension funds in Kenya.

The RBA is the regulator established to set policies and oversee the growth of the Pension sector in Kenya. The findings from this study could help the regulator to set policies from an informed point of view. RBA would also have a mirror in which it can see how their policies are being implemented. It could also offer the baseline under which future policies could be formulated.

The Labour Unions represent the employees in many forums. The labour unions representing workers in the universities are UASU, KUSU and KUDHEIHA. Diverse representation in the management of the universities pension funds in Kenya will enhance the general outlook of the schemes and spur confidence among the

stakeholders. The findings from this study could go a long way in helping the stakeholders to improve their oversight role on the pension funds.

### **1.6 Scope of the study**

This study utilized panel data from the universities pension funds in Kenya, and covered duration of eight years from 2015 to 2022. The data was obtained from the retirement benefits authority (RBA) which provided comprehensive information for this timeframe. Notably, the period between 2000 and 2013 witnessed a significant growth in both public and private pension funds, driven by the expansion of higher education in Kenya through an increase in the number of universities. This period also marked the adoption of Kenya's new constitution in 2010, which placed a strong emphasis on promoting gender parity and enhancing access to education. Pension systems, as a broad field, encompass various sectors such as agriculture, energy, transport, and educational institutions. However, this study specifically concentrated on pension funds from public and private universities in Kenya, narrowing its scope to provide a focused analysis within the higher education sector. The study undertook to concentrate on the three board characteristics namely Board size, gender diversity and financial expertise because these three attributes are among the most theoretically and empirically grounded factors that influence organizational performance and governance effectiveness. Board size directly affects decision-making efficiency, coordination, and the diversity of perspectives. Agency theory and resource dependence theory suggest believe bigger boards offer more comprehensive knowledge and oversight, but may suffer from coordination issues, while smaller boards may be more cohesive but lack diversity. Gender diversity reflects the inclusivity and representativeness of the board, which can influence decision-making

quality, ethical behavior, and stakeholder perceptions. Trustees with financial expertise contribute directly to board effectiveness in financial oversight, audit quality, and strategic decision-making. Portfolio diversification serves as a concrete, actionable, and theoretically grounded bridge between board-level governance and financial outcomes. It captures how board decisions manifest in investment behavior, making it a compelling mediator in such studies. In spite of other variables that can be used as mediators like risk management practices, investment policy, or corporate governance quality, portfolio diversification is chosen because it is more measurable, directly linked to investment outcomes and it is well aligned with board-level decision-making.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

This chapter gives a review of the various aspects of pension funds. The chapter discusses the three concepts of board characteristics i.e. board size, number of women, and financial expertise of board members. The fourth variable is portfolio diversification as a mediator. The chapter will also discuss the theories used to support the research which are the agency theory, the resource dependence theory, the modern portfolio theory. The chapter also discusses the moderator exhibits the theoretical framework.

#### **2.1 Concept of Financial Performance**

The number of older people has been increasing over the years and research has shown that households with older people above sixty years are poorer than those without (Kwakwani and Subbarao, 2005). The percentage of the elderly population who are over 65 years was 12% in 1950, grew to 21% in 2000 and has been predicted to increase to 44% in 2050 (Ngetich 2012), Kumah et al (2017) contend that the world population has continued to grow as a result of a rapid growth in life expectancy. According to OECD (2020) the average life expectancy in the OECD countries between 2015 and 2020 was 78.1 years for men and 83.4 years for women. South Africa, which is the largest economy in Africa, has a life expectancy of 60.2 years for men and 67.1 years for women. Kirui (2014) contends that life expectancy in Kenya has been steadily rising. In 1963, life expectancy was 40years and by 2011, it was an average of 59.48 years (Kirui 2014). The average life expectancy in 2020 is 67.47 years according to Worldmeter (2020). Kirui (2014) contends that life

expectancy seems to be gender sensitive with women having a higher life expectancy than men. In terms of gender in Kenya, life expectancy is 69.87 years for ladies and 65.04 years for men (Worldmeter 2020). Generally, life expectancy for women is always higher than that of men. The growth in life expectancy has been as a result of improvement in medical care, high and better standards of living, migrations, better living conditions, increased educated citizenry among others. This increase in life expectancy has increased the cost and time allotted to the upkeep of the aged.

Didin et al. (2016) characterize financial performance as an organization's monetary standing across a specific timeframe. This refers to how well a company manages its finances, including how it obtains and uses money. Its effectiveness is measured by indicators like its ability to cover losses (capital adequacy), readily convert assets to cash (liquidity), manage debt (leverage), meet long-term obligations (solvency), and generate earnings (profitability). In essence, it shows how successfully financial goals are being achieved or are on track to be achieved. It involves quantifying the outcomes of a firm's operational techniques and policies in monetary terms, signifying the entity's proficiency in managing and overseeing its resources.

According to Isa et al. (2019), financial performance serves as a vital benchmark for gauging a firm's current health. This is because it illuminates the firm's operational efficiency and provides insight into its financial robustness, particularly concerning cash flow. Strong and favorable financial performance invariably bolsters the confidence of both investors and creditors in the firm's commercial activities and operations (Isa et al., 2019).

Pike and Roos (2004) articulate financial performance as a firm's capacity to operate effectively, generate profits, endure, expand, and adapt to both opportunities and challenges within its environment. Kamukama (2017) and Bititci et al. (2007) concur, asserting that financial performance is broadly accepted as a general metric for an organization's overall financial well-being over a given period. It can be utilized to facilitate comparisons between similar entities within the same industry or for aggregating comparisons across different industries or sectors.

Ultimately, financial performance offers insights into the business sector's outcomes and results for its stakeholders, aiding them in their decision-making processes. As Akwimba (2020) notes, it indicates how effectively an entity is deploying its resources to maximize shareholder wealth and profitability.

Understanding a pension fund's financial performance is important to the contributors because it helps them understand how their contributions are being managed. This in turn helps them have confidence that upon retirement their standard of living will be well taken care of. Didin et al. (2018) characterize financial performance as the monetary success a company attains within a given timeframe, which includes both acquiring and deploying financial resources. They measure this through metrics such as profitability, leverage, efficiency, solvency, liquidity, and capital sufficiency Bora (2008) more broadly states that financial performance reflects a business's capacity to generate more resources from its daily operations within a given timeframe. Pierre et al. (2009) argue that three components make up organizational performance with distinct outcomes namely: financial performance (including profits, Return on Equity (ROE), Return on Assets (ROA), Return on Investment (ROI), etc.); product market performance (such as sales and market share), and shareholder returns (like total

shareholder return and economic value added). Rowe et al (2009) assert that some researchers have adopted subjective view of financial performance by adopting informed responses.

The retirement benefits sector is crucial to any country's economy, with the financial performance of pension funds holding global significance due to their economic and social functions. Oluoch (2013) highlights that pension funds stimulate most nations' capital markets through financial intermediation, acting as both complements to capital market development and substitutes for banks by generating their own returns. These schemes manage substantial assets that, if effectively utilized, can significantly contribute to a nation's economic growth. Furthermore, Odira et al. (2020) state that pension systems boost the economy's savings rate and channel idle funds into the financial system, thereby ensuring efficient resource allocation. Another role played by pension schemes is to provide a retirement income to people who have moved out of active service. The assurance that an employee is able to receive an income when he is out of active service is motivation enough for one to save. Pension funds offer income security to retired workers or their beneficiaries in the event of incapacitation or death. Aliu et al. (2017) assert that these funds significantly impact both current and future generations, as the present generation bears a substantial responsibility for both past and future cohorts. Kibet et al. (2016) noted that pension funds also enhance the performance of life insurance firms when annuity products for pensioners are bought with pension funds. Furthermore, pension funds bolster financial markets as evident in numerous stock exchanges performance globally where pension schemes rank among the largest institutional investors. Upon retirement, a portion of the pension fund is typically paid out as a lump sum, with the remaining balance

distributed as periodic payments. Pension funds form a major part in financing retirees in all corners of the world and play a major role in the economic development of any country. Wanjala (2017) argues that Pension funds encourage the growth of capital and financial markets by both substituting for and complementing the roles of other financial organizations, especially investment and commercial banks. The pension fund industry has grown in leaps and bounds as governments have put in place measures to improve on the performance of the industry. In Kenya, the RBA has put in place initiatives and education to help people understand the importance of savings. These initiatives have seen the industry grow both in membership and contributions (Cyntons, 2019). The trustees of the pension funds are mandated to take charge of the contributions of members by investing them in viable investments that will bring in the highest returns. This will assure the members that upon retirement they will have something to push them through. Andonov et al. (2016), state that the fundamental characteristic shared by all pension funds is their obligation to deliver promised benefits to participants with the highest possible efficiency. The economic crisis of 2008 and part of 2009 affected negatively the performance of Pension Schemes and therefore brought in a sharp focus on the performance measurements. Antolín and Stewart (2009) reported that the Organisation for Economic Co-operation and Development (OECD) estimated significant financial setbacks for pension funds in its member countries in 2008. Specifically, these funds incurred losses amounting to approximately \$5.4 trillion in the aftermath of the financial crisis, which constituted roughly 20% of their total asset value across those nations. Hinz et al. (2010) investigated the key elements that affect pension funds' performance and identified several critical elements. These include the nominal short-term returns on assets, which reflect the immediate investment performance of the pension fund, as well as

administrative and investment management costs, which can significantly reduce net returns if not properly controlled. Additionally, the density of contributions referring to the frequency and consistency of contributions made by members was highlighted as an essential determinant. The study also emphasized the behavior of participants, particularly in relation to the age at which they choose to retire, as this affects both the accumulation phase and the payout duration of pension benefits.

Similarly, Nyangeri (2014) outlined other factors influencing the financial performance of pension funds identifying membership age, fund size, fund design, contribution density, fund value, and fund returns as critical. These factors collectively shape the financial sustainability and efficiency of pension schemes.

Extensive research has been conducted both in Kenya and internationally to explore the connection between pension features and the financial performance of these funds. Notable contributions include studies by Ruigrok et al. (2007), Ngetich (2011), Kimengich (2015), Gitau and Muriithi (2017), Ochieng et al. (2019), Kimeli and Wepukhulu (2018), Rono et al. (2010), Njuguna (2010), Cocco and Volpin (2006), and Temitope et al. (2018). These studies have examined various board characteristics like board size, gender diversity on the board, financial expertise, and trustee tenure and found mixed results. Research findings report a favorable relationship with financial performance while others indicate a negative impact, while some find no significant effect at all.

## **2.2 Concept of Board of trustee Characteristics**

Board characteristics encompass the diverse makeup of a board, including aspects such as gender, age, race, education, experience, nationality, lifestyle, culture, and religion, which are the elements that differentiate individuals (Mishra and Shital,

2012). Andonov et al. (2016) state that for a public pension fund, the board of administration is tasked with its management and control. According to Ferreira (2010) the board is the most important organ in an organisation because of the decisions they make like mergers and acquisitions and capital structure. Andonov (2016) pointed out that the board's duties extend to establishing employer contribution rates, deciding on the allocation of investment assets, conducting actuarial valuations, and performing other vital functions. Chohan (2018) stated that every autonomous pension fund should establish a board as its governing body, which is responsible for the fund's operation and oversight. Chohan (2018) elaborates that the board, functioning as the primary decision-making body, bears the overarching responsibility for a pension fund's strategic choices. This includes tasks such as establishing investment policies, choosing investment managers and platforms, selecting other service providers, and consistently evaluating the fund's performance. There has been increasing research interest on the relationship between board of trustee characteristics and the financial performance of boards of corporates and pension funds as well. Hsu and Wu (2014) link the increasing focus on the composition and traits of corporate boards to recent instances of corporate fraud, misconduct, negligence, and significant depletion of shareholder value, drawing particular attention to scandals within various multinational corporations. Isa et al. (2019) point out that many factors influence a firm's financial performance. These can be external, such as economic development and growth or political stability (Hosny, 2017), or internal, like a firm's liquidity (Omondi & Muturi, 2013). Liu, Miletkov, Wei, & Yang (2015) suggest that some firms assume boards of trustee characteristics have little influence on their financial performance.

However, the world has recently seen heightened interest in studying board characteristics and their effect on the financial performance of both firms and pension funds. Hsu and Wu (2014) emphasize that this interest has been driven by an increase in corporate fraud, misconduct, negligence, and significant losses of shareholder wealth, particularly in multinational corporate scandals. A specific area of interest has been the increasing number of women on boards. Much research in the recent past has been done about diversity in the boardroom and whether increased diversity has a direct effect on the financial performance of firms for example whether firms with higher diversity perform better than firms with lower diversity. Jhunjhunwala et al Mishra (2012), Nielsen et al Nielsen (2013) and Shital (2012) view board diversity as the varied composition of a board, considering aspects like gender, age, race, education, experience, nationality, lifestyle, culture, and religion, as these are the facets that differentiate individuals. In Africa, the informal sector is predominantly comprised of women and young people. For example, the estimated proportion of females in informal employment is 57% in Ghana, 65% in Benin, 58% in Malawi, and 53% in Namibia (Baah, 2007). The exclusion of the informal sector from pension arrangements effectively denies women and youth access to social security. This inadequate protection leaves women and youth vulnerable to unmitigated risks, often pushing them into poverty that persists throughout their working lives and into retirement. This has equally denied them the opportunity to participate in the management and protection of pension funds. To enhance and bring the informal sector into the pension system, the Retirement Benefits Authority (RBA) Act of Kenya initiated a pension education campaign dubbed “kulegalega” to compel Kenyans to come to realization of the need to save for old age (RBA 2016). The ultimate effect would be an improved economy as the returns on investments for both

the overall pension funds under management and individual pension schemes increase, it positively impacts the financial performance of those schemes (Njeru et al, 2015; Impavidoa, 2008; Zamuee, 2015; Rono et al, 2010; Van Horne et al, 2010; Zamuee, 2016).

Many countries around the world have passed legislation to compel companies and other organizations to increase the representation of women in their boards. Norway enacted a law requiring that 40% of a company's directors be women, a measure that went into full effect in 2008 (Rose, 2007). Similarly, Spain also passed a law mandating a quota for female representation on corporate boards (Adams & Ferreira, 2009). Singapore has included gender diversity in its code of governance. The Code dictates that boards ought to comprise directors who offer a "diversity" of skills, experience, gender, and knowledge of the company." However, this isn't a mandatory requirement (Nguyen 2018).

Italy enacted a law in 2012 mandating that corporate boards must include at least 1/5 women, a proportion that increased to 1/3 by 2015, as reported by Solimene et al. (2017). In 2010, the Netherlands signed a covenant aimed at increasing diversity in pension funds, where stakeholders committed to specifically addressing board diversity in terms of gender, age, and ethnic background among the pension fund's members, according to Swinkels (2012).

A report commissioned by the British Department of Trade and Industry, known as "The Higgs Report," suggests that demographic diversity enhances board effectiveness and recommends greater inclusion of women on boards (Adams & Ferreira, 2009). Hillman, Cannella, and Harris (2002) observe that a significant trend

in US boardrooms over the past two decades has seen an increase in the number of women and ethnic minorities. Despite these various legal efforts to improve gender diversity, Harper (2008) notes that there remains little, if any, unified regulation regarding the structure or composition of a public plan's board of trustees.

Numerous scholarly investigations have delved into the ramifications of gender diversity on the financial outcomes of companies, yielding varied conclusions. For instance, Ongore et al. (2015) identified a significant positive impact of gender diversity on the financial performance of corporations listed on the Nairobi Securities Exchange. Conversely, a study by Carter et al. (2010), which examined major US companies concerning the inclusion of women and ethnic minority directors on boards and their committees, did not establish a robust correlation between the gender or ethnic diversity of these governance bodies and the firms' financial performance. Furthermore, their research indicated that the relationship between board diversity (both gender and ethnic minority) and a firm's financial performance appeared to be endogenous, suggesting a complex, possibly reciprocal, interplay rather than a simple cause-and-effect. Simpson et al., (2010) suggest that the presence of more women can encourage more participative communication among board members. Reasons cited for including women on boards include their embodiment of a large pool of human capital available to an organization. Additionally, due to their often minority status on boards, they may act more as outsiders and be less beholden to management, thus serving as better monitors of managers. Gender diversity has also been found to enhance board monitoring. According to Hillman et al. (2002), having more women on the board improves the board's expertise by introducing a wider variety of professional backgrounds and a greater number of directors with advanced degrees.

Numerous studies have examined the impact of board characteristics on the financial performance of pension schemes, yielding mixed and often inconclusive results. Some research highlights the positive influence of specific attributes, such as financial expertise and gender diversity, on decision-making and investment outcomes (Chohan, 2018). In contrast, other studies suggest that certain board characteristics, such as large board size, may lead to inefficiencies and hinder performance due to challenges in coordination and decision-making (Johl et al., 2015). According to Nguyen (2020), there is no universally accepted consensus in the literature on whether board characteristics positively or negatively affect performance. This study focuses on three critical characteristics of pension boards of trustees namely board size, number of women trustees and financial expertise. These attributes are hypothesized to influence the governance, investment strategies, and overall financial health of university pension schemes in Kenya.

### **2.2.1 Board Size and financial performance**

Various researchers define board size as the total number of directors or trustees actively serving on a board in a given year, as noted by Maere et al. (2014) and Routledge & Stewart (2016). Similarly, Pugliese and Wenstop (2007) view it as the complete count of members possessing voting privileges within the board. Mwengei (2016) considers board size to be an important indicator, serving as a proxy for the diversity of knowledge and the extent of resources that the board can provide.

Fauzi & Locke (2012) assert that the magnitude of a board plays a crucial role in influencing a firm's monitoring and decision-making processes, thereby positively impacting its financial performance. Goel & Sharma (2020) elaborate, explaining that board size can affect the quality of decisions made, facilitate greater information

sharing, foster stronger connections with the external environment, and aid in the procurement of scarce assets. They also suggest that a larger board can lead to improved communication and coordination of issues, though it might also introduce higher free-rider obstacles and increased knowledge-sharing costs, potentially leading to less expression of individual notions and thoughts.

Research on how board size affects a company's financial performance has produced inconsistent findings, with some studies suggesting that larger boards are more effective. Proponents argue that expansive boards offer superior monitoring capabilities, provide a larger pool of information and experience, facilitate better networking opportunities, and allow for greater flexibility in scheduling committee meetings (Mohapatra, Pranati, 2017).

Gyapong et al. (2016) and Terjesen et al., (2015) contend that board diversity inherently promotes social equity and equal opportunities. A larger board is generally more likely to possess a broader array of skills, knowledge, and expertise, which can, in turn, enhance both its monitoring and servicing functions (Corbetta and Salvato, 2004). Consequently, appointing a diverse board helps in establishing a more all-encompassing and equitable business organisations that reflects the interests of existing stakeholders better (Terjesen & Sealy, 2016).

However, research also presents varied findings. For instance, in Australia, firms with larger board sizes were observed to have CEO compensation sensitive to the firm's size, but not directly to its performance (Nguyen et al., 2015). Brédart (2014) and Maere et al. (2014) support the notion of larger boards, arguing that they can counterbalance the influence of the CEO and enhance CEO oversight. As previously

mentioned, a larger board tends to have a broader range of skills, knowledge and experience contributing to its monitoring and servicing capabilities (Corbetta and Salvato, 2004). Yet, in Australia, firms with larger boards showed CEO compensation linked to firm size rather than firm performance (Nguyen et al., 2015).

Advocates for larger boards, such as Brédart (2014) and Maere et al. (2014), argue that a more expansive board can effectively counterbalance and even increase control over the influence of the CEO, thereby enhancing corporate governance. This perspective is further supported by Mohapatra and Pranati (2017), who contend that larger boards demonstrate greater effectiveness in several key areas. They often provide superior monitoring capabilities, offer a broader pool of diverse knowledge and expertise, facilitate better networking opportunities, and exhibit increased flexibility in scheduling committee meetings. These benefits collectively contribute to more robust oversight and strategic guidance for the organization.

However, other research suggests that firms might benefit more from smaller boards, citing concerns that large boards can become fertile ground for communication and coordination challenges that ultimately detract from a board's overall effectiveness. Ahmed et al. (2017) emphasize that a larger board inevitably leads to higher agency expenditures, and issues such as communication breakdowns and coordination difficulties become significantly more costly as the board's size increases. This sentiment is echoed by Mahesh et al. (2020), who found a negative and statistically insignificant relationship between board size and financial performance. Similarly, Kutum (2015) did not identify any discernible relationship between firm size and financial performance.

Contradictory findings further complicate the picture. Pathan and Faff (2013), along with Liang et al. (2013), observed that board size negatively affected bank performance. This stands in stark contrast to the conclusions drawn by Muttakin and Ulla (2012), whose study on Bangladeshi banks indicated that board size positively impacts financial performance. Muttakin and Ulla (2012) posit that larger boards are advantageous because they facilitate the integration of diversified knowledge and skills into the firm, ultimately contributing to the organization's operational excellence and overall success.

### **2.2.2 Board Gender Diversity and financial performance**

The concept of Board diversity has gained prominence among researchers in the recent past. Hafsi and Tugut (2013) contend that there is no generally accepted meaning of diversity. Diversity among board members, as defined by Hafsi and Tugut (2013), encompasses dissimilarities across various board characteristics. These quantifiable aspects of a board include its size, leadership structure, the presence of a founder-leader, the number of international directors, the nature of board committees, board independence, director ownership, tenure, and compensation. Erhardt et al. (2003) elaborate on board diversity, defining it as the differences among individual directors. They divide these dissimilarities into two types: directly observable characteristics like gender, age, and ethnicity (demographic dimensions), and less visible ones such as educational background and political ideology (cognitive dimensions), as also highlighted by Taljaard et al. (2014). Hirschman (1970) and Shi et al. (2016) emphasize that board diversity is crucial for fostering trust, particularly in a pension system where participants lack the option to exit, thus needing to feel that their voices are genuinely heard. Carter et al. (2007) advocate for board diversity,

arguing that a diverse board enhances the processing of information and advice, while also introducing new, unique, and valuable components to the information available to the board and management. Furthermore, a diverse board is instrumental in attracting and retaining talented female and minority managers and employees (Stephenson, 2004), which in turn enables organizations to tap into a broader talent pool.

The significance of gender diversity on boards has garnered significant scholarly interest in recent times. Mwengesi et al. (2016) define board gender diversity simply as the number of women on the board, while trustee board gender diversity specifically refers to the proportionate representation of men and women. Diepen (2015) highlights the importance of studying the relationship between gender diversity and a firm's performance, as this research can reveal the effectiveness of gender quotas. However, Diepen (2015) also points out that research finding on the relationship between gender diversity and the financial performance of different corporations have been inconsistent. This inconsistency underscores the need for further investigation to ascertain the specific effect of gender diversity on the pension funds of universities in Kenya.

Past research consistently shows that the value of women's contributions to boards cannot be underestimated. While companies might argue that board gender diversity lacks intrinsic value and prioritizing it could misalign with their incentives, a substantial body of research, including works by Cox & Blake (1991) and Robinson & Dechant (1997), demonstrates that women bring immense benefits to organizations. Moreover, a 2019 World Bank report illustrated the tangible economic benefits, stating that reducing gender inequality could boost the GDP per capita by over a

quarter in Niger by 2030 (World Bank, 2019). Cruickshank (2017) emphasizes the increasingly crucial role of corporate boards as organizations adapt to technological and societal changes. In this dynamic environment, a diverse range of perspectives and individuals will be essential to ensure boards thoroughly examine challenges from all possible angles. Across the globe, numerous countries have implemented legislation to compel corporate bodies to enhance the representation of women on their boards. For instance, Norway has a law mandating that 40% of a company's directors must be women (Rose, 2007). Spain has similarly passed a law requiring a quota for the number of female directors (Adams & Ferreira, 2009). Singapore has incorporated gender diversity into its code of governance, specifying that boards should include directors with a "diversity of skills, experience, gender, and knowledge of the company"; however, this remains a recommendation and is not a mandatory requirement (Nguyen, 2018). Italy passed a law in 2012 that requires corporate boards to comprise at least 1/5 women, a proportion that increased to 1/3 by 2015 (Solimene et al., 2017). Notably, Kenya's constitution includes a clause promoting gender parity.

The "Higgs Report" (2003), a study initiated by the British Department of Trade and Industry, indicated that demographic diversity enhances board effectiveness and advocated for more women to be included on company boards (Adams & Ferreira, 2009). Hillman, Cannella, and Harris (2002) highlighted that a significant trend in US boardrooms over the past two decades has observed a great shift towards the inclusion of more women and ethnic minorities. Mohammad et al. (2018) suggest that increased gender diversity on boards can enhance a firm's effectiveness by improving its understanding of stakeholder needs, subsequently leading to better risk management and overall business practices. They also propose that decision-making could be

enhanced through the introduction of new ideas and perspectives at board and executive management meetings. Extensive studies and research have been conducted on the effects of gender diversity on the financial performance of both pension funds and the broader corporate world. Ongore et al. (2015) discovered a notable relationship between gender diversity and the financial performance of companies listed on the Nairobi Securities Exchange. Kevin et al. (2008) observed that gender diversity positively affected firm value in Spain. However, in their study of major US corporations, Carter et al. (2010) found no strong connection between the gender or ethnic diversity of the board (or its key committees) and the financial performance of these companies. Their research further concluded that the gender and ethnic minority diversity of the board and a firm's financial performance appeared to be endogenous. Simpson et al. (2010) suggest that the presence of more female members may stimulate more participative communication among board members. A key reason for including women on boards is that they represent a large pool of human capital available to an organization. Furthermore, by virtue of often being a minority on the board, they may act more as outsiders, less beholden to management, and thus serve as more effective monitors of managers. Gyapong et al. (2016) argue that appointing women, ethnic minorities, and foreign nationals to corporate boards not only diversifies the board by introducing varied expertise, ideas, talents, skills, work ethics, backgrounds, and experiences, but also strengthens the board's independence and oversight capabilities. Gyapong et al. (2016) and Terjesen et al. (2015) emphasize that board diversity incorporates principles of societal justice and equal opportunities. Therefore, appointing a diverse board helps create more inclusive and equitable business organizations that better represent the interests and perspectives of their existing stakeholders (Terjesen & Sealy, 2016). Additionally, gender diversity has

been found to enhance monitoring by the board. According to Hillman et al. (2002), increasing the representation of women on a company's board improves the board's collective expertise by bringing in a wider array of professional backgrounds and a higher number of individuals with advanced degrees.

### **2.2.3 Financial expertise and financial performance**

A significant area of focus within board governance diversity is the professional expertise of the members of the board. The Sarbanes-Oxley Act of 2002 specifically defines a "financial expert" as an individual who, through a combination of education and practical experience, possesses a comprehensive understanding of generally accepted accounting principles (GAAP) and the nuances of financial statement preparation. Such an expert must also have hands-on experience in preparing or auditing financial statements, demonstrate expertise in applying complex accounting principles to estimates, accruals, and reserves, be familiar with internal accounting controls, and have a clear understanding of the functions of an audit committee. This very Act stipulates that at least one member of an audit committee must qualify as a financial expert. There is a broad agreement among experts that financial expertise significantly aids the board in diligently reviewing the financial reporting process, thereby ensuring the highest quality of financial reports. Moreover, the presence of accounting and financial expertise within the board of trustees is widely believed to enhance its overall efficiency and its capacity to detect and prevent potential financial losses effectively.

Such individuals bring critical skills necessary for effective oversight and governance, ensuring that financial reporting is accurate and reliable. Robert and Clifford (2004) further argue that a professional is characterized by affiliation with a professional

organization, adherence to a Code of Conduct and Ethics, and engagement with a body of knowledge supported by ongoing research activities. These attributes make it imperative for directors of firms, including pension fund boards, to possess relevant professional expertise. Professional expertise contributes significantly to ensuring accountability and enhancing financial performance. Guner et al. (2008) attribute numerous global financial scandals to the lack of financial expertise on corporate boards, emphasizing the necessity for financial and accounting experts to be included in board composition. They posit that board members with financial expertise influence the financial and investment policies of the firms they govern, fostering greater accountability and improving decision-making. Similarly, Hasyudeen (2003) highlights that financial literacy of board members enhances the credibility of an organization's financial position, positively impacting relationships with customers, banks, and regulatory authorities. This underscores the vital role of financial expertise in building stakeholder trust and confidence.

Empirical research corroborates the relationship between financial expertise and financial performance. For instance, A study conducted by Johl et al. (2015) focusing on firms in Malaysia revealed a statistically significant and positive relationship between the presence of accounting expertise on corporate boards and the financial performance of those companies. Their findings suggest that boards with higher financial acumen are better equipped to navigate complex financial issues, implement effective strategies, and achieve better outcomes. Similarly, Andonov et al. (2016) showed that pension funds overseen by boards with a greater proportion of trustees who possess substantial experience in asset management and financial matters tend to achieve superior returns, particularly from their private equity investments. This

suggests a direct correlation between specialized financial expertise on the board and the fund's investment success in less liquid, potentially higher-returning asset classes. These studies highlight the critical need for financial expertise in enhancing organizational performance and optimizing investment strategies.

In addition to expertise, age and gender have also been identified as important demographic factors influencing board effectiveness. Davydov et al. (2017) observed that age and gender significantly affect investor behavior and performance. Their study revealed that older investors, regardless of gender, traded more actively and exhibited better investment performance compared to younger investors. These findings suggest that a diverse board, inclusive of varied age groups and genders, may bring complementary perspectives and enhance decision-making. However, the study also underscores the importance of financial literacy and expertise as overriding factors in determining investment success, irrespective of demographic variables.

The relationship between financial expertise and experience is another area of focus in governance research. Carcello et al. (2002) discovered that greater levels of board expertise were associated with greater motivation to monitor organizational operations, leading to improved oversight and accountability. This aligns with findings by Alzoubi and Selamat (2012), who also reported that board expertise positively correlates with increased diligence in monitoring and governance activities. Conversely, Kutum (2015) presented contrasting findings, asserting that financial expertise alone does not significantly impact firm performance. This inconsistency in research outcomes suggests that the influence of financial expertise may be contingent on other contextual factors, such as the industry or organizational structure.

The concept of financial expertise is one of utmost importance when it comes to governance of pension funds. Andonov et al. (2016) highlighted that pension funds managed by trustees with substantial financial skills and asset management experience achieve superior performance. However, their study also identified a performance gap associated with participant-elected trustees, attributing underperformance to their lower levels of financial expertise. This finding underscores the importance of targeted training and capacity-building programs for trustees, ensuring that they possess the requisite skills to fulfill their fiduciary responsibilities effectively.

Diversification of expertise within a board is essential for mitigating risks and maximizing returns. Financial experts, in particular, contribute significantly to the formulation and execution of diversification strategies. Wohlner (2013) describes diversification as an investment approach that combines various assets to lower the overall risk of an investment portfolio. Research by Museve et al. (2016) and Lizares (2019) supports this view, indicating that diversified portfolios consistently outperform less diversified ones. Trustees with financial expertise are better positioned to evaluate and implement diversification strategies, balancing risk and reward to optimize fund performance.

Legislative frameworks in various countries emphasize the importance of financial expertise and diversification in pension fund governance. For instance, Kenya's Retirement Benefits Authority (RBA) Act and the Investment Policy Statement of 2015 mandate pension funds to diversify their investments across asset classes. This regulatory requirement underscores the need for trustees with the financial acumen to align investment strategies with legislative guidelines and market dynamics. Countries

such as South Africa, Nigeria, and Kosovo have implemented similar measures, reflecting a global consensus on the value of financial expertise in governance. In conclusion, professional expertise is a critical component of effective board governance. The presence of financially literate and experienced trustees enhances accountability, strategic decision-making and overall financial performance. While some studies present mixed results, the existence of evidence underscores the positive impact of financial expertise on organizational outcomes. As concerns pension funds, ensuring that trustees possess the requisite skills and knowledge is not just beneficial but essential for safeguarding the interests of members and achieving long-term sustainability.

### **2.3 Concept of Portfolio Diversification**

The concept of diversification was initially put forth by Harry Markowitz in 1952. Markowitz argued that an investor's primary objective should be to maximize their potential returns for any given degree of risk, and crucially, that this risk can be effectively mitigated through the creation of a diversified portfolio composed of assets that are not closely related. The core idea behind this theory is that investors are not bound to accept risk in its entirety but can manage it through the strategic selection and combination of investments. Markowitz emphasizes that diversification is essential because individual securities do not move in perfect tandem i.e. some go up while others go down, thus, the overall portfolio risk can be mitigated. He further states that any greater benefit carries some inherent risk. Investors must, therefore, understand that achieving better returns involves bearing some level of risk. It is important that a prudent investor would invest in different assets so as to reduce risk and attract higher returns. In real-world investing, it is almost impossible to eliminate

all risk, but by holding a diversified portfolio, investors can lower their exposure to asset-specific volatility and protect themselves from significant losses. This principle lies at the heart of modern investment practices, especially in institutional contexts such as pension fund management.

Varadarajan and Ramanujam (1987) characterized diversification as the degree to which companies operate concurrently across multiple distinct business segments. Their definition extends beyond financial assets into corporate strategy, where companies pursue different product lines, markets, or geographic regions to spread their risks and opportunities. By diversifying their operations, firms can potentially buffer themselves against downturns in a particular industry. Similarly, Iraya et al. (2018) contend that in the realm of investment, diversification is fundamentally understood as holding a carefully selected combination of assets whose performance is not positively correlated with one another. This strategic approach implies that should one asset in the portfolio experience a downturn or poor performance, the investor can be potentially compensated by the favorable performance of another asset within the same portfolio that moves in a different direction or remains stable. This inherent lack of positive correlation is important because it aims to mitigate overall portfolio risk by ensuring that a decline in one area doesn't necessarily translate to a decline across the entire investment. This concept is a cornerstone of modern portfolio theory; allowing investors to aim for a more consistent and stable return profile over time, even amidst market fluctuations. This risk-mitigating function of diversification is important especially for long-term institutional investors such as pension funds, which must ensure the stability and sustainability of returns for

retirees. A well-diversified portfolio serves as an insurance mechanism against unforeseen economic shocks or market volatility.

Modern Portfolio Theory (MPT), as introduced by Markowitz (1952), avers that every investment carries two distinct types of risk: systematic and unsystematic. Systematic risk also commonly known as market risk, is the inherent volatility affecting the entire capital market. This pervasive risk influences all securities to some degree and, critically, cannot be eliminated through diversification. Examples of systematic risk factors include shifts in interest rates, inflationary pressures, or major geopolitical events that impact the broader economic landscape. Conversely, unsystematic risk is specifically tied to the volatility of an individual security. This type of risk stems from unique factors related to a particular company, such as its management decisions, instances of product recalls, or internal operational issues. MPT suggests that investors have the ability to construct portfolios in a manner that allows the specific (unsystematic) risk borne by any single security within that portfolio to be effectively offset by the specific risk carried by another security, thereby reducing the overall idiosyncratic risk of the portfolio. The benefit of diversification becomes evident in this context, as combining different securities with different risk profiles leads to a lower overall risk exposure without necessarily sacrificing returns. Diversification is, therefore, an essential tool in constructing resilient portfolios capable of weathering various market conditions.

Diversification involves strategically distributing your investments across various assets to minimize your overall exposure to any single type of risk. This deliberate practice is intended to help reduce the fluctuations and instability in your investment portfolio over an extended period. By making investments across a variety of asset

classes, sectors, or geographic regions, investors aim to avoid the significant impact of a downturn in any one area. For instance, if an investor places all their capital in the technology sector and it experiences a sharp decline, the losses can be devastating. However, if that same investment is spread across various sectors like healthcare, finance, and consumer goods, the negative performance of one sector can be balanced by the positive performance of others. This balance is what makes diversification a critical principle in risk management. It is especially pertinent to institutional investors such as pension funds, which are tasked with safeguarding future income for retirees over decades.

According to Pula et al. (2012), any entity involved in investment activities is constantly striving to identify the most optimal investment opportunities. This pursuit entails acquiring assets that promise the highest possible returns while simultaneously presenting the lowest attainable level of risk. This quest defines the core challenge of portfolio management, where decisions must be made not only on potential returns but also on associated risks. Therefore, portfolio selection fundamentally involves the strategic and optimal allocation of financial securities across various asset classes. The primary objective of this careful distribution is to maximize the overall returns generated by the portfolio while simultaneously minimizing its inherent risk level, as explained by Aliu et al. (2017)). Investors, particularly institutional ones like pension funds or endowments, are tasked with undertaking a meticulous selection process. Investing involves strategically spreading money across various asset types, including stocks, bonds, real estate, and other alternative investments. The ultimate aim is to construct a portfolio mix that precisely aligns with their specific risk tolerance and overarching financial objectives. This strategic allocation is crucial for optimizing

returns while managing potential downsides in the dynamic investment landscape. Lizares (2019) asserts that diversification provides a firm with several strategic advantages. Firstly, it offers the potential to increase returns through growth by engaging in multiple ventures. Secondly, it allows for the spreading of risk by combining financial flows from uncorrelated businesses, which helps to absorb fluctuations in demand that might affect other segments. Diversifying a company's operations can boost shareholder value by allowing the firm to leverage shared resources and capabilities across different business units (economies of scope). This also enables the company to create efficient internal systems for allocating financial resources (internal capital markets) and managing its workforce (internal labor markets). These benefits are particularly attractive to pension fund managers, whose mandate is to grow the funds over time while minimizing risk to ensure that retirees receive their promised benefits.

Pension funds strategically allocate their capital across diverse investment classes. Their overarching objective, as highlighted by Pula et al. (2012), is a continuous endeavor to identify and pursue investment alternatives that promise the optimal combination of achieving high financial returns while simultaneously minimizing associated risks. Among the various justifications put forth for adopting a diversification strategy, several key roles stand out. As articulated by Matsusaka (2001), diversification often serves as a crucial survival tactic for firms, enabling them to weather economic downturns or challenges in specific market segments. It also functions as a dependable method to ensure a regular and consistent revenue stream throughout the entire year, smoothing out seasonal or cyclical fluctuations in particular industries.

Furthermore, diversification provides a means for corporations to actively search for a better alignment between their internal organizational capabilities and external industrial opportunities. This involves strategically exploring new ventures that may be a more optimal match for a company's existing strengths or resources. Lastly, and particularly in response to current declines in performance within core business areas, diversification acts as a powerful method that allows corporations to explore potential synergies across different operations and achieve better production efficiencies. This strategic expansion can revitalize a firm's overall performance and enhance its long-term viability by leveraging complementary assets and capabilities in new or existing markets.. This implies that diversification is not only a financial strategy but also a strategic response to market dynamics and organizational constraints. It enables institutions to remain competitive and financially viable under various economic scenarios. Diversification is an investment strategy implemented by constructing a portfolio of assets that are deliberately not concentrated within a single company, industry, geographical region, or asset class. This practice involves spreading investments across various distinct categories to minimize risk exposure to any one specific area. By selecting assets that are not closely related, the overall risk is reduced. This broad-based approach ensures that pension funds are not overexposed to a particular type of risk, whether it is sector-wise, geographic, or economic.

According to Purkayastha et al. (2012), a financial diversification can be understood through three main areas of focus: the risk reduction motive, the capital market failure argument, and the agency view. The risk reduction motive suggests that firms diversify their operations to decrease the overall variability in their organizational earnings. They achieve this by combining two or more businesses that generate

negatively correlated earnings streams. This way, if one segment faces a downturn, another might perform well, offsetting losses and stabilizing overall profits.

The capital market failure perspective argues that diversification allows firms to circumvent certain inefficiencies in external capital markets. By raising capital internally, companies can reduce transaction costs associated with external financing. Furthermore, they can more efficiently allocate resources between different divisions and exercise more effective monitoring and control over their operations. Lastly, the agency view considers the possibility that diversification might be influenced by managerial self-interest. This perspective suggests that managers might pursue diversification for personal gains, such as acquiring more power and prestige, securing better compensation packages, or reducing their own unemployment risk. Investment Strategy and Pension Funds Ngugi et al. (2018) emphasize that the investment strategy adopted by a board of trustees is fundamental in determining the mix of investments chosen to meet a pension scheme's specific risk and return objectives. The decisions around investment strategies in pension fund management are far more than just technical or financial considerations. They carry significant implications for the broader economy, influencing the development of capital markets, the funding of innovation, and long-term economic growth. Ngugi et al. (2018) further assert that the investment strategies of pension funds are crucial not only from the perspective of providing retirement income but also due to their substantial impact on the development of robust capital markets and the provision of essential capital for innovative enterprises.

Kamwaro (2013) highlights a significant correlation between a portfolio's financial performance and the magnitude of the investment held within it. This observation

lends credence to the assertion that diversification directly influences performance. Essentially, the scale of an investment within a diversified portfolio plays a crucial role in its overall financial outcome. This suggests that well-diversified, larger portfolios tend to yield better financial outcomes due to better risk management, access to a broader array of opportunities, and possibly lower transaction costs through economies of scale. Diversification helps an investor in getting higher returns by reducing the volatility in the market. According to the findings of Palich et al. (2000), Purkayastha et al. (2012), Teece (1980), and Wan et al. (2011), pursuing a diversification strategy can lead to superior firm performance when compared to a more focused approach. This is because diversification offers several key benefits: it provides the opportunity to increase returns through growth across various ventures; it allows firms to spread risk by combining financial flows from uncorrelated businesses, thereby absorbing fluctuations; and it can create shareholder value by leveraging economies of scale and fostering effective internal capital and labor markets.

Ihsan and Nihal (2013) posit that the outcomes of a firm's diversification efforts will not be uniform globally, as they are significantly influenced by the specific institutional environment in which the diversification takes place. Khanna and Palepu (2000) further explain that in emerging economies, greater diversification might not necessarily harm performance. This is attributed to the often insufficient market and institutional development in such regions. In these economies, diversification helps firms to establish internal markets that can prove more effective than the often inefficient external markets. This allows companies to gain advantages in both the range of their operations (scope) and their size/efficiency (scale) by taking on tasks

internally. These tasks would typically be handled by outside organizations or institutions in more developed economies (Ihsan and Nihal, 2013). Diversification, as an investment strategy, operates under several core assumptions: Firstly, it is presumed that investors are rational, meaning they behave logically and consistently in their financial decisions, aiming to maximize their utility or satisfaction given their available income or capital. Secondly, it's assumed that investors have free and unfettered access to fair and accurate information regarding potential returns and associated risks. This implies a level playing field where all market participants can obtain the necessary data to make informed choices. Thirdly, the underlying assumption is that markets are efficient, meaning they rapidly and perfectly absorb all available information, which is then reflected in asset prices. This means that it is difficult to consistently achieve above normal returns based on publicly available information. Finally, a fundamental assumption is that investors are inherently risk-averse. This means that when faced with two investments offering the same expected return, a rational investor will always choose the one with lower risk. Conversely, to accept a higher level of risk, investors require the prospect of a proportionately higher return. Thus, an important goal of diversification is to either maximize return for a specific level of risk or limit risk for a specific level of return. These assumptions are foundational to Modern Portfolio Theory and underpin the rationale for diversification. While real-world conditions may deviate from these ideal assumptions, they nonetheless provide a useful framework for understanding and applying investment principles, particularly in institutional contexts such as pension fund management.

According to Smits (2011), pension schemes have three dominant areas of investment, namely bonds, equities, and real estate. There is an increased growth in Defined Contribution (DC) schemes, and investment managers are advised to invest a substantial portion of funds in bonds (Smits, 2011). Bonds are seen as more stable, less volatile investment vehicles that provide regular interest payments and are therefore appropriate for ensuring predictable income for retirees. Brainard (2005) avers that investing pension funds on a reputable stock exchange is a worthwhile undertaking, especially in situations where the listed company intends to expand its business horizon. This can offer capital appreciation potential and dividend income. When constructing an investment portfolio, particularly for pension funds, the primary consideration must be the nature of the liabilities it is intended to cover. Subject to this crucial understanding, the overarching objective should then be to maximize the rate of return through investments that carry an acceptable level of risk. Oladapo (2016) further elaborates on this, stating that all contributions made by members to a pension fund are to be invested by the Pension Fund Administrators with the dual objectives of ensuring the safety of the capital and maintaining fair returns on the invested amounts.

In a Defined Benefit (DB) pension scheme, there is no direct correlation between the benefits promised to members and the actual returns generated by the investment portfolio. Consequently, it is argued that pension funds operating under a DB structure should aim to invest in a portfolio that precisely matches their liabilities. De Jong (2006) advocates for an investment portfolio consisting entirely of 100% long-term index-linked bonds to achieve this matching. However, in practical application, it is commonly observed that pension funds typically diversify their investments,

allocating approximately 40% to bonds and 60% to equities and real estate. Antolin et al. (2011) recommend investment in government bonds. Salou and Yerman (2012) contend that returns on government bonds are virtually risk-free and, more importantly, do not fluctuate as happens with returns on stocks or property.

These investments lead pension funds to incur both investment and administrative costs which significantly escalate the overall cost of retirement security (Bikker & Dreu, 2009). Research indicates a substantial impact and explains that a mere increase by 1% in the operating costs of pension fund assets can result in a 27% reduction in eventual pension benefits (Bikker & Dreu, 2009).

A study conducted on Dutch Pension schemes found that administrative costs are largely dependent on the size of the fund, rather than on the specific choices made in pension fund management or the design of the pension plan. These costs, like many others, are likely to increase less than proportionally due to the realization of economies of scale. Furthermore, past research has demonstrated that investment in bonds, shares, and real estate positively influence the financial performance of investment companies listed on the Nairobi Securities Exchange (Kimeu, 2015; Kamwaro, 2013). The Retirement Benefits Authority (RBA) has come up with a raft of guidelines that inform the investment undertakings of the pension funds in Kenya. These guidelines allow the trustees to invest the member's contributions in different portfolios that ensure a higher rate of return. The rules can be accessed through the RBA's website.

## **2.4 Theoretical review**

This section reviews the theories that underpin this research. Whereas there are so many theories that relate to aging and saving, the researcher will rely on three theories namely: the Modern Portfolio Theory, the agency theory and the Resource Dependence Theory,

### **2.4.1 Modern Portfolio Theory (MPT)**

This has been one of the theories widely used in making investment decisions. It was devised by Harry Markowitz in 1952. Harry Markowitz, who is often regarded as the "father of Modern Portfolio Theory (MPT)," fundamentally transformed the approach to constructing investment portfolios. He developed his influential concept based on two core foundational ideas: firstly, that an investor's primary objective is to maximize the potential return for any given level of risk they are willing to undertake; and secondly, that this inherent risk can be mitigated through the creation of a diversified portfolio of unrelated or minimally correlated assets. This approach emphasizes that returns and risks are intrinsically linked, and that sound portfolio construction can help manage this relationship more effectively. The theory asserts that it is not enough to simply seek out high-return assets; rather, it is essential to understand how different assets interact within a portfolio to optimize the risk-return trade-off.

Markowitz contends that risk is a natural component of any higher reward. That is, investors cannot completely avoid risk if they hope to achieve significant returns. Instead, the key lies in understanding and managing risk through informed decision-making. It is important that a prudent investor would invest in different assets so as to reduce risk and attract higher returns. By investing in a variety of asset classes, such

as stocks (equities), bonds, and real estate, investors can lessen the negative impact that significant price fluctuations in any single market sector or investment type might have on their overall portfolio. This strategy helps to spread risk because different asset classes tend to react differently to market conditions. For instance, if the equity market performs poorly, gains in fixed-income securities might compensate for losses, stabilizing the overall portfolio return. This central tenet of MPT remains vital in today's financial landscape, where global markets are more interconnected and volatile than ever.

According to Casault, Groen, and Linton (2013), the fundamental principle of Modern Portfolio Theory (MPT) dictates that investment assets should not be chosen solely based on their individual merits, such as their expected returns. Instead, the theory's core concern lies in quantifying how the return of each individual asset fluctuates not only in relation to other assets within the same portfolio but also in response to broader movements and overall fluctuations within the market. This interrelationship between assets measured through statistical correlations has a pivotal purpose for establishing the portfolio's overall risk. By selecting assets that do not move in the same direction, investors can achieve more stable returns. Casault et al. argue that understanding these correlations is fundamental to building a well-diversified portfolio that performs better over time, especially under volatile market conditions.

Mutula and Kagiri (2018) assert that when constructing a portfolio comprised of diverse individual stocks, the overall risk inherent in that portfolio shall be lower than the risk associated with having one single stock in isolation. Their research underscores the practical application of MPT in the real world, particularly in institutional investing contexts such as pension funds. Their study also observed a

significant connection between diversification decisions, management competency, investment strategies, regulation compliance, and the investment performance of pension funds in Kenya. This finding supports the view that effective diversification does not happen in isolation but that it is shaped by how well fund managers execute their investment strategy, adhere to regulations, and align decisions with their long-term performance objectives.

Bodie (2005) suggests that the theoretical justification for incorporating diverse asset classes, including traditional options like stocks and bonds, as well as other less conventional securities (alternative investments), into a portfolio is to enhance its overall risk and reward characteristics. The expectation is that these various assets will not only offer a higher absolute return individually but also contribute to improved portfolio diversification, thereby optimizing the balance between potential gains and risk exposure. Including diverse assets helps reduce exposure to risks that are specific to a single type of investment. Alternative investments may also provide access to non-traditional markets or instruments that behave differently from conventional securities, offering further diversification benefits. By improving the overall balance between risk and return, investors can meet their long-term goals more reliably.

The portfolio theory has been tested and proven to have been a game changer in matters of investment. For example, in his 2015 study, which examined how portfolio composition affected the financial performance of investment companies listed on the Nairobi Securities Exchange, Kimeu discovered a significant impact of portfolio composition on financial performance. His research specifically revealed that investments in bonds, real estate, and equity consistently exerted a positive influence

on the company's financial performance. These research outcomes strongly underscore the importance of using the principles of Modern Portfolio Theory (MPT) in practical, real-world portfolio management. This is especially relevant in developing markets such as Kenya where factors such as market volatility and a more limited array of investment options present unique and additional challenges for investors. Many jurisdictions have enacted laws to require pension schemes to diversify their investments. For instance, Zambia's investment guidelines (2011) stipulate that pension funds should not invest less than 5% and not more than 70% of their funds in equities. Similarly, Kenya has developed a policy framework allowing pension funds to invest up-to 10% in private equity, 20% in corporate bonds, and 30% in fixed deposits, among other asset classes. These regulatory measures are designed to ensure that pension fund managers adopt prudent and diversified investment strategies, reducing the risk of large-scale losses and enhancing long-term stability.

Paula et al. (2016) assert that pension funds invest in different classes of investments, always taking into consideration the need to find alternatives that offer high returns and low risk. They emphasize that many pension schemes are obligated by law to diversify their investments. It is an accepted principle that the positive effect of diversification enhances investment effectiveness by balancing return expectations with controlled risk. Effective diversification helps pension funds carry out their fiduciary obligation to safeguard contributors' assets as well as to ensure sustainability of future benefits.

Adejoh (2013) found that the risk profile of the invested portfolio has a great impact on pension fund management. Based on these findings, Adejoh recommends that fund managers should invest in less risky portfolios to preserve capital and ensure long-

term sustainability. This advice aligns with global best practices, which emphasize the importance of stability, especially for retirement savings. In line with this, the Retirement Benefits Authority (RBA) in Kenya has provided comprehensive guidelines on how investment managers ought to invest pension funds. These guidelines serve to promote transparency, accountability, and professionalism in pension fund management, ensuring that all investment decisions align with the principles of risk mitigation and long-term value creation.

#### **2.4.2 Agency Theory**

Jensen and Meckling (1976) explained a principal-agent relationship as “a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision-making authority to the agent.” This foundational definition underpins the entire body of agency theory, a framework widely applied in corporate governance, investment management, and economics. The core problem stems from the delegation of authority from the principal (e.g., shareholders or pension fund beneficiaries) to an agent (e.g., management or trustees). This delegation can lead to a situation where the agent makes decisions or takes actions that do not align with, or even contradict, the best interests of the principal. This divergence of interests is a central concern in agency theory, often requiring mechanisms to ensure the agent's accountability and alignment with the principal's objectives. In other words, the agent may prioritize decisions that benefit them personally, even if such decisions diverge from what would be most beneficial to the principal. This conflict of interest can lead to inefficiencies, losses, and a misalignment of strategic goals, especially if not properly managed or mitigated through sound governance structures. The concern is not

theoretical alone but has practical implications for many sectors, particularly in the financial and investment domains such as pension fund management, where the stakes for mismanagement are particularly high due to the fiduciary nature of the roles involved.

Taljaad et al. (2014) and Nguyen et al. (2012) highlight that agency theory prominently focuses on the crucial control function of the board. In this context, it specifically advocates for two key structural prescriptions: first, the board's autonomy from management, and second, a clear separation of leadership roles, particularly emphasizing the duality of the CEO and the chairman of the board. These recommendations have been formulated to mitigate potential conflicts of interest and to majorly improve on the board's oversight potential, operating under the premise that an independent board is inherently more inclined to work in the best interests of the shareholders or, in the case of pension funds, the beneficiaries' interests rather than rubber-stamping managerial decisions. The board's role becomes essential in monitoring and guiding executive actions, creating checks and balances that can mitigate the principal-agent problem. Without a clear separation of powers and roles, the management may consolidate power and make self-serving decisions. In many corporate governance frameworks globally, adherence to these agency theory principles is considered best practice. For pension funds, where trustees are the acting agents of the members (principals), ensuring independence and strong internal controls is key to safeguarding the fund's integrity and long-term viability.

In describing agency theory, Davis and Bryant (2012) characterized it thus: an organization's representatives, or agents such as its management who operate on behalf of the organization. However, given that the interests of these agents are never

entirely congruent with those of the organization they serve, they may find themselves in various situations marked by conflicts of interest. Consequently, these agents might be inclined to behave in a self-serving manner until appropriate controls including incentives are established to ensure their actions are aligned with the overarching organizational objectives. Agency theory therefore attempts to constrain agents from engaging in such acts of self-interest by offering incentives that encourage them to act appropriately. These incentives may take the form of performance-based bonuses, shareholding options, or promotions linked to the achievement of long-term organizational targets. The theory also supports the implementation of various control mechanisms such as audits, internal governance policies, and third-party evaluations. In the context of pension funds, this translates into ensuring that fund managers and trustees have clear, enforceable mandates and are accountable to the fund's members through transparent and regular reporting.

The business environment today is highly complex and dynamic, characterized by rapidly changing technologies, global interconnectivity, and evolving regulatory landscapes. In such a context, there isn't a single controlling mechanism that is optimal for every environment. Rather, a tailored mix of corporate governance instruments is necessary, specifically designed according to the nature of the firm, its shareholders, or the surrounding economic conditions (Claessens & Yurtoglu, 2013). Different organizations face different sets of agency problems, and the governance structures that work effectively for one firm may not be applicable to another. Therefore, best practice in governance now encourages firms to evaluate and design their control systems based on internal factors such as organizational culture and leadership style, as well as external factors like regulatory requirements and market

competition. Pension funds, for instance, require unique governance frameworks due to the fiduciary responsibilities involved and the long-term horizon of their investment activities.

Fund members and other creditors of a firm are typically limited in their access to information and are, therefore, unable to monitor the managers closely on a continuous basis. This lack of transparency opens the door for managers to engage in actions that might be detrimental to a firm's performance. This situation is exacerbated when shareholders are dispersed or not actively involved in governance. As a result, shareholders who are the principals must establish robust control and monitoring systems to ensure that managers, or agents, act in the company's interest rather than their own. Such systems may include performance audits, financial disclosures, mandatory reporting, and third-party reviews. Dewatripont et al. (1999) and Westphal et al. (2000) emphasize that the inclusion of women, much the same as external stakeholders, ethnic minorities, and foreign nationals, frequently introduce fresh perspectives when grappling with complex issues. This cognitive diversity can be instrumental in rectifying informational biases during the crucial processes of strategy formulation and problem-solving within an organization. Including women and other underrepresented groups on boards may improve oversight quality and decision-making, particularly when tackling complex investment and governance issues within pension funds.

The fund member or principal often does not have the time, experience, or expertise to administer a pension fund directly. Therefore, they mandate a professional manager or agent in order to conduct the pension fund's daily operations. The ultimate goal of this relationship is to achieve and sustain shareholder value over time. However,

managers and shareholders often have divergent objectives and priorities, giving rise to a permanent conflict between these two stakeholder categories (Dumitru, 2015). While shareholders may be concerned primarily with returns and risk mitigation, managers may focus on career advancement, compensation, or prestige. If unchecked, these differences can lead to inefficient resource allocation, risky ventures, or over-conservatism, depending on the agent's personal agenda. Therefore, well-structured governance systems, rooted in the principles of agency theory, are essential to mediate these competing interests and foster organizational alignment.

Mutuku (2014) asserts that in an agency relationship, it is crucial for the functions and duties of both principals and agents to be explicitly outlined. Principals are responsible for selecting and appointing governance officers, such as directors and auditors, to ensure that the organization has an efficient governance mechanism in place. Conversely, agents are tasked with managing the daily operations of the enterprise. The fundamental divergence in goals and motivations between the principal and the agent inevitably leads to the incurrence of agency costs. Jensen and Meckling (1976) famously categorized these agency costs into three distinct types: First are the monitoring expenditures by the principal, which include costs incurred in overseeing management actions, such as audit fees, compliance costs, or performance evaluation systems. Second are the bonding expenditures by the agent, which involve salaries, bonuses, stock options, or other forms of incentive offered to ensure managerial alignment with principal interests. Third is the residual loss, which comprises additional costs borne by the principal due to poor decisions made by agents that fail to enhance the firm's value. These costs are considered inevitable but can be minimized through effective governance structures.

Monitoring of managers is critical because they may misuse their positions by spending company money for their own benefit (Hart & Moore, 1990). For example, managers might pursue unnecessary expansion through acquisitions and mergers, not because such moves align with firm strategy, but because larger firms enhance their personal prestige and control (Jensen, 1988). Additionally, managers may invest in areas where they lack expertise or where potential benefits do not justify the high level of risk involved (Shleifer & Vishny, 1989). These behaviors can erode shareholder value and pose long-term threats to the sustainability of the enterprise. According to McColgan (2001), effective mechanisms for corporate governance can lessen agency costs. Such mechanisms include independent audit committees, performance-linked remuneration structures, transparent reporting systems, and regulatory oversight. These measures collectively help resolve ownership problems and enhance accountability.

When reviewing corporate governance practices in Africa, Okeahalam and Akinboade (2003) emphasize that governance frameworks should be tailored to fit the firm's specific environment. A one-size-fits-all approach is not practical, as different firms operate under varying legal, cultural, and market conditions. For instance, while Western models of governance emphasize shareholder activism and independent boards, such structures may not be entirely effective in African contexts without adaptation. Thus, governance reforms must consider local economic structures, institutional capacities, and stakeholder dynamics. Agency theory plays a central role in informing how managerial decisions impact outcomes, particularly in investment-focused institutions such as pension funds.

Within the structure of pension funds, the trustees serve as the agents, bearing the fiduciary responsibility to act solely and consistently for the welfare of the contributors, who are the principals in this relationship. The agency theory framework is directly applicable here, as trustees manage pooled contributions with the objective of securing optimal returns and safeguarding retirement income. A diverse pension board, incorporating members with different expertise, gender, and cultural perspectives, is better positioned to make sound investment decisions that bring higher returns. Such diversity also reduces the risk of groupthink and improves problem-solving capacity. Emanating from the discourse, it is evident that trustees, as agents of pension funds, hold the responsibility of minimizing pension-related costs and maximizing fund returns. This, in turn, ensures better outcomes for the plan members the ultimate principals in this relationship.

### **2.4.3 The Stewardship Theory**

This theory was advocated by Donaldson and Davis in 1991. The theory provides an important theoretical lens for understanding the governance of pension funds especially in contexts where trustees are expected to act in the best interests of members. The theory posits that organizational actors can behave as stewards whose motivations are aligned with the objectives of the principals (Donaldson & Davis, 1991). The stewardship theory argues that individuals often derive satisfaction from pro-organizational behaviours and will therefore act in ways that support the long-term success of the institution they serve (Davis, Schoorman & Donaldson, 1997). This perspective emphasizes trust, empowerment, collective responsibility, and long-term orientation as key drivers of decision-making.

The stewardship perspective is particularly relevant to pension funds because trustees are tasked with safeguarding members' retirement savings and are bound by fiduciary duties that require prudence, loyalty, and long-term value maximization. Scholars such as Tilba and Reisberg (2019) argue that pension trustees frequently adopt a stewardship identity, viewing themselves not merely as monitors of asset managers but as custodians responsible for the sustainability and growth of beneficiaries' assets. This identity motivates behaviours associated with prudent investment strategies, active oversight, and a commitment to long-term performance rather than short-term financial gains. In this regard, stewardship theory offers a compelling explanation for governance dynamics within pension funds, where trustees often prioritize stability, risk management, and intergenerational equity.

Applying stewardship theory to board characteristics provides a useful foundation for explaining how the composition of pension fund boards might influence investment outcomes. Board size, for instance, can influence the board's ability to act as an effective steward. A board that is too small may lack the range of expertise necessary to oversee complex investment decisions, while an excessively large board may face coordination challenges that undermine its effectiveness. Stewardship theory suggests that an optimally sized board is more likely to work cohesively, engage meaningfully in decision-making, and adopt long-term strategies such as prudent portfolio diversification (Donaldson & Davis, 1991). Thus, board size may indirectly influence financial performance through the quality of strategic investment decisions.

Gender diversity on pension fund boards also aligns well with stewardship principles. Diverse boards often bring broader perspectives, improved deliberation, and more balanced risk assessments, all of which support sound long-term decision-making.

From a stewardship standpoint, gender-diverse boards may be more inclined to prioritize stakeholder welfare, ethical considerations, and sustainable investment strategies. These attributes can translate into more prudent portfolio choices, including diversification decisions that help protect the fund from volatility and enhance long-term returns. Therefore, gender diversity may contribute to improved financial performance by promoting stewardship-oriented governance practices.

Financial expertise is another critical board attribute that strengthens stewardship within pension funds. Trustees with financial knowledge are better positioned to interpret market trends, evaluate investment risks, and guide asset-allocation strategies. Stewardship theory acknowledges that good intentions are insufficient without the competence required to act in the beneficiaries' best interests. Financially skilled trustees are thus more capable of translating stewardship motives into effective investment policies, including designing robust portfolio diversification strategies. This supports empirical findings that financial expertise enhances board effectiveness and contributes to the long-term financial performance of retirement schemes.

Portfolio diversification fits naturally within the stewardship framework as a mechanism through which trustee characteristics influence pension fund performance. Stewardship theory emphasizes long-term value protection, and diversification is a key tool for managing risk and enhancing sustainability. Trustees who view themselves as stewards are more likely to adopt and maintain diversification policies that reduce vulnerability to market fluctuations and ensure stable returns for members. As such, diversification can be conceptualized as a mediating mechanism linking board characteristics—such as expertise, diversity, and board capacity—to financial

outcomes. This theoretical logic supports empirical models that treat diversification as an intermediary through which governance quality affects performance.

Despite its strengths, stewardship theory also has limitations when applied to pension fund governance. The assumptions of pro-organizational behaviour and intrinsic motivation may not hold uniformly across all contexts. Tilba and Reisberg (2019) noted that the effectiveness of stewardship depends heavily on institutional factors, including trustee selection processes, regulatory environments, and organizational culture. In settings where trustees are politically appointed, inadequately trained, or disconnected from member interests, agency problems may persist, reducing the predictive power of stewardship. Furthermore, stewardship behaviours require adequate expertise; without the necessary skills, even well-intentioned trustees may fail to implement sound investment strategies. These limitations highlight the importance of contextualizing stewardship theory within broader governance frameworks.

Overall, stewardship theory provides a robust foundation for understanding how pension fund trustees influence investment strategies and financial outcomes. By emphasizing trust, competence, long-term orientation, and collective accountability, the theory illustrates why board characteristics such as size, gender diversity, and financial expertise matter for pension fund performance. It also helps explain why portfolio diversification operates as a central mechanism linking governance practices to financial results. For studies examining pension fund governance in emerging or developing contexts, stewardship theory offers a nuanced perspective that complements, and in some cases challenges, traditional agency-based explanations.

## **2.5 Empirical review**

This section reviewed existing research findings concerning the relationship between board characteristics and financial performance. The review specifically looked at past research findings of three board characteristics which were Board size, number of women in the board (gender diversity), and financial expertise of the Board of trustee. The research also looked into past research findings on portfolio diversification and its relation with financial performance of pension funds as well as its relationship with the mentioned board characteristics.

### **2.5.1 Board Size and financial Performance**

The definition of board size is the total number of individuals serving as directors on an organization's board (Bradbury et al., 2006; Jensen, 1993; Kent, Routledge & Stewart, 2016; Maere et al., 2014). This numerical aspect is recognized as a particularly critical element within the broader framework of corporate governance. Consequently, board size is frequently employed as a key variable in academic and professional studies that explore the effectiveness of boards and their influence on overall organizational performance. Its significance stems from the potential influence it can have on dynamics such as decision-making processes, oversight capabilities, and the breadth of expertise available to the organization. Board size is considered to have an influence on how effectively the board can discharge its duties, including strategic oversight, monitoring of executive performance, and ensuring that the firm remains aligned with its stakeholders' expectations. According to Maere et al. (2014), board size is precisely explained as the sum of the number of directors who are serving on a board in a specific year. This particular definition has been widely and consistently adopted within academic literature and empirical research that focuses on

corporate governance. Its precision allows for clear measurement and comparison in studies analyzing the composition and effectiveness of boards. Scholars such as Bradbury et al. (2006), Jensen (1993), and Kent, Routledge & Stewart (2016) have all utilized this operationalization of board size in their studies to investigate how it affects various aspects of organizational results, such as financial performance and governance practices. The concept of board size is not only structural but also strategic, as it determines the level of diversity, the breadth of experience, and the dynamics of decision-making within the boardroom.

The issue of board composition has elicited significant interest and research attention especially from the late 20th century to the present day. The escalating interest in board size stems from the increasing acknowledgment that corporate boards are pivotal in shaping a firm's strategic direction and influencing its financial performance. Recent corporate scandals and global financial crises have further intensified scrutiny on both the composition and size of boards, as stakeholders demand enhanced transparency and accountability. Corporate governance theory emphatically proposes that the very structure of a board encompassing its size, diversity (e.g., gender, expertise), and overall composition exerts a substantial influence on the behavior and strategic decisions made by top management. This theoretical perspective underpins much of the ongoing research into how board attributes impact organizational outcomes. These decisions, in turn, exert a profound impact on a firm's financial performance (Kim et al., 2009). The core argument posited is that a board, when structured effectively, possesses the capacity to significantly enhance the quality of its oversight functions, thereby reducing prevalent agency problems. This effective structuring also serves to ensure a robust alignment

between the management team's interests and those of the shareholders. In essence, a well-designed board acts as a critical mechanism for good governance, fostering accountability and promoting decisions that benefit the organization's long-term viability and worth to its owners. This line of thought has been further supported by research suggesting that the strategic insight and experience of board members can help navigate firms through complex business environments and improve their long-term sustainability.

The increasing focus on board composition is also driven by the perception that the makeup of a board and particularly its size can have a direct bearing on how well an organization performs. This belief has led to numerous empirical investigations into the relationship between size of the board and financial performance of a firm. Interestingly, the results of these studies have been mixed. Some scholars and practitioners argue in favor of larger boards, citing the potential for increased diversity of thought, broader access to expertise, and improved linkages with external stakeholders. Conversely, others advocate for smaller boards, arguing that they are more cohesive, more agile in decision-making, and better positioned to engage in meaningful discussions. For instance, Jensen (1993) and Yermack (1996) argue that as board size increases, the effectiveness of the board in carrying out its monitoring role tends to decrease. They suggest that larger boards can suffer from coordination problems, reduced accountability, and diluted decision-making, which hampers their ability to monitor executives effectively and make timely strategic decisions. Similarly, Lorsch et al. (1989) observed that as boards become larger, they tend to face agency problems, where individuals are more attracted to the prestige of the

position rather than the responsibility it entails. As a result, such boards become less effective in fulfilling their mandate of governance and oversight.

In contrast, resource dependence theory offers a different perspective by highlighting the benefits of larger and more diverse boards. According to Nguyen et al. (2012), an increase in board size can enhance a firm's ability to secure essential resources, improve legitimacy, and strengthen linkages with its external environment. From this viewpoint, larger boards can provide access to a broader network of relationships, varied industry knowledge, and increased strategic resources. This can be particularly valuable in volatile environments or industries where resource acquisition and legitimacy are critical for survival and success. A board with members from diverse backgrounds across gender, industry, and expertise can also facilitate better decision-making and foster innovation. Tijjani (2012) is a great proponent of larger board sizes. His study on the factors determining the financial sustainability of Pension Fund Administrators (PFAs) in Nigeria found that board size significantly influences the overall characteristics of the board.. His research specifically found that a larger board had a positive impact on the financial sustainability of pension funds. This finding supports the idea that a larger board, when managed effectively, can offer strategic advantages to organizations, particularly in highly regulated sectors like pensions where robust oversight, stringent compliance, and meticulous risk management are paramount.

Likewise, Ongore et al. (2015) carried out a study investigating the effects of board composition on the financial performance of firms listed on the Nairobi Securities Exchange. Their research surveyed forty-six companies listed in 2011, utilizing Return on Assets (ROA), Return on Equity (ROE), and Dividend Yield as key

indicators of firm performance. Contrary to Tijjani's findings, the results of their study revealed there was a negative correlation between board size and financial performance for these Kenyan-listed firms. This highlights the nuanced and context-dependent nature of the relationship between board size and financial outcomes. Nicely put, larger boards were associated with reduced firm performance, reinforcing the argument that smaller boards comprising around five to seven members are more effective. The study emphasized that smaller boards, when properly formed, can achieve ample diversity in terms of gender, skills, industry experience, and professional connections. This allows them to reap the benefits of diversity without suffering from the inefficiencies often associated with larger boards. The findings from Ongore et al. are consistent with much of the conceptual and empirical literature that advocates for an optimal, moderate board size that balances diversity with operational efficiency. Wayongah et al. (2019) also noted that firm size significantly influences the financial performance of non-bank financial institutions in Kenya, implying that governance variables like board size must be tailored to suit the nature and scale of the firm.

Sazali et al. (2009) conducted a study in Malaysia to explore how the size of multinational corporations (MNCs) influenced the relationship between knowledge characteristics and the extent of inter-firm technology transfer within international joint ventures. Their research included 128 joint venture companies registered in Malaysia. Employing multiple regression analysis, they discovered that the magnitude of the MNC significantly impacted the relationship's strength between specific knowledge characteristics namely, tacitness (how difficult knowledge is to articulate), specificity, intricacy, and implicit (unwritten, experiential) and explicit (codified,

documented) knowledge transfer. This suggests that the scale of a multinational corporation plays an important role in how effectively knowledge, particularly its more subtle forms, is transferred within cross-border partnerships. Notably, they discovered that compared to major MNCs, ties were stronger for medium and small MNCs, suggesting that firm size, and by extension board size, may also play a moderating role in organizational learning and innovation, particularly in knowledge-intensive sectors.

Similarly, Tangjitprom (2014) conducted research in Thailand to examine how the size of equity mutual funds influenced their performance. The study analyzed financial data from active mutual funds between 2006 and 2012. The study identified a significant relationship between fund size and performance. This suggests that, in the context of Thai equity mutual funds during that period, the fund's size played a discernible role in its performance outcomes. Intriguingly, this relationship was found to be quadratic in nature, meaning that while performance initially improved with size, it eventually declined beyond a certain threshold. The study found that the coefficient for fund size was positive, while the coefficient for the square of fund size was negative. This pattern suggests there's an optimal fund size: as a fund grows, performance initially benefits from economies of scale. However, beyond a certain point, the advantages of size are negated by increasing inefficiencies, leading to diminishing returns. These findings echo those of other studies in the corporate governance domain, reinforcing the idea that while size matters, bigger is not always better. There is a threshold beyond which the disadvantages of size such as bureaucracy, communication difficulties and coordination problems can hinder performance.

Oyedokun (2019) conducted research on the effect of board of director's characteristics on the financial performance of Nigerian banks listed on the Nigeria stock exchange. His investigation included board size and gender diversity. The overarching conclusion indicated that board characteristics significantly influence the financial performance of quoted commercial banks in Nigeria. To be precise, he found that board gender had a significant and positive effect on the financial performance of these Nigerian banks. His study, however, indicated that board size had an insignificant negative effect on the financial performance of Nigerian banks. This suggests that while larger boards were associated with a decline in financial performance, this trend was not statistically significant.

### **2.5.2 Gender Diversity and Financial Performance**

Mwengesi et al. (2016) defined gender diversity specifically as the number of women serving on a board. Woschkowiak (2018) noted that gender is the most extensively debated and researched type of diversity in academic literature, having also garnered significant attention from investors, politicians, media, and general society. This heightened focus is partly due to the increasing number of corporations globally that have implemented quotas concerning gender composition on their boards.

Extensive research has delved into the link between gender diversity and financial performance. Notably, Kanter (1977) suggested that changing the gender makeup of top management teams could significantly influence how organizations are structured. She contended that homogenous top management teams tend to cooperate more readily because social congruence fosters trust. In contrast, teams that exhibit diversity according to Kanter, require additional mechanisms to encourage cooperation. Where other modes of control are unavailable, trust becomes particularly

valuable. She also contended that during periods of significant uncertainty, companies tend to prioritize the uniformity of their management team over formal governance structures as a way to motivate performance.

Adams and Ferreira (2004) conducted research to empirically test Kanter's (1977) assertions. They based their study on a cross-sectional dataset of board of directors' information from 1024 publicly traded U.S. firms in fiscal year 1998 and the researchers made several observations. They noted that companies experiencing greater fluctuations in their stock returns generally had fewer women on their boards compared to men. Furthermore, they found that firms with a higher percentage of women on their boards tended to compensate directors more through restricted shares, lessen the emphasis on fixed salaries, and maintain a relatively stable proportion of stock options. In a finding which contrasts some of Kanter's initial ideas regarding cooperation and uncertainty, Ongore et al. (2015) conducted their own study (likely referring to the one mentioned earlier in the context of the Nairobi Securities Exchange firms) and found that gender diversity significantly improved financial performance.. This suggests that despite potential initial challenges in achieving cooperation in diverse teams, the benefits brought by varied perspectives can ultimately lead to superior financial outcomes.

Carter et al. (2010) examined how the gender and ethnic diversity of US company boards and their committees related to the financial performance of firms. Their study utilized data from firms within the S&P 500 index over a five-year period, from 1998 to 2002. As measures of performance, they employed both Tobin's Q and Return on Assets (ROA), which is commonly used in corporate governance research. In its original definition, Tobin's Q is determined by dividing the market value of a

company's assets by the cost to replace those assets. Return on Assets (ROA), in contrast, reflects a company's effectiveness in generating accounting-based revenue that surpasses actual expenses from its asset portfolio, with assets valued at their amortized historical costs. Their research specifically found a positive and significant relationship between both the number of women on the board and the number of ethnic minorities on the board, and ROA. However, when Tobin's Q was used as the indicator of financial performance, no significant relationship was observed with either gender diversity or ethnic minority diversity. This suggests that the perceived influence of diversity on financial performance can vary depending on the specific performance metric employed.

Francoeur et al. (2007) conducted a study titled "Gender Diversity in Corporate Governance and Top Management" to investigate if and how the inclusion of women on a company's board of directors and in senior management roles improves financial performance. They used a comprehensive dataset of women officers from the Financial Post's list of the 500 largest Canadian firms (FP500). To properly account for risk when comparing firm performance, they applied the Fama and French (1992, 1993) valuation framework. Their findings showed that companies operating in complex environments specifically achieved positive and significant abnormal returns when a large percentage of their officers were women. The conclusion drawn from their study was that firms with a significant proportion of women in both their management and governance systems generate sufficient value to at least keep pace with normal stock-market returns. This suggests that in challenging business environments, the diverse perspectives and approaches contributed by women in leadership roles can lead to superior financial outcomes.

Mohammad (2018) conducted a study on the effect of gender diversity on the financial performance of Jordanian banks from 2009 to 2016. Using a sample of 11 out of the 16 Jordanian banks listed on the Stock Exchange, an Ordinary Least Squares (OLS) multiple regression models were used to examine the impact of the percentage of women on boards of directors and in executive management on these banks' financial performance. The study concluded that there was no statistically significant relationship between the percentages of women on boards and in top and medium-level executive management of Jordanian banks and their financial performance. This particular finding differs from the results of numerous earlier studies, especially those conducted in Western nations, which have frequently indicated a significant positive correlation between the inclusion of women on boards and in executive roles and a company's financial performance. In a separate study, Tari (2014) investigated the Determinants of pension Scheme design in occupational defined contribution schemes in Kenya. This study found that women were an important element in the determination of the scheme design, but were, perhaps surprisingly, only associated with poorly performing schemes. This suggests a complex and potentially context-specific connection between results and gender diversity in the Kenyan pension fund landscape at the time of the study.

Cobus et al. (2014) carried out a research to determine whether increased board diversity enhances or diminishes the board performance of corporations. They gathered information about share returns and directors' demographic from a sample of the 40 largest companies listed on the Johannesburg Stock Exchange (JSE) from 2000 to 2013. The data was analyzed using Muller and Ward's (2013) investment style engine, by constructing portfolios of companies based on various board-diversity

constructs. The cumulative portfolio market returns were then analyzed using time series graphs to ascertain if the tested diversity dimensions were linked to increased company financial performance. From their study, it was established that racial diversity within the board did not improve the financial performance of the firms. However, it was observed that increased gender diversity, particularly when coupled with young age, showed a strong association with improved share performance.

Similarly, Garba and Abubakar (2014) carried out a study on the impact of corporate board diversity on financial performance of insurance companies in Nigeria. The study specifically investigated the impact of gender diversity, ethnic diversity, board size, board composition, and foreign directorship on the financial performance of 12 insurance companies listed on the Nigerian Stock Exchange. Data was collected over a six-year period, from 2004 to 2009. The findings showed a positive influence of gender diversity on the financial performance of these insurance companies. Conversely, the study identified a negative and significant relationship between board composition and the performance of insurance companies in Nigeria. The study concluded that an increase in the number of female directors will enhance the financial performance of the insurance companies in Nigeria.

Ombaba (2016) conducted a study in Kenya on board diversity and financial performance, focusing on companies listed on the Nairobi Securities Exchange between 2004 and 2014. This research explored how various board characteristics: independent directors, board size, gender representation and the financial expertise of directors influence firm performance. The study observed that female representation on boards remained low. Interestingly, it also found a negative and significant

relationship between board independence and firm performance. These findings align with the results of many previous studies.

Nguyen (2018) investigated the connections between board gender diversity, corporate governance, and their impact on financial performance within companies listed in Singapore. The study utilized Return on Assets (ROA) and Tobin's Q as measures of financial performance and also explored the relationship between board gender diversity and corporate governance scores. Using an Ordinary Least Squares (OLS) regression model, the research examined how these variables related to financial performance. The findings revealed that the corporate governance score had a positive and statistically significant effect on financial performance. This suggests that board gender diversity influences financial performance indirectly, by first impacting corporate governance scores. Additionally, the study found a positive and statistically significant impact of the proportion of female independent directors on Tobin's Q. This outcome supports the recommendation for companies to increase female representation on their boards, especially independent female directors, as this appears to lead to enhanced corporate governance and, consequently, improved financial performance.

Fariha et al. (2021) carried out a research on the relationship between board characteristics and commercial banks listed on the Dhaka Stock Exchange (DSE) in Bangladesh, covering the period between 2011 and 2017. A Pooled OLS model was used for their regression analysis. Among the characteristics examined were board size and gender diversity. The study found that board diversity had a negative and significant relationship with both Return on Assets (ROA) and Return on Equity

(ROE). This indicated that an increase in board diversity, in this context, led to increased inefficiencies.

Similarly, Hosny K. and Elgharbawy A. (2022) carried out a study on the relationship between board diversity and financial performance for companies trading on the FTSE 350 between 2013 and 2019. Among the diversity attributes under study was gender diversity. The study results revealed that gender diversity of executive directors negatively affects market-based performance.

### **2.5.3 Financial expertise and financial performance**

Sarwar et al. (2018) define expertise as skillfulness acquired by virtue of possessing specialized knowledge in a particular area. This definition underscores the importance of not just having knowledge, but having applied and practiced that knowledge to a point of distinction. In the context of financial governance, a financial expert is then defined as a person who has relevant experience in accounting or finance, or someone who has held supervisory roles that involve financial decision-making and oversight (Sarwar et al., 2018). Such expertise is particularly significant in institutional financial settings such as pension fund management, where the financial health of contributors which often spans decades depends heavily on the competency of those entrusted with making investment decisions. The importance of financial expertise becomes even more pronounced considering that trustees bear the critical responsibility of overseeing and investing employees' contributions. Their fiduciary duty entails making sound investment decisions that will yield maximum returns for the long-term benefit of the contributors. Consequently, expertise in financial matters is not a peripheral requirement but a central criterion in the selection of fund trustees, as it

directly correlates with the fund's ability to achieve sustainable growth and security of assets under management.

Research findings on professional expertise indicate that studies often narrow their focus to one specific domain of professionalism, such as legal, banking, accounting, or political backgrounds. This segmentation, while insightful, may limit a more holistic understanding of how different forms of expertise interact within a boardroom or trustee setting. Jensen (1993) and Klein (1998) argue that boards formed of directors from diverse commercial and socio-economic backgrounds bring a wider range of perspectives to their roles in both oversight and providing advice. This diversity enhances their problem-solving capabilities, strategic thinking, and resource utilization, ultimately delivering greater satisfaction to business owners and stakeholders. From this perspective, it is clear that professional diversity, particularly when it includes financial expertise, allows for robust governance practices. Directors with differing expertise can challenge assumptions, contribute varied strategic insights, and mitigate groupthink factors that are invaluable in complex financial decision-making environments. Financial experts, specifically, bring to the table the ability to scrutinize financial statements, assess investment risk, and ensure compliance with financial regulations, which are all crucial competencies for the effective governance of institutional funds like pensions.

Defond, et al. (2005) further highlight the market's favorable response to the appointment of directors who possess financial expertise. This is largely because such individuals are seen as capable of contributing meaningfully to the audit committee, a major organ of the board that is charged with the duty of ensuring the integrity of financial reporting and internal controls. Investors and other stakeholders view the

presence of financial experts as a signal of strong governance and a safeguard against financial mismanagement or misreporting. Consequently, firms often experience an increase in market value following the appointment of such individuals to their boards. The confidence in financial experts is rooted in their ability to analyze complex financial issues, provide strategic financial oversight, and enhance the credibility of the board's financial governance. This perception strengthens corporate transparency and accountability, which are key pillars in good governance practices.

Ruigrok et al. (2007) performed comprehensive research in Switzerland to establish how various board members attributes, including nationality, gender, level of independence, multiple directorships, and educational background, interact to influence board dynamics. One of the key findings from the study related to education and expertise was that women directors in Switzerland were more likely to possess degrees in fields other than business, and they were also more likely to serve as outside directors. This observation challenges the often-held assumption that financial or business qualifications dominate board composition. The study's findings contrast with earlier research by Burke (1997) and Hillman et al. (2002), which revealed that in North America, women directors tend to hold more advanced degrees, particularly in business and related fields. The discrepancy in findings was attributed to cultural and structural differences in business formation. In Switzerland, many businesses are family-owned, and directorship is frequently a role reserved for family members, potentially leading to a narrower field of professional diversity. This structural difference may limit the appointment of directors based on merit or professional expertise, especially for women, and can have broader implications for board performance and governance outcomes.

The importance of financial expertise on pension fund boards is further emphasized in a study by Andonov et al. (2016), which investigated pension fund board composition and its influence on investment performance, particularly in private equity. One of the key findings from the study was that a lack of financial experience among board members, especially participant-elected ones, significantly contributed to poor investment performance. This finding is particularly concerning given the growing complexity of pension fund investments, which increasingly involve alternative assets like private equity, real estate, and infrastructure. The study also brings into focus the challenges posed by having well-meaning but financially inexperienced individuals serving on boards, where their lack of technical knowledge may hinder effective decision-making or lead to suboptimal investment strategies. This is especially critical at a time when the number of women attaining higher education and gaining professional experience continues to rise Solimene et al., (2017). As such, institutions must be more deliberate in leveraging this growing pool of talent by ensuring that individuals with both the right qualifications and practical experience are given opportunities to serve in governance roles.

Stephen and John (2014) add another layer to the discussion by noting that enterprises that limit their board diversity to a narrow band of professional expertise may unintentionally curtail the benefits that come with a well-rounded and experienced board. While specialization is important, especially in areas like finance and accounting, over-reliance on a single discipline may lead to a myopic view of organizational challenges and solutions. A diversified board that includes financial experts as well as professionals from other fields such as law, economics, technology, and human resources can provide a more comprehensive approach to governance. The

blend of different professional experiences fosters a more dynamic and informed decision-making environment, enhancing the overall effectiveness of the board. Finally, Defond et al. (2005), through their additional research, strengthen the argument that the stock market responds favorably to the engagement of board members possessing financial expertise. This positive market reaction is particularly pronounced when these financially astute individuals are anticipated to serve on the audit committee. The ability to scrutinize financial data, ensure adherence to reporting standards, and provide strategic oversight makes such individuals invaluable assets to any board, especially in complex financial contexts like pension fund management.

## **2.6 Portfolio diversification and financial performance**

Mutula A. and Kagiri A. (2018) carried out research on the “*Determinants Influencing Pension Fund Investment Performance in Kenya*”. The core aim of their research was to explore the diverse factors affecting the success or failure of pension fund investments specifically within Kenya. To achieve this, the researchers employed a census approach, focusing on all 33 pension schemes registered in Kenya. From these schemes, they incorporated the views and insights of 66 senior managers who play a direct role in making investment decisions. These managers are key stakeholders, as their expertise, judgment, and oversight significantly influence how pension funds are managed and invested. Data was gathered through structured questionnaires designed to collect primary information regarding investment behavior, strategy formulation, and regulatory compliance. After collecting and analyzing the data, the researchers concluded that several factors had a statistically significant and positive effect on the investment performance of pension funds. These factors include the effectiveness of diversification decisions, the competency of the management teams, the strategic

approaches employed in making investments, and the degree to which pension schemes comply with regulatory frameworks. This finding implies that well-diversified investment portfolios, coupled with strong managerial expertise and adherence to regulatory standards, are more likely to yield higher returns for pension funds in Kenya. Furthermore, the study also reinforces the idea that organizational characteristics, such as governance structures and investment planning, are crucial in enhancing financial performance and ensuring the long-term sustainability of pension schemes.

Museve et al. (2016) conducted a study that complements these findings by exploring how board characteristics, particularly gender diversity, affect diversification. They established that gender diversity on boards has a direct effect on diversification, using sales as a measure of diversification outcomes. This suggests that having a more diverse board may introduce a broad array of perspectives and risk appetites, which in turn could influence how investment portfolios are constructed and managed. The presence of women in strategic decision-making roles may contribute to broader thinking in investment choices, ultimately leading to better diversification.

Iraya et al. (2018) conducted research to determine whether portfolio diversification affects the financial outcomes of mutual funds in Kenya. The study used a sample of seven selected mutual funds for the year 2013, drawing secondary data from the Capital Markets Authority (CMA) and each mutual fund under study. The researchers calculated portfolio returns by analyzing changes in the prices of balanced funds traded on the Nairobi Securities Exchange (NSE). Diversification was assessed by examining the level of unsystematic risk associated with the performance of the funds. Control variables included fund size and the age of the mutual funds. Using

regression analysis, the study revealed a positive correlation between unsystematic risk and the financial performance of mutual funds. Interestingly, the findings suggest that lower levels of diversification which result in higher unsystematic risk were associated with higher financial returns. This implies that mutual funds taking on more concentrated positions may achieve greater profitability, though potentially at higher levels of risk. The study highlights the nuanced relationship between diversification and performance, suggesting that, in certain contexts, limited diversification may not necessarily hinder and may even enhance financial outcomes.

## **2.7 Control Variables**

According to Kirui (2014), a control variable is a factor that remains constant and significantly affects outcomes. It's kept unchanged in an experiment to accurately measure the impact of an independent variable. Essentially, it's a variable which is controlled or accounted for due to its potential influence on the dependent variable. In this study, Pension fund size and f age were selected as control variables specifically because of their known effect on the financial performance of pension funds. This indicates an acknowledgment that while primary independent variables are being investigated, the impact of fund size and age also needs to be isolated or accounted for to ensure more accurate results regarding other relationships

### **2.7.1 Fund size and fund age**

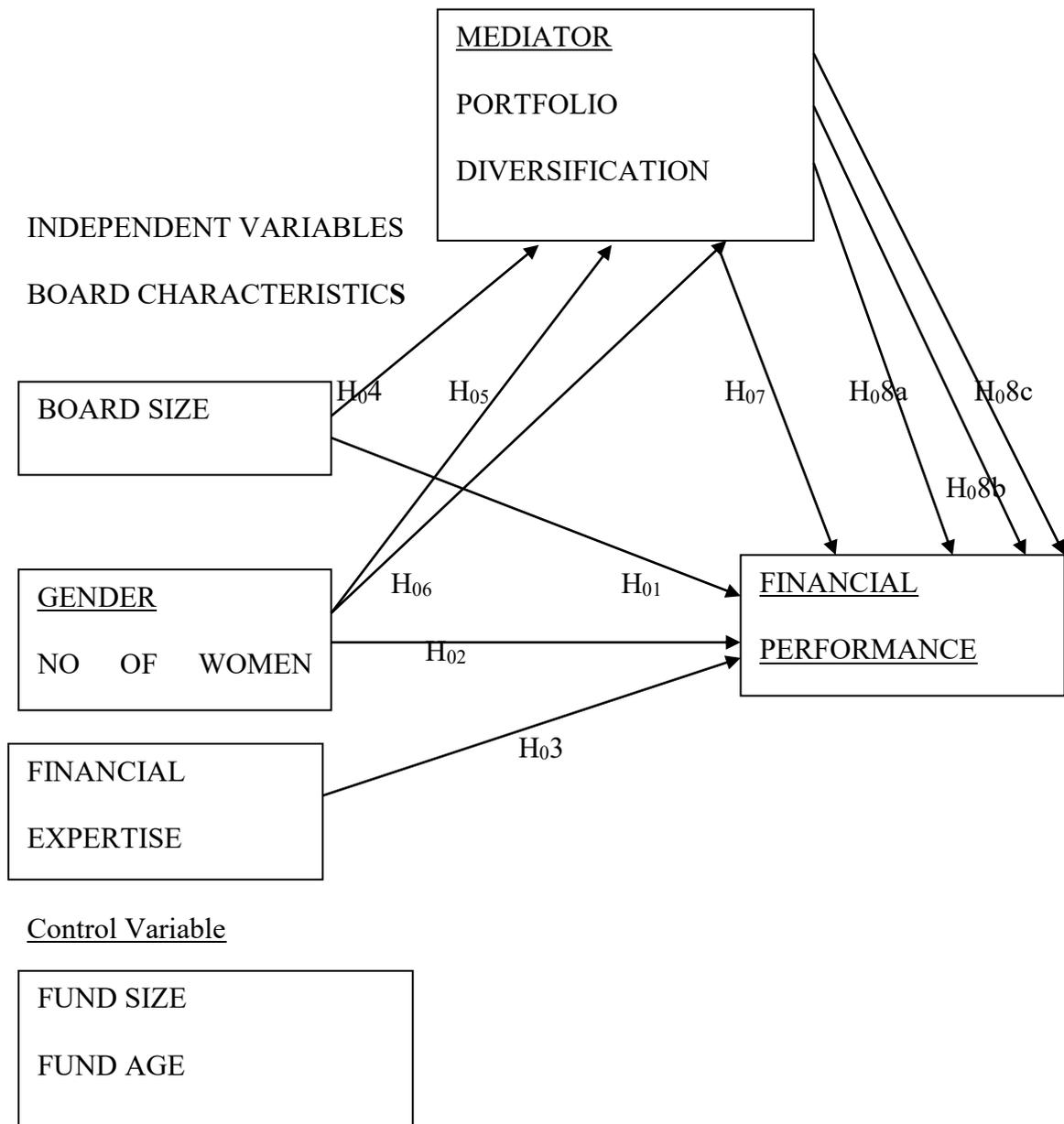
The significance of control variables on a firm's financial performance cannot be overstated. Creswell (2013) asserts that the primary purpose of control variables in quantitative analysis is to determine how the predictor variables actually affect the dependent variable. Existing studies have consistently demonstrated that a firm's size and age influence its financial performance.

Temitope et al. (2018) conducted a study in Nigeria to assess how various factors namely fund age, fund expenditure, contribution density, and idle contributions impact the financial performance of pension funds, with performance measured by Unit Price. Their study found that the age of the fund had a positive and significant effect on the financial performance of pension funds. They equated the age of a pension fund with the age of the pension administrators, suggesting that more established administrators tend to manage funds with better financial performance.

In Kenya, Mboi et al. (2018) investigated how firm characteristics (specifically age and size) moderate the relationship between a company's capital structure and its financial performance among medium and large enterprises. Their study analyzed secondary data from the audited financial statements of 60 large and 30 medium-sized companies listed on the Nairobi Securities Exchange (NSE), covering a six-year period from 2011 to 2016. They measured financial performance using Return on Equity (ROE) and Return on Assets (ROA). For their analysis, they employed both descriptive and inferential statistics. Multiple regressions was used to determine the extent of the moderating effect of enterprise characteristics on the capital structure-financial performance relationship, while Pearson correlation helped ascertain the moderating effect itself. F-statistics were used for hypothesis testing. The study found a significant positive moderating effect of enterprise characteristics on the link between capital structure and financial performance. Interestingly, they also observed that firm size and age reduced the ability of accounting measures to explain variations in ROE, but increased their ability to explain variations in ROA. Their ultimate conclusion was that changes in firm size and age were responsible for decreases in ROE and increases in ROA.

## 2.8 Conceptual framework

According to Otiso (2015), a conceptual framework is a system of variable relationships that is logically designed to present the systematic view of the research problem.



**Figure 2. 1: Conceptual framework**

Source: Researcher 2025

## CHAPTER THREE

### METHODOLOGY

#### 3.0 Introduction

This chapter provides a comprehensive discussion of the research methodology and design used in this study. It includes an exploration of the research paradigm and philosophy, the identification of the target population, data collection procedures, variable measurements, data sources, models of data analysis, and the procedures for analyzing data. Wahyuni (2012) describes research methodology as a blueprint that outlines how to conduct research within a specific paradigm, guiding researchers in selecting appropriate methods. Similarly, Saunders et al. (2009) define research methodology as the theoretical framework for understanding how research should be conducted effectively. This ensures methodological rigor and alignment with research objectives.

#### 3.1 Research Philosophy

Saunders et al. (2019) define a philosophy as a foundational set of beliefs and assumptions that steer the creation of new knowledge within a particular field. Fiona (2020) offers a similar description, characterizing a philosophy as a belief concerning the appropriate way to gather, analyze, and utilize data about a particular phenomenon.

Rehman et al. (2016) define a paradigm as a core belief system and theoretical framework. This framework encompasses assumptions about ontology (the nature of reality), epistemology (what knowledge is and how it's obtained), and methodology (the overall research approach). Burrell and Morgan (2016) and Saunders et al. (2019) further elaborate that a paradigm represents a set of basic assumptions that underpin

the frame of reference, mode of theorizing, and operational methods of a particular group. They suggest that Matrix's four paradigms symbolize distinct ways of perceiving the social and organizational world. Every researcher, at their core, holds a unique view on what constitutes truth and knowledge. This perspective forms their fundamental belief system and theoretical framework, which includes their assumptions about the nature of reality (ontology), how knowledge is acquired (epistemology), the overall research strategy (methodology), and the specific techniques used (research methods).

Richards (2003) defined ontology as the fundamental nature of our beliefs concerning reality. It is this ontological inquiry that compels a researcher to question what type of reality genuinely exists." A singular, verifiable reality and truth or socially constructed multiple realities" (Patton, 2002). Johnston (2014) clarifies that ontology delves into the fundamental nature of reality. It prompts researchers to critically examine the underlying assumptions they hold about how the world functions. Ontology is generally understood through two main aspects: objectivism, which posits that social entities exist in reality independently of social actors, and subjectivism, which maintains that social phenomena are created from the perceptions and actions of social actors (Johnston, 2014). Scotland (2012) emphasizes that researchers must clarify their stance on their perception of reality and how things truly function.

Epistemology is explained as "the branch of philosophy that studies the nature of knowledge and the process by which knowledge is acquired and validated" Gall, Gall, & Borg, (2003). Cohen, Manion, & Morrison (2007) defined epistemology as the study of knowledge itself its essence, various forms, how it is obtained, and how it is shared among people. Patton (2002) adds that it is this epistemological inquiry that

prompts researchers to consider and discuss fundamental concepts such as objectivity, subjectivity, causality, validity, and generalizability in their work.

Axiology refers to the ethics and value system, or that which we believe to be true, according to Patton (2002). Chilisa and Kawulich (2015) advocate for the use of scientific data collection methods to ensure objectivity and neutrality throughout the research process. This particular research adopted a positivism paradigm. Saunders (2012) explains that positivism is characterized by the researcher's independence from the data and the maintenance of an objective perspective. Coined by Auguste Comte, positivism embodies a rigorous empirical approach, grounding all knowledge claims directly in experience and emphasizing observable facts and the underlying causes of behaviour Bogdan & Biklen, (2003). Tuli (2010) further noted that a paradigm fundamentally shapes a researcher's perception of a phenomenon, thereby guiding the selection of appropriate research methodologies.

### **3.2 Research Design**

A research design can be understood as the overarching strategy or "master plan" that dictates how a study will be carried out. It details how all the essential parts of a research project like the participants or groups, measurements, and interventions will work together to answer the research questions. Much like an architect's blueprint, it provides a structured framework. Zickmund et al. (2013) specify that a research design includes the methods and procedures for gathering and analyzing information, covering aspects such as sampling strategies, data collection approaches, data analysis techniques, and even cost timelines. Mouton (1996) emphasizes that the purpose of a research design is to plan, structure, and execute the research in a manner that optimizes the reliability and accuracy of the findings. Similarly, Yin (2003) succinctly

describes a research design as a practical action plan that guides the journey from initial research questions to the final conclusions.

This research adopted an explanatory design. Saunders et al. (2006) explained that explanatory studies are designed to identify and clarify causal relationships between variables. Their main purpose is to investigate a problem with the goal of explaining the links and connections that exist between these variables.

### **3.3 Target Population**

According to Pedhazur et al. (2013), a population refers to the entire group being studied, as determined by the research objective. It includes individuals or study subjects who share one or more common characteristics and serve as the focus of investigation in a given survey. Both Kerlinger (2003) and Lavrakas (2008) defined a population in research. Kerlinger views it as a group of elements sharing common characteristics that are central to a study. Lavrakas, on the other hand, defines it as a distinct, finite collection of units, from which data is collected, emphasizing the need for clearly defined boundaries. For this study, the population included all 31 pension funds of public universities and 12 private universities, as listed in appendices 1 and 2. Data from these entities was analyzed for the years between 2015 and 2022. This provided a total of 208 observations over the period of eight years. This comprehensive timeframe provided sufficient data to carry out the research

#### **3.3.1 Inclusion and exclusion criteria**

For a pension fund to qualify for inclusion in the research, it had to be in operation for at least a year before the start date for the research i.e. the University pension fund must have been in existence before the year 2015. Any university pension fund established after 2014 was excluded in the research. In addition any fund that may

have declared mid-stream by the regulator to be nonoperational or insolvent or not having a board of trustees was not included for analysis.

### **3.4 Data Collection**

Secondary data was used in this investigation which was obtained from audited financial reports and other relevant supporting documents. Secondary data is essential in research because of enhancing understanding, clarifying research problems, and providing insights into possible solutions (Ghauri et al., 2020). According to Saunders et al. (2009) and Sekaran & Bougie (2016), the benefits of utilizing secondary data are substantial and include: significant time and cost savings, as the data has already been collected; a reduced need for additional resources; the availability of comparative and contextual information, which can provide broader insights; the potential for discovering unexpected insights that might not have been the original focus of the data collection; and easier access to existing information. Lancaster (2005) distinguished between primary data, which is original information collected directly for a particular research aim, and secondary data, which refers to existing information initially gathered for other purposes but can still be relevant and useful for new research questions. In this study, the researcher used panel data spanning eight years, from 2015 to 2022. Panel data involves tracking the same set of units, such as individuals, organizations, or institutions, over time to observe changes and trends (Frees, 2004). The data was sourced from end of year audited financial statements and reports presented during members annual general meetings of the pension funds and later submitted to the Retirement Benefits Authority (RBA). Key financial data collected included investment assets, net plan assets, liabilities, sponsor and member contributions, investment income, investment expenses, administrative expenses, and

returns for each asset class, along with overall fund investment returns. However, only the necessary data required for analysis was extracted from the statements.

The use of panel data enabled a comprehensive analysis of pension fund performance over multiple years, offering robust insights into the patterns of contributions, investment returns, and cost management. By leveraging existing financial reports, this approach minimized data collection challenges while ensuring that reliable and verifiable data supported the research findings.

### **3.5 Variables and measurements**

This section outlined how the study's variables were measured. Financial performance, the dependent variable, was assessed using Return on Assets (ROA). The independent variables, which describe board characteristics, included board size, the number of women on the board, and financial expertise among directors. To account for other potential influences, fund size and fund age were included as control variables. Finally, portfolio diversification served as the mediating variable (M).

#### **3.5.1 Financial Performance**

The purpose for a pension scheme is to safeguard the lives of workers after they have retired and ensure that they live a decent life after they have ceased from active life. One way of ensuring that this is fulfilled is by investing the contributions made by the members and the sponsors in profitable and high yielding investments so that they can get the highest returns. Nyangeri (2014) highlighted that an effective pension fund is characterized by its ability to maintain minimal operational costs while simultaneously achieving the highest possible returns on its investments and maximizing the benefits distributed to retirees. The OECD report of 2009 further

notes that pension funds with clearly articulated investment principles tend to perform better than those without.

The financial performance of a retirement pension fund can be assessed using various metrics, such as Sharpe Ratio, the Jensen Differential Performance Index, the Treynor measure, Return on Investment, Return on Assets, and Return on Equity. This study adopted Return on Assets (ROA) as the measure for financial performance.

Iqbal et al. (2012) state that Return on Assets (ROA) and Return on Equity (ROE) are commonly used accounting metrics to evaluate a company's performance. They further elaborate that ROA, also referred to as the efficiency ratio, specifically measures how well a firm leverages its assets to produce revenue. Several other researchers, including Ombamba & Mwengesi (2016), Kutum (2015), and Sanda et al. (2011), have similarly used ROA to measure financial performance. Bathula (2008) highlighted that ROA has a direct link to management's ability to efficiently utilize corporate assets, which ultimately belong to shareholders.

$$\text{ROA} = \frac{\text{Earnings before tax}}{\text{Total investments}}$$

### **3.5.2 Board Size**

Board Size can be regarded as the sum total of all Trustees serving on a particular Fund Board over a given time. Typically, board members are appointed for a three-year term. Therefore, any trustee who served for more than one year is considered to have participated in the fund's decision-making process, which would inherently influence the financial performance of the fund. Maere et al., (2014), Routledge & Stewart, (2016)) and Korir (2020) used the number of members in the board to determine the board size. This study adopted the same method to determine the size of

the board. The number of board members was then converted into the natural log for analysis purposes.

Board size = Total count of board members

Board Size = Natural log of the total number of board of trustee members

### **3.5.3 Gender Diversity**

Different researchers have used different methods of determining board gender diversity. For example, Marianova et al (2010), Gul, Shnidhi, & Mg (2011) and Adams & Ferreira (2009) determined board gender diversity as the ratio of females in the board to the total number of members of the board. Dezso & Ross (2012) and Campbell & Minyuez-Vera (2008) appraised board gender diversity as a dummy variable with a score of 1 in case there was at least one female in the board and 0 if there was none. This research used the method used by Marianova, Plantenya, & Remery (2010), Gul, Shnidhi, & Mg (2011), Adams & Ferreira (2009) and Oduor (2020) where board gender diversity was determined as a ratio of females in the board to the total number of members in the board. The number of trustees in each scheme was ascertained and thereafter the proportion of women was determined as a fraction of the total membership.

Proportion of females in the Board =  $\frac{\text{Number of women in the Fund Board}}{\text{Board size}}$

### **3.5.4 Financial Expertise**

Iskandar et al. (2013) defined a financial expert director as someone with a strong background in finance, evidenced by their knowledge and experience in related fields. This would typically encompass qualifications and practical understanding in fields such as accounting, financial analysis, investment management, or financial reporting. Financial expertise was determined from the biographies of the board of trustees in

the audited financial statements. The websites of the individual pension funds also complemented the financial statements. Research done by Guner et al., (2008), Iskandar et al., (2013) made a count on the number of board members with knowledge and expertise in financial related areas and this research adopted that stance taken by the two researchers.

$$\text{Financial Expertise} = \frac{\text{Number of board members with financial knowledge}}{\text{Total Number of board members}}$$

### **3.5.5 Portfolio Diversification**

Diversification, as defined by Iraya et al. (2018), is the strategy of holding a combination of assets that are not positively correlated. The aim of this approach is that if one asset performs poorly, the investor can be compensated by the strong performance of other assets within the portfolio, thereby reducing overall risk. Different measures of diversification have been used such as Standard Industry Classification (SIC) for measuring a firm's diversity (Rumelt, 1974; Palepu, 1985), Herfindahl-Hirschman index (HHI) (HHI) (Beryl, 1971) and entropy measure of diversification. This study adopted the Specialization Ratio (SR) as initially proposed by Rumelt in 1974. Iqbal et al. (2012) agree that the Specialization Ratio is one of the valid measures used to quantify diversification. Rumelt defined the Specialization Ratio (SR) as a measurement that expresses how much of a company's total annual sales come from its single largest business segment. Essentially, it's the proportion of total firm revenue attributed to its most significant business activity.

Sources According to Rumelt, firms under study were categorized as undiversified if  $SR > 0.95$ , moderately diversified if  $0.95 < SR \leq 0.7$  and highly diversified if  $SR < 0.7$ . Customizing this ratio in the study,  $SR = \text{highest Investment in the portfolio} / \text{divided by the total investments of the pension fund}$ .

$$SR = \frac{\text{Highest investment in the portfolio}}{\text{Total investments}}$$

### **3.5.6 The Mediating effect of portfolio diversification**

Mediation analysis, as described by Prado et al. (2014), examines the indirect process through which an independent variable (X) affects a dependent variable (Y) via one or more mediating variables (M). Hayes (2013) further clarifies that this analysis is crucial for establishing evidence or testing hypotheses regarding the underlying mechanisms that explain how certain effects manifest, or the conditions under which they are promoted or hindered. Ultimately, Namazi and Namazi (2016) contend that identifying mediating variables helps to illuminate the precise nature and impact of the relationship between independent and dependent variables, leading to a more accurate and practical understanding of the study's overall dynamics.

MacKinnon, Krull, and Lockwood (2000) and Little (2013) contend that a mediator reduces or filters the causal effect between the independent and dependent variable because the mediator explains part, or even all, of the relationship between X and Y, based on the premise that X causes M, and M in turn causes Y. Both Cepeda et al. (2018) and Aguinis, Edwards, and Bradley (2016) underscore that mediation focuses on identifying an intermediate variable or mechanism that serves as the conduit through which an initial variable (antecedent) influences a final outcome. In essence, they highlight that mediation helps explain how an effect is transmitted.

Namazi and Namazi (2016) highlight a core assumption in mediation analysis: that the independent variable doesn't directly affect the dependent variable. Instead, the independent variable first impacts a mediator variable, which then, in turn, influences the dependent variable. The primary goal of testing for mediation, they explain, is to

understand the underlying mechanism or pathway through which a cause ultimately leads to an outcome. Similarly, Preacher and Hayes (2008) emphasize that developing a mediation hypothesis centers on identifying the "how" or "by what means" an independent variable (X) exerts its effect on a dependent variable (Y), typically through one or more intermediary variables (mediators).

Baron and Kenny (1986) famously postulated four conditions for mediation to occur, known as the Baron and Kenny Mediation model: Condition 1 (H01): The predictor variable (X) must relate significantly with the endogenous variable (Y) in the absence of the third variable (mediator). Condition 2 (H02): The predictor variable (X) must relate significantly with the third (mediating) variable (M) in the absence of the dependent variable. Condition 3 (H03): The third (mediator) (M) must relate significantly with the dependent variable (Y) in the absence of the independent variable. Condition 4: The relationship between the independent variable (X) and the dependent variable (Y) becomes insignificant in the presence of the third (mediating) variable. A full mediation occurs if the relationship becomes insignificant, while a partial mediation occurs if it remains significant but with a material change in strength. Ultimately, mediation analysis seeks to answer questions about how an independent variable (X) affects a dependent variable (Y). The mediating variable forms the third variable to an  $X \rightarrow Y$  relation so that the causal sequence is modeled such that X causes the mediator M, and M causes Y, that is,  $X \rightarrow M \rightarrow Y$ .

Baron and Kenny (1986) popularized a classic approach to testing for mediation, which involves a systematic four-step process using multiple regression analyses. Their method requires examining the statistical significance of coefficients at each stage. Specifically, they proposed three key regression equations: Regressing the

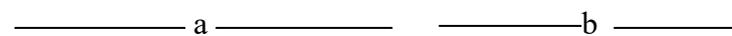
mediator (M) on the independent variable (X). This regression aims to establish whether the independent variable significantly influences the proposed mediator; to regress the dependent variable (Y) on the independent variable (X). This step determines the overall, direct impact of the independent variable on the dependent variable without considering any mediating effects;

To regress the dependent variable (Y) on both the independent variable (X) and the mediator (M): This multiple regression analysis allows researchers to simultaneously assess the individual contributions of both the independent variable and the mediator to the dependent variable.



Step 1: Conduct a regression analysis with X predicting Y to test for path C alone.

$$Y = B_0 + B_1X + e$$



Step 2: Conduct a regression analysis with X predicting M to test for path a alone

$$M = B_0 + B_1X + e$$

Step 3: Conduct a simple regression analysis with M predicting Y to test the significance of path b alone

$$Y = B_0 + B_1M + e$$

Step 4: conduct a multiple regression analysis with X and M predicting Y

$$Y = B_0 + B_1X + B_2M + e$$

Baron and Kenny's (1986) framework for mediation analysis outlines a four-step process to determine if a variable (M) explains the relationship between an independent variable (X) and a dependent variable (Y). The fourth step focuses on whether the mediator's influence (path 'b') on the dependent variable (Y) remains

significant even after accounting for the independent variable (X). If, after controlling for the mediator (M), the independent variable (X) no longer significantly predicts the dependent variable (Y), this indicates full mediation. However, if both X and M still significantly predict Y, it suggests partial mediation. To establish a mediating effect, Baron and Kenny (1986) set out three essential conditions: The independent variable (X) must have a significant effect on the dependent variable (Y) when the mediator (M) is not included in the model; The independent variable (X) must significantly influence the mediator variable (M); The mediator variable (M) must significantly affect the dependent variable (Y). Full mediation is specifically identified when, upon the inclusion of the mediator (M) in the model, the independent variable's (X) relationship with the dependent variable (Y) becomes statistically non-significant, and its regression coefficient is substantially reduced.

### **Mediating Regression Equation**

For a single mediating variable M:

$$Y = i_1 + c X + e_1, \quad \text{Equation 1}$$

$$Y = i_2 + c' X + b M + e_2, \quad \text{Equation 2}$$

$$M = i_3 + a X + e_3, \quad \text{Equation 3}$$

Where: X is the independent variable

Y is the dependent or outcome variable

$i_1$ ,  $i_2$ , and  $i_3$  are intercepts in each equation; and  $e_1$ ,  $e_2$ , and  $e_3$  are residuals

### **3.5.7 Control Variables**

Kirui (2014) explained a control variable as any factor that consistently remains unchanged throughout a study and exerts a strong influence on the observed values. It is deliberately held constant or accounted for by the researcher in order to accurately

test the specific impact of an independent variable. Essentially, a control variable is a factor that is managed or neutralized due to its potential influence on the dependent variable, even though it is not the primary focus of investigation in the research itself.

### **3.5.7.1 Fund size**

According to Henetigala, (2011), the size of a firm is represented by the total assets of the firm. It can as well be explained by the number of members that constitute a fund (Chan et al. 2004; Ahmad 2009). This study quantified fund size by utilizing the total assets of a given fund. Following the methodology employed by researchers such as Kong and Kong (2017) and Tyagi et al. (2018), fund size was specifically calculated as the logarithm of total assets. Bauer et al. (2010) highlight a significant aspect of pension funds: their considerable variations in size. These substantial differences, they argue, lead to diverse approaches in how these funds strategically invest and manage their associated risks. Complementing this, Smits (2011) conducted a study specifically to ascertain whether fund size plays a role in determining the performance of Dutch Pension funds. His findings indicated that there was no statistically significant relationship between the pension fund size and its absolute performance, its relative performance, or its funding ratios. However, he did observe a crucial positive relationship: funding ratios were significantly influenced by the actual performance of the pension fund. Similar studies in financial organizations like Niresh & Velnampy (2014), Akinyomi and Olagunju (2013) Wayongah D. (2019), show that the size of the firm is an important and primary factor in determining the profitability and the overall financial performance of a firm. Akkaya and Uzar (2011), say that large firms because of diversification face less possibility of default compared to smaller firms. Rajan & Zingales (1995) emphasize the significant role of firm size and

its impact on an enterprise's financial performance. From the perspective of trade-off theory, they propose that a larger enterprise's size should correlate positively with its leverage. This is because bigger companies typically boast more diversified portfolios and consequently face lower risk, enabling them to secure greater borrowing capacity and experience less financial distress.

Several studies have also delved into the moderating effect of firm size, including research by Wayongah and Mule (2019), Abbasi and Malik (2015), and Vithessonthi and Tongurai (2015). These studies consistently reveal that fund size exerts a notable influence on the magnitude of the performance of the variables under investigation. In this particular research, fund size was included as a control variable precisely because it has been empirically shown to impact the financial performance of firms

#### **3.5.7.2 Fund age**

According to Temitope (2018), there's a direct connection between a pension fund's financial performance and its age, which refers to how long the fund has been operational. In essence, the longer a pension fund has been in existence, the more likely its financial performance is to be influenced by that longevity. Indeed, Temitope et al. (2018) discovered that the age of the fund is a significant determinant of pension fund performance in Nigeria. Supporting this notion, Carter (1998) suggests that older firms, by virtue of their longer operating histories, provide investors with a more robust basis for accurately estimating future cash flows. In this context, pension fund age was measured as the natural logarithm of the number of years since the fund's establishment. Existing research consistently demonstrates that firm age influences the financial performance of pension funds, as evidenced by studies from Berger and Udell (1990), Loderer and Waelchli (2009), and Kutum

(2015). Given this established impact of age on a pension scheme's financial performance, it is imperative to control for this variable in research to isolate the true effects of other factors.

**Table 3. 1: Summary of Measurement of Variables**

<b>Variable</b>	<b>Description</b>	<b>Measurement</b>
ROA	Return on Assets	Net Income/Total assets
BDSIZE	Board size	Natural log of the Board size
WoSize	Number of women in the board	<u>Number of women</u> Board size
FinExp	Financial Expertise	<u>Number with Financial Knowledge</u> Board Size
FundSize	Fund size	Natural log of fund assets
FundAge	Fund Age	Natural log of the number of years since the fund was established
DivRatio	Portfolio Diversification	<u>Highest investment in the portfolio</u> Total investment of the pension fund

**Source: Researcher 2025**

### 3.6 Model Diagnostic tests

Statistical tests were carried out to test the suitability of model used for the research. There normally are requirements that need to be met to ensure that the data can easily fit in the multiple linear regression models. The tests include the unit root test and the Hausman test

#### 3.6.1 Stationarity test or the unit root test

Stationarity essentially means that a time series maintains a constant mean and constant variance over time. In simpler terms, if you shift the time series, its underlying distribution's shape doesn't change. One common reason for a time series to be non-stationary is the presence of unit roots. To properly analyze time series data,

it's crucial to first conduct a unit root test. This statistical test helps determine whether the time series is stationary or non-stationary. There are various methods for conducting unit root tests, including Phillips-Perron (PP) unit root tests, Dickey-Fuller unit root tests, Levin-Lin and Chu (LLC) test, Breitung's test, Pesaran and Shin test, and Hadri's residual-based LM test. This research specifically utilized the Im-Levin-Lin and Chu (LLC) test for unit root. The LLC test operates by testing the null hypothesis that all panels in the dataset are stationary, meaning they do not contain a unit root ( $H_0$ : panels are stationary,  $H_a$ :  $\alpha > 0$ ).

### **3.6.2 Fixed or random effect test**

The choice on whether to use a fixed effects and a random effects model was determined using the Hausman test. This test is crucial for identifying whether the explanatory variables are endogenous. Essentially, the Hausman test compares the estimated coefficients derived from a fixed effects model to those obtained from a random effects model. The study assessed the suitability of these two models at a 1% significance level. According to Moulton (1986) and Baltagi (1995), it is of utmost importance to test for random individual effects in panel data applications. Failing to account for these effects can lead to substantial bias in the estimation. The random effects model works by making a key assumption: it presumes that any unique characteristics of individuals or groups within the data are not related to the other independent variables being studied in the model.

### **3.7 Data analysis**

Data analysis involves applying logical reasoning to understand the information that has been collected (Zikmund et al., 2013). This process includes identifying consistent patterns and summarizing key findings uncovered during the investigation. For this

study, descriptive statistics such as bar graphs, pie charts, and tables will be employed to illustrate the demographic characteristics of the subjects. For example, these visuals will be used to show the proportions of men and women, as well as the educational and professional backgrounds of the trustees across the different pension schemes being studied in Kenya. Zikmund (2008) describes descriptive statistics as those which explain the characteristics of the population or a sample.

The relationships between the study's dependent variables (outcomes) and independent variables were investigated using inferential statistics. This was achieved by processing the quantitative data derived from financial statements using the SPSS statistical package. A multiple regression model was adopted to quantify the relationship between the independent and dependent variables.

The analysis proceeded in three distinct stages: Initially, the effect of the control variables on financial performance was determined. Following this, the independent variables were introduced into the regression equation to ascertain their direct impact on the financial position and finally, the moderator was introduced to assess its effect on each of the independent variables.

### **3.7.1 Model Specifications**

Multiple linear regression models were utilized to determine how the predictor variables (representing board of trustee characteristics) interact with the dependent variable (financial performance). According to Judd and Kenny (1981), testing for mediation requires estimating a series of regression models. Specifically, one should estimate the following three regression equations: First, regressing the dependent variable on the independent variable: This establishes the total effect of the independent variable on the dependent variable; secondly, regressing the mediator on

the independent variable: This shows the effect of the independent variable on the proposed mediator; thirdly, regressing the dependent variable on both the independent variable and on the mediator: This model allows for the assessment of the mediator's effect on the dependent variable while controlling for the independent variable, and simultaneously reveals any remaining direct effect of the independent variable and he fourth point mentioned, "regress the board of trustee characteristics and the mediator on the independent variable," seems to be a slight misstatement or redundancy in the context of the standard three-equation mediation test by Judd and Kenny (and later Baron and Kenny). The core of their method relies on the first three steps to establish the necessary relationships for mediation.

### 3.7.2 Board of trustee characteristics on financial performance

**Model 1:** Carry out a multiple regression to examine the effect of board of trustee characteristics on the financial performance. This tests hypothesis H<sub>01</sub>, H<sub>02</sub>, H<sub>03</sub>,

$$Y = \beta_0 + \beta_1 \text{BDSize} + \beta_2 \text{WoSize} + \beta_3 \text{FinExp} + \epsilon_i \dots \dots \dots \text{Equation 1}$$

**Model 2:** Carry out a multiple regression of board of trustee characteristics on the mediator (M) to determine their effect on the mediator. This tests hypothesis H<sub>05</sub>, H<sub>06</sub>, H<sub>07</sub>

$$\text{DivRatio} = \beta_0 + \beta_1 \text{BDSize} + \beta_2 \text{WoSize} + \beta_3 \text{FinExp} + \epsilon_i \dots \dots \dots \text{Equation 2}$$

**Model 3:** Carry out a multiple regression of the mediator (M) on the dependent variable to determine its effect on financial performance. This is to test hypothesis H<sub>09</sub>.

$$\text{ROA} = \beta_0 + \beta_5 \text{DivRatio} + \epsilon_i \dots \dots \dots \text{Equation 3}$$

**Model 4:** Mediating effect of portfolio diversification on financial performance.

This model will test whether portfolio diversification mediates the relationship between board of trustee characteristics and financial performance of universities pension funds in Kenya.

$$Y = \beta_0 + \beta_1 \text{BDSIZE} + \beta_2 \text{WoSize} + \beta_3 \text{FinExp} + \beta_5 \text{M} + \varepsilon_i \dots \dots \dots \text{Equation 4}$$

Where:

Y = Financial performance of the Pension Fund

$\beta_0, \beta_1, \beta_2, \dots, \beta_5$  are coefficient of the variables

$\varepsilon$  is the prediction error

BDSIZE – this is the size of the Board which is the total number of Board members

FinExp- is the proportion of financial experience

WoSize – proportion of women members of the board which represent Gender diversity

DivRatio –Diversification Ratio

### 3.7.3 Sobel test for significance

The Sobel test, also referred to as the delta method, is employed to assess the statistical significance of the indirect effect in a mediation model. Namazi et al. (2015) explain that the Sobel test works by comparing a statistic, which is derived from the indirect effect of mediation, against its null sampling distribution. This is achieved by estimating the standard error of the product of coefficients (AB), where A represents the path from the independent variable to the mediator, and B represents the path from the mediator to the dependent variable. This standard error is calculated as the square root of  $(B^2 * s_A^2 + A^2 * s_B^2)$ .

$$t = (\tau - \tau') / SE \text{ OR } t = (AB) / SE$$

Where SE is the pooled standard error term,  $SE = \sqrt{(A^2 \sigma^2 B + B^2 \sigma^2 A)}$ , and  $\sigma^2 B$  and  $\sigma^2 A$  are the variance of B and A respectively (Namazi et al (2015)). The t statistics is used for significance determination of the mediation effects. The t-test will be significant if the size of the mediated path is greater than the direct path.

### **3.8 Assumptions of the linear regression model**

#### **3.8.1 Normality**

According to Tharenou et al. (2007), normality refers to the idea that a continuous variable's scores are spread out in a normal, or bell-shaped, curve around their average. This means the data points are symmetrically clustered around the average, with fewer data points appearing further away from the mean. This assumption assures us that the p values of t-test are valid. It's important to note, however, that when variables deviate from a normal distribution meaning they are significantly skewed or contain substantial outliers this can indeed distort observed relationships and compromise the validity of significance tests. In this particular study, outliers were identified through careful inspection of histograms and frequency distributions. Normality in this study was checked using Shapiro – Wilk normality test. For the purpose of this test, the null hypothesis ( $H_0$ ) posits that the data adheres to a normal distribution, whereas the alternative hypothesis ( $H_1$ ) contends that the data does not follow a normal distribution. The assessment of the normality assumption was conducted by comparing the resulting p-value against a significance level of 0.05. If the calculated p-value surpassed this threshold, the null hypothesis was not rejected, thereby indicating that the data is indeed normally distributed.

### 3.8.2 Auto-correlation

This phenomenon is also known as serial correlation, and it frequently occurs in time series data. It describes a situation where the value of a dependent variable at a given time ( $t$ ) is related to its value at a previous time ( $t-1$ ). In this research, autocorrelation was tested using the Wooldridge test. This test is particularly suitable for assessing first-order autocorrelation, especially when dealing with random effects in panel data. The test statistic generated typically ranges between 0 and 4. A value of two (2) indicates the absence of autocorrelation, meaning there is no linear relationship between consecutive error terms. Conversely, a value approaching zero (0) suggests positive autocorrelation, where a positive error is likely followed by another positive error, and a negative error by another negative error. On the other hand, a value nearing four (4) points to negative autocorrelation, implying that a positive error is typically followed by a negative error, and vice-versa (Saunders et al., 2006).

### 3.8.3 Homoscedasticity

Data is Homoscedastic if the residuals are the same along the regression line i.e. the variance is the same across the independent variables. If this assumption is violated, and the variance of residuals differs across levels of the predictors, the model suffers from heteroscedasticity. There are several ways of testing homoscedasticity. These are: Breusch-Pagan / Cook-Weisberg Test; White's Test and Graphical Methods. The Breusch-Pagan test was employed to assess for Homoscedasticity. This test yields a statistic that is asymptotically distributed as a chi-square ( $\chi^2$ ) with  $k-1$  degrees of freedom, where  $k$  represents the number of regressors, excluding the constant term. If the P-value is greater than 0.05, then this indicates the presence of Homoscedasticity,

meaning that the variance of the errors is constant across all levels of the independent variables.

### **3.8.4 Multicollinearity**

Multicollinearity is a phenomenon in which independent variables have a high degree of correlation among themselves. When Multicollinearity is present, it can significantly disrupt statistical analysis, thereby limiting the validity and scope of research conclusions that can be drawn. Creswell (2017) asserts that an attempt to determine the specific degree to which independent factors explain changes in the outcome variable may lead to unexpected and unreliable results when Multicollinearity is present. When the independent factors are significantly associated with one other, a problem in prediction will arise. Multicollinearity causes increased standard errors in Beta evaluations which results in lower dependability and sometimes misleading conclusions. Diagnostic tools commonly used to detect and assess the severity of Multicollinearity include the variance inflation factor (VIF), the condition index (and related condition number), and the variance decomposition proportion (VDP). These tools help researchers identify if independent variables are too highly correlated with each other, which can compromise the reliability of regression analysis results. For this study, both the tolerance value and its inverse, the Variance Inflation Factor (VIF), were employed to test for Multicollinearity. Hair et al. (2006) suggest that a very small tolerance value (specifically 0.10 or below) or, conversely, a large VIF value (10 or above) is indicative of high collinearity among independent variables. Gujarti & Porter (2010) are even more conservative, asserting that VIF values of 10 or higher (or even over 5 in some cases) are generally considered to signify extreme Multicollinearity.

## CHAPTER FOUR

### DATA ANALYSIS, PRESENTATION AND INTERPRETATION

#### 4.0 Introduction

The results of the research findings are presented in this chapter after a comprehensive analysis has been conducted. The data collected during the study was systematically analyzed using STATA package to ensure clarity and relevance in addressing the research objectives. The results encompass both descriptive statistics, which summarize the basic features of the data, and inferential statistics, which allow for conclusions to be drawn about the universities pension funds in Kenya. Each section of this chapter provides detailed insights into key variables and their relationships, as well as interpretations of the patterns identified. The goal is to transform raw data into meaningful information that supports evidence-based conclusions and recommendations.

#### 4.1 Data characteristics

The data used was from 27 Universities Pension Funds between 2015 and 2022. There were eight private universities and nineteen public universities studied. Using the inclusion exclusion criteria, one University Pension Fund did not meet the threshold because the fund was under a corporate trustee. This left the researcher with twenty six pension funds; eighteen public and eight private giving a total of 208 observations. The data was derived from the audited annual returns to the RBA as they had been presented to the fund members during their annual general meetings. In this study, Return on Assets (ROA) served as the dependent variable. The independent variables characterizing the pension fund board were board size, the number of women on the board, and directors' financial expertise. To understand how these factors interact with

financial performance, portfolio diversification was introduced as a mediating variable. Finally, fund size and fund age were included as control variables.

#### **4.2 Descriptive statistics**

The research variables were fed into the STATA programme to determine the count, the lowest and highest for each of the variable, the mean and the standard deviation. According to Lagat (2018), the mean of a variable provides insight into the central tendency or general direction of the data. Conversely, the standard deviation offers an indication of the average spread or distance of individual observations from that mean. A low standard deviation suggests that most observations are tightly clustered around the mean, implying less variability. In contrast, a higher standard deviation signifies that observations are more dispersed or spread out from the mean, indicating greater variability in the data. The total number of observations was 208 resulting from 26 Universities in Kenya for 8 years.

The total number of observations was 208 from the 26 University pension funds in Kenya that met the inclusion/exclusion criteria. The mean board size of the Universities Pension Funds in Kenya for the years under research was 7. This mean aligned with the findings of Loh and Nguyen (2018) in their study titled "Board Diversity and Business Performance In Singapore-Listed Companies." The maximum board size was observed to be 14 trustees while the minimum was observed to be 4 trustees. The standard deviation was found to be 1 which indicated that the distribution of the values have very much deviated from the mean. Altrata Global Gender Diversity Report (2023) suggested that the board size should range between 6 and 12 members depending on the firm size.

The average number of women of the Universities pension funds in Kenya was 2 while the highest number of women is 5 and the minimum number is 1. The standard deviation is 0.823 while the coefficient of Skewness and Kurtosis was 0.472 and 3 respectively. This shows that the variables are deviated from the mean these results portray a disproportionate representation of women in the board as observed by OECD (2021) despite evidence of their impactful contributions to proper decision making. A study by Him for Her and Crunchbase (2023) emphasizes the importance of having at least three women on boards to maximize the economic and governance benefits of diversity. The study suggests that boards need at least three women to fully harness the economic benefits of diversity. Adams, R. B., & Ferreira, D. (2009) aver that having three or more women in the board will enhance board effectiveness and governance. The study findings show that averagely the universities funds have met the recommendations of Adams, R. B., & Ferreira, D. (2009) as well as Him for Her and Crunchbase (2023).

The average number of the board of trustees who have financial expertise Universities Pension Funds in Kenya is 3 trustees. The maximum is 5 while the minimum number is 1. The standard deviation in this variable was 1 while the coefficient of skewness and kurtosis was 1 and 4 respectively. These coefficients depict that the variable of financial expertise is very much dispersed from the mean. Nadège & and Carolina (2023) have recommended that a firm should have at least 2 board members with financial expertise. As shown in the table below, the mean fund age is 18.538 years with the highest age being 55 years and the lowest age being 1 year. The standard deviation is 12.074. These statistics show that the variable data was very much deviated from the data mean. The mean fund size was Ksh 24.2B. The minimum fund

size was found to be Ksh 13.9 Million while the maximum fund size was Ksh 17.4B. The standard deviation was 3.78B.

ROA (Return on Assets) measures the profitability relative to total assets. The mean ROA was 0.0880 (or 8.8%), with a standard deviation of 0.0223. The lowest value of ROA is -0.00678 while the highest value of ROA is 0.2148. These results show a significant variability in the profitability of the Universities pension funds.

The mean Diversification Ratio of the Universities pension funds in Kenya is 0.0599. The lowest and highest Diversification Ratio is -0.00678 and 0 respectively. The standard deviation was 0.0288.

**Table 4. 1: Results for Descriptive statistics**

Statistics	N	Min	Max	Mean	SD
FundAge	208	1	55	17.53846	12.07939
Fund Size	208	13.9M	17.4B	2.42B	3.78B
Board Size	208	4	14	7.485577	1.203772
Women Size	208	1	5	2.240385	0.8223355
FinExp	208	1	7	2.913462	1.134531
DivRatio	208	-0.00678	0.3216267	0.059853	0.0288133
ROA	208	-0.00678	0.2147688	0.08801	0.0223291

M = Million B = Billion FinExp = Financial Expertise, DivRatio = Diversification Ratio

Source: Research 2025

#### 4.2.1 Descriptive Statistics of Variables over the years

The table shown here under shows the descriptive statistics of the Universities Pension funds in Kenya in relation to the mean and standard deviation over the eight year period under study. The table shows the mean and the standard deviation for each year from 2015 to 2022 for the variables Fund Age, Fund Size, Board Size Women Size, Financial Expertise, Diversification Ratio and ROA

From the table, we are able to deduce that the mean Fund Age has a consistent increase from 14.04 years in 2015 to 21.04 years in 2022. This is an indication that the Universities Pension Funds are getting older over time. The standard deviation remains constant at 12.06, reflecting a stable variation in the ages of the funds. There isn't much deviation of the fund ages from the mean.

The mean Fund Size has demonstrated growth, starting at approximately 1.69 billion in 2015 and reaching about 2.85 billion in 2022. The Standard deviation ranged between 3.07B and 4.30B which shows a considerable dispersion, reflecting variations in fund sizes across institutions. Larger funds may leverage economies of scale, while smaller funds might face constraints in achieving diversified investments. These findings align with a report by OECD (2020), which highlights growth in pension assets globally and underscores the need for smaller funds to consolidate for efficiency. It is also notable that the standard deviation of Fund Size has increased over time indicating growing variability in the sizes of the funds.

Board Size (BDSIZE) remains relatively stable, showing a mean of around 8 members, the standard deviation fluctuates but stays around 1, indicating a minor variability in board sizes. This finding resonates well with the findings of Lipton and Lorsch (2018)

who recommended the importance of maintaining manageable board sizes to ensure effective decision-making. The number of women on the board remains almost constant and the increase from 2.15 in 2015 to 2.27 in 2022 is insignificant. The standard deviation decreases over the years, indicating less variability in the number of women on boards by 2022. This increase is important because it shows that the Universities Pension Funds in Kenya are tending towards the attainment of the 2/3 gender rule as enshrined in the Kenyan Constitution of 2010.

Financial expertise (FinExp) shows a slight decrease from 3.38 in 2015 to 2.77 in 2018 but generally stabilizes around 2.77 from 2018 to 2022. The standard deviation decreases over time, suggesting more uniformity in financial expertise. This uniformity in financial expertise is important because it shows that the Universities Pension Funds have experienced the role that trustees with financial knowledge play in important financial decisions. Past research has shown the importance of having directors with financial expertise in decision making process.

The mean of Diversification Ratio (DivRatio) has been unstable through the years starting at 0.0586 in 2015, decreasing to 0.0498 in 2018, and then rising to 0.0764 in 2022. The standard deviation of has been low which depicts a low variability from the mean which has a notable decrease in 2020.

The mean of ROA displays a slight upward trend, starting at 0.0810 in 2015 and reaching 0.1087 in 2022. This shows that there has been a good return on the investments made. The standard deviation shows some fluctuation but generally remains around 0.02 meaning that there has been a low variation from the mean. It also indicates a consistent variation in ROA.

In general, the Universities Pension Funds in Kenya have demonstrated growth over the years in terms of size and returns on assets. The boards of trustee characteristics have also remained relatively stable depicting stable governance within the funds. This has helped in maintaining financial performance stability. The variability in the dividend ratios and Return on assets may be as a result of continued adjustments to the changing economic environment in the country.

**Table 4. 2: Descriptive Statistics over the Years**

YEAR	FundAge	FundSize	BDSIZE	WoSize	FinExp	DivRatio	ROA
2015 M	14.03846	1.69B	7.653846	2.153846	3.384615	0.585536	.0809651
SD	12.06476	3.07B	1.056118	0.9671528	1.444352	.0596967	.0354352
2016 M	15.03846	2.15B	7.692308	2.269231	3.115385	.0591427	.0844576
SD	12.06476	3.57B	1.59422	.8744229	1.505375	.021646	.018861
2017 M	16.03846	2.27B	7.615385	2.230769	2.923077	.0557745	.0827445
SD	12.06476	3.86B	1.09825	.7646015	1.163549	.0276599	.017745
2018 M	17.03846	2.37B	7.576923	2.192308	2.769231	.0497852	.0782088
SD	12.06476	3.80B	.9868364	.5670436	.862911	.0166203	.0119697
2019 M	18.03846	2.47B	7.269231	2.269231	2.730769	.0563385	.081323
SD	12.06476	3.80B	1.150919	.7775702	.9190296	.0220897	.0133546
2020 M	19.03846	2.67B	7.192308	2.346154	2.730769	.0629007	.0946006
SD	12.06476	4.05B	1.233507	.8918434	.9190296	.0149151	.0175219
2021 M	20.03846	2.92B	7.500	2.192308	2.884615	.0599208	.0930351
SD	12.06476	4.30B	1.30384	.8952868	1.032547	.0192298	.0127131
2022 M	21.03846	2.85B	7.384615	2.269231	2.769231	.0764046	.1087477
SD	12.06476	4.02B	1.168826	.8744229	1.031802	.016968	.0255562
Total M	17.53846	2.42B	7.485577	2.240385	2.913462	.0598526	.0880103
SD	12.07939	3.78B	1.203772	.8223355	1.134531	.0288133	.0223291

M = Mean, SD = Standard Deviation B= Billion

Source: Researcher 2025

#### 4.2.2 Descriptive Statistics Sector-wise

The research desired to compare the sectorial statistics of the private universities pension funds vis-à-vis the public universities pension funds in Kenya. The statistics are as shown by table 4.3.

According to the statistics generated, the public universities exhibit a significantly larger average fund size at Ksh 3.16 billion compared to Ksh 718 million for the private universities. This vast difference likely reflects the access public funds have to broader capital markets and larger pools of resources. Public funds may also have a wider investor base due to the huge contributions. The high contributions by both the employee and the employer could also be a factor in the huge mean fund size of the public universities

A comparison of the average fund age shows that the private sector has a higher average fund age of 19.625 years compared to 14.89 years in the public sector. This finding suggests that private universities funds in Kenya have been in operation longer than the public Universities. A possible implication is that private funds have more experience, though this may also indicate a slower growth trajectory compared to newer, younger public funds.

A look into the average board size shows that public universities funds have an average board size of 8 members as compared to 7 members in the private universities pension funds. This slight difference may be attributed to the clamour for better governance structures in the public funds and public sector in Kenya. There is also the possibility of more inclusivity in order to comply with stricter regulations as stipulated in the laws.

In terms of gender diversity, Public funds have an average of 2.32 women on their boards as compared to 1.95 women in private funds.

This difference indicates a better representation of women who are in leadership positions in the public sector. It shows a move in the right direction for public

institutions move to improving gender equality and adherence to the requirements of the constitution and principles of good governance. Public sector companies may be more subject to corporate governance codes or shareholder pressure to ensure diversity in leadership.

In terms of financial expertise, both public pension funds and private pension funds exhibit an almost equal membership with 2.92 members having financial expertise on public boards of trustees and 2.89 on private boards' board of trustees. This suggests that regardless of whether public or private pension fund, each recognizes the importance of financial expertise in corporate governance.

The diversification ratio is a measure used to evaluate the benefits of diversification within a portfolio. It is calculated by comparing the risk of the overall portfolio to the weighted average risk of its individual assets. The lower the diversification ratio, the greater is the benefit of diversification. A comparison between the Diversification Ratio Private Universities Pension funds and the Public Universities Pension funds show that at an average of 5.84%, the public universities pension funds are more diversified than their Private Universities Pension Funds at 8.66%. The summary of these findings is that Public Universities Pension Funds have a better risk reduction from diversification compared to Private Universities Pension Funds Firm A, as indicated by the lower diversification ratio.

In the period under consideration, the Public Universities Pension Funds Posted an average return on assets (ROA) of 8.86% as compared to the Private Universities Pension Funds average of 8.66%. This difference is basically marginal. However, the Public Universities Pension Funds ROA is slightly higher than the Private Universities Pension Funds. While the difference is small, it suggests that public

Universities funds, despite their larger size and potentially greater complexity, are able to achieve a somewhat more effective use of their resources to produce revenue.

**Table 4. 3: Descriptive Statistics Sector-wise**

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SECTOR	FundAge	FundSize	BDSIZE	WoSize	FinExp	DivRatio	ROA
PRIVATE	19.625	0.718B	6.92188	1.95313	2.89063	0.0631	0.08657
PUBLIC	14.88889	3.16B	7.73611	2.31944	2.91667	0.05836	0.0886
Total	16.34615	2.41B	7.48558	2.20673	2.90865	0.05982	0.08798

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Source: Researcher 2025

### 4.3 Diagnostic Tests Results

#### 4.3.1 Unit Root Test

A Unit Root Test is a statistical method used to ascertain if a time series variable is non-stationary because a unit root is present. According to Gujarati (2003), a time series is deemed stationary (or immobile) if its mean and standard deviation are consistent over time. This characteristic, stationarity, means that the statistical properties of the time series, such as its mean and variance, do not change over time. Conversely, if a time series is non-stationary, statistical analysis can result in inaccurate conclusions. For this study, the Levin, Lin, and Chu (LLC) Test was employed to conduct the unit root test. The test hypothesis for the Unit Root Test is:

$H_0$ : Panels contain unit

$H_a$ : Panels are stationary

The results for Levin, Lin, and Chu (LLC) Test for Stationarity are shown in table 4.4 below. The test was done at 5% level of significance. From the table 4.4 below, the variables had the following p-values: fund size p-value = 0.0001; fund age p-value = 0.0002; board size p-value = 0.0000; women size p-value = 0.0001; financial expertise p-value = 0.0000; diversification ratio p-value = 0.00029 and ROA had a p-value = 0.0000. It can be observed that for all the p-values, the null hypothesis  $H_0$  is less than zero and therefore we rejected the null hypothesis at the 0.05 level of significance meaning that the alternative hypothesis  $H_a$  is accepted and that all panels do not have unit root and therefore stationarity holds.

**Table 4. 4: Unit Root Test Results**

<b>Variable</b>	<b>Statistic</b>	<b>P-Value</b>
FundSize	-3.8098	0.0001
Fund Age	-3.5001	0.0002
BDSIZE	-4.1952	0.0000
WoSize	-3.7382	0.0001
FinEXp	-4.7043	0.0000
DivRatio	-2.7535	0.0029
ROA	-4.0934	0.0000

Source: Researcher 2025

#### 4.3.2 Analysis of Correlation between variables

Correlation analysis is used to measure both the strength and direction of the relationship between pairs of variables. To achieve this in the study, Pearson Correlation coefficients were calculated. These coefficients specifically determine the measure of linear association existing between any two variables within the study that were measured on a continuous scale. The strength of association of relationship between boards attributes might differ among firms and industries in various circumstances. The correlation was done at 5% level of significance. The Pearson correlation coefficients can range from -1 to 1. A perfect negative linear relationship is represented by a value of -1 meaning that as one variable increases, the other decreases proportionally. A perfect positive linear relationship is represented by a value of +1 which means that where both variables increase together proportionally. A value of zero suggests that there is no linear relationship between the two variables. Values closer to -1 or 1 indicate a stronger linear relationship, while values closer to 0 indicate a weaker one. There is no universally accepted threshold as to the acceptable value of correlation but a guide as indicated is acceptable. When  $R=0$ , there is no correlation; when  $0.1 \leq |R| < 0.3$ , there is a weak correlation; when  $0.3 \leq |R| < 0.5$ , there is a moderate correlation and when  $|R| \geq 0.5$ , there is a strong correlation between the variables. This correlation matrix as indicated in the table 4.5 below shows the relationship between Return on Assets (ROA), Fund Age, Fund Size, Board Size (BDSize), Women Size (WoSize), Financial Expertise (FinExp), and Diversification Ratio (DivRatio).

The study identified that a negative relationship exists between ROA and Fund Age of -0.5161 meaning older funds tends to have lower returns on assets. This could be

explained by mature funds having more established portfolios and potentially less aggressive growth strategies, leading to lower returns and reduced profitability. A similar observation was observed by Neveu et al. (2022) who found that institutional maturity often correlates with conservative investment strategies, which may prioritize stability over high returns.

The study revealed that a positive relationship exists between ROA and Fund Size of 0.8760. This can be related to larger funds tending to perform better in terms of returns on assets. As the fund assets increase, the returns also increase and consequently this leads to an increase in ROA. This could be because larger funds may have better access to resources, better economies of scale and more diversified portfolios which may lead to higher returns. This resonates well with the findings of Choi and Luo (2021) who found that larger funds benefit from resource advantages and risk-sharing capacities, which contribute to their positive financial outcomes.

The study findings reveal a strong positive correlation between Return on Assets (ROA) and Board Size, with a Pearson correlation coefficient (R) of 0.7800. This suggests a tendency for funds with larger boards to exhibit better financial performance. This positive relationship can potentially be attributed to the benefits derived from the diverse perspectives and more robust governance structures often associated with a larger board. Such characteristics can lead to enhanced decision-making processes and more comprehensive strategic oversight, ultimately contributing to improved financial outcomes for the funds. Kwan and Lau (2020) emphasize that board diversity and size significantly impact organizational performance through improved strategic initiatives and governance practices.

The study shows a positive correlation between ROA and Women Size of 0.4121 suggesting that funds with more women on the board or leadership tend to perform slightly better. This may indicate that gender diversity has a positive, impact on the pension funds financial performance. The findings imply that the inclusion of women in the board can lead to an improved financial performance of pension funds. Past research has indicated that inclusion of women in management can lead to better decisions thus improving on performance. Bhatia et al. (2021), which demonstrate that gender diversity enhances board discussions and decision-making quality, positively influencing financial performance.

There is a positive correlation between ROA and Financial Expertise = 0.4942. This suggests that funds with a higher degree of financial expertise among leadership experience better performance. This finding resonates with studies by Ahmed et al. (2023), which highlight that financial acumen within governance teams leads to improved strategic investment decisions.

There is a negative correlation between ROA and Diversification Ratio of -0.4181 suggesting that more diversified funds tend to have lower returns on assets. While diversification usually reduces risk, it may also dilute returns if the diversified investments do not perform as well as a more focused strategy. Even though diversification reduces risk, it prevents the funds from investing in fewer portfolios with higher returns. A Previous study, by Perez and Wang (2020) similarly suggest that over-diversification may hinder aggressive growth opportunities thus leading to lower returns.

The study reports that a negative relationship exists between Fund Age and Fund Size of  $R = -0.6892$  which suggests that newer funds tend to grow faster potentially

because they adopt innovative strategies and aggressive growth models. (Zhang et al., 2021) found that in line with the life-cycle theory of organizations younger entities often prioritize expansion which will lead to larger entities.

Study findings show a weak negative correlation between Fund Age and Board Size of  $R=-0.3662$ ) giving the impression that older funds tend to have slightly smaller boards. This trend could be due to organizational consolidation or changes in governance structures over time as funds mature. Such reductions might be an outcome of efficiency-driven reforms that aim to streamline decision-making processes. Recent studies, Lopez and Martinez (2022) in their study highlighted that older organizations often restructure their governance frameworks to align with changing operational needs, which may include downsizing board sizes for cost efficiency or regulatory compliance.

There is a negative correlation between Age of the Fund and the proportion of women in leadership of  $-0.2314$ ) which indicates that older funds tend to have fewer women in their workforce or leadership roles. This pattern might reflect historical hiring practices and governance structures that favoured less diversity. However, more recent shifts toward inclusivity suggest that younger funds are more likely to prioritize gender diversity. Research by Khan and Alavi (2021) shows that organizations established in the last two decades are more likely to implement gender-diversity policies, potentially explaining this generational disparity.

There is a negative correlation between Fund Age and Financial Expertise of  $R=-0.3025$  suggests that older funds may have less financial expertise among their leadership. This could stem from entrenched traditional practices, political patronage, or cronyism, which may hinder the inclusion of modern financial expertise in

decision-making. Studies by Ong and Tan (2023) emphasize that younger organizations, being more dynamic, often seek professionals with contemporary financial skills, while older entities may rely on legacy frameworks and networks.

The correlation between Fund Age and Diversification Ratio is almost negligible ( $R=0.0737$ ), indicating that the age of a fund does not significantly influence its diversification strategy. This finding aligns with observations by Taylor et al. (2020), who noted that diversification levels are typically driven by strategic goals and market conditions rather than the organization's age.

There is a positive correlation between Fund Size and Board Size of  $R=0.7889$  suggesting that larger funds tend to have larger boards. This is likely due to the increased complexity and operational scale of larger funds, necessitating broader governance structures to manage diverse portfolios. Ahmed et al. (2021) found that larger boards often bring greater oversight and expertise, enabling funds to address the challenges of large-scale operations effectively.

The results reveal a positive correlation of 0.3640 between Fund Size and the proportion of women in the board of trustees. This suggests that larger funds tend to have slightly more women on their boards. This could reflect an increased emphasis on diversity in more prominent organizations, as noted by Lee and Kaur (2021) who observed that larger organizations are often at the forefront of implementing diversity initiatives due to greater public scrutiny.

The positive correlation between Fund Size and Financial Expertise  $R = 0.4420$  which suggests that larger funds often engage professionals with financial expertise. This trend is likely due to the complexity and scale of larger funds, which demand

advanced skill sets. This is confirmed by a recent study by Kim and Park (2023) which affirms the critical role of financial expertise in managing large, complex portfolios effectively.

The study revealed a negative correlation between Fund Size and Diversification Ratio of  $R=-0.5079$ ) which indicates that larger funds are less diversified. This could result from a strategic focus on core investments or high-return asset classes rather than extensive diversification. A study by Kwon and Park (2022) highlighted that larger funds often concentrate on specialized strategies to leverage their scale for competitive advantages, which can lead to lower diversification.

There is a positive correlation  $r=0.4412$  between Board Size and Women Representation, implying that larger boards tend to include more women. This trend aligns with diversity-promoting practices, as highlighted by studies such as Ali et al. (2022), which report a link between board size and inclusion efforts.

The research findings show a positive correlation  $R = 0.3370$  between Board Size and Financial Expertise which suggests that larger boards may include more financial experts, though the relationship is not particularly strong. This could reflect a preference for incorporating diverse skills as board size increases. Wang et al. (2023) found that boards with a larger number of members often seek to enhance their collective expertise through targeted appointments.

There is a negative correlation between Board Size and Diversification Ratio  $R = -0.5546$ ) which may be interpreted that larger boards are associated with less diversification. This may reflect a preference for more focused investment strategies that align with concentrated decision-making processes. According to Silva and Costa

(2022), larger boards often implement strategic centralization to maximize returns, which can reduce diversification levels.

A positive correlation  $R = 0.2839$ ) between the proportion of women in the board and Financial Expertise which may be interpreted to mean that funds with more women on their boards also tend to have slightly higher levels of financial expertise. This finding supports research by Bhatia et al. (2021), who noted that diverse boards often recruit members with complementary expertise to enhance decision-making.

There is a negative correlation  $R = -0.2824$  between the proportion of women in the board and Diversification Ratio which indicates that funds with more women in leadership may be slightly less diversified. This could be due to strategic preferences or organizational dynamics. However, the relationship is weak and warrants further exploration.

The research findings show a negative correlation of  $R = 0.2321$ ) between Financial Expertise and Diversification Ratio which suggests that funds with more financial expertise are slightly less diversified. This might be because financial experts often prioritize high-return, specialized investments over broad diversification. This observation aligns with findings by Perez et al. (2023), who argue that expertise-driven strategies often emphasize focused investment approaches.

**Table 4. 5: Correlation Analysis Results**

	ROA	FundSize	FundAge	BDSIZE	WoSize	FinExp	DivRatio
ROA	1.0000						
FundSize	0.8760*	1.0000					
	0.0000						
FundAge	-0.5161*	-0.6892*	1.0000				
	0.0000	0.0000					
BDSIZE	0.7800*	0.7889*	-0.3662*	1.0000			
	0.0000	0.0000	0.0000				
WoSize	0.4121*	0.3640*	-0.2314*	0.4412*	1.0000		
	0.0000	0.0000	0.0008	0.0000			
FinExp	0.4837*	0.4302*	-0.3096*	0.3167*	0.2930*	1.0000	
	0.0000	0.0000	0.0000	0.0000	0.0000		
DivRatio	-0.3869*	-0.4849*	0.0771	-0.5261*	-0.2661*	-0.2260*	1.0000
	0.0000	0.0000	0.2680	0.0000	0.0001	0.0010	

\* Sig = significant at 0.05

FundSize = Fund size, FundAge = Fund age, BDSIZE = Board size, WoSize = Women size, FinExp = Financial expertise, DivRatio = Diversification ratio

**Source: Researcher 2025**

#### 4.4 Normality test

Normality assumption assumes that the data being used for analysis is normally distributed about the mean. This study used Shapiro-Wilk test for normality. This test is normally appropriate when the sample or data set is not large i.e.  $n < 2000$ . The Null hypothesis was that the data was from a normally distributed population. The Shapiro-Wilk test results in the table 4.5 below show that the p-values for the variables as: ROA = 0.31898; Fund Size = 0.44654; Fund Age = 0.72371; Board Size = 0.37724; Women Size = 0.18109; Financial expertise = 0.64922 and Diversification ratio = 0.55061. The p-value for all the variables was more than 0.05 and therefore we conclude that the data is normally distributed. The p values range between  $p = 0.18109$  and  $p = 0.72371$ . The fact that the p-values are more than 0.05 we therefore fail to reject the Null hypothesis.

The null hypothesis was:

H<sub>0</sub>: The data follows a normal distribution

H<sub>a</sub>: The data does not follow a normal distribution

**Table 4. 6: Normality Test Results**

<b>Variable</b>	<b>Obs</b>	<b>W</b>	<b>V</b>	<b>z</b>	<b>Prob&gt;z</b>
ROA	208	0.99206	1.226	0.471	0.31898
Fund Size	208	0.99313	1.060	0.134	0.44654
Fund Age	208	0.99499	0.773	-0.594	0.72371
Board Size	208	0.99258	1.145	0.313	0.37724
Women Size	208	0.99038	1.485	0.911	0.18109
FinExpt	208	0.99451	0.847	-0.383	0.64922
DivRatio	208	0.99387	0.946	-0.127	0.55061

*FinExpt = Financial expertise, DivRatio = Diversification Ratio*

**Source: researcher 2025**

#### **4.5 Multicollinearity Test**

To specifically assess the degree of correlation among the independent variables in this research, the Variance Inflation Factor (VIF) was utilized. A high degree of correlation among independent variables can significantly disrupt statistical analysis, thereby restricting the validity and scope of the research conclusions that can be drawn. To ascertain the presence of such high correlation among one or more independent variables in this study, a Multicollinearity test was conducted, the results of which are presented in the table below.

To specifically assess the degree of correlation among the independent variables in this research, the Variance Inflation Factor (VIF) was adopted. The VIF metric

quantifies the degree to which the variance of a regression coefficient is inflated as a result of linear dependence (or correlation) with other predictor variables in the model. Consequently, elevated VIF values serve as an indicator of Multicollinearity, a condition that can undermine the reliability of the calculated regression coefficients by artificially increasing their variances. According to the guidelines established by Hair et al. (2006), Gujarati and Porter (2021), and Newbert (2008), a VIF value of 10 or more is considered indicative of problematic Multicollinearity that could distort the results and affect the study's validity. The VIF results for this study, presented in Table 4.7, ranged between 1.28 and 6.32, with an overall mean of 2.79. These results indicate that none of the independent variables exceeded the critical threshold of 10, suggesting an absence of significant Multicollinearity issues. The specific VIF values and their corresponding tolerance levels ( $1/\text{VIF}$ ) were as follows: Fund Size: VIF = 6.32; Tolerance = 0.158; Fund Age: VIF = 2.67, Tolerance = 0.375; Board Size: VIF = 3.48, Tolerance = 0.288; Women Size: VIF = 1.30, Tolerance = 0.772; Financial Expertise: VIF = 1.28, Tolerance = 0.783 and Diversification Ratio: VIF = 1.72; Tolerance = 0.581. The tolerance values of the independent variables, ranging from 0.158 to 0.783, were well above the commonly used threshold of 0.1, further confirming the absence of Multicollinearity. These findings ensure that the predictive relationships between the independent variables and the dependent variable are reliable and not unduly influenced by inter-correlations among the predictors. Such results are consistent with prior research, which underscores the importance of ensuring low Multicollinearity to maintain the interpretability and stability of regression models (Hair et al., 2006).

**Table 4. 7: Multi-collinearity Test Results**

<b>Variable</b>	<b>VIF</b>	<b>1/VIF</b>
Fund Size	6.32	0.158146
Fund Age	2.67	0.374998
Board Size	3.48	0.287596
Women Size	1.30	0.772029
Financial Expertise	1.28	0.783374
Diversification Ratio	1.72	0.580714
Mean VIF	2.79	

**Source: Researcher 2025**

#### **4.6 Homoscedasticity assumption**

Homoscedasticity is an assumption in regression analysis stating that the variance of the residuals (or error terms) within a model remains constant across all levels of the independent variables. Should this assumption be violated, meaning the variance of the residuals changes across different levels of the predictors, the model is then said to suffer from heteroscedasticity. To assess for homoscedasticity in this study, the Breusch-Pagan / Cook-Weisberg test was utilized. This is a popular test for detecting heteroscedasticity. It tests whether the residual variance is dependent on the values of the independent variables. The null hypothesis for this test (referring to the Breusch-Pagan / Cook-Weisberg test for homoscedasticity) is that the variance of the residuals is constant, which means the assumption of homoscedasticity holds true. A low p-value typically less than 0.05 indicates heteroscedasticity, meaning the assumption of homoscedasticity is violated. The results from the table indicate that the p-value is 0.3991, which is higher than the conventional significance level of 0.05. Based on

this, we fail to reject the null hypothesis. Therefore, we conclude that there is homoscedasticity in the model, meaning the variance of the residuals is constant.

**Table 4. 8: Breusch-Pagan / Cook-Weisberg test for Homoscedasticity**

Ho: Constant variance	
Variables: fitted values of ROA	
chi2 (1)	= 0.71
Prob > chi2	= 0.3991

**Source: Researcher 2025**

#### 4.7 Autocorrelation Test

Autocorrelation refers to a key assumption in regression analysis: that the error terms (or residuals) are independent, meaning they are not correlated with each other. There are several methods recommended for testing for autocorrelation in panel data. Among them is Wooldridge test, Breusch-Godfrey LM Test, Baltagi-Wu Locally Best Invariant (LBI) Test, Manual Approach Using Residuals etc. This study adopted the Wooldridge test for auto-correlation. The Wooldridge test for autocorrelation in panel data assesses whether the residuals in a panel regression model exhibit first-order serial correlation. The null hypothesis ( $H_0$ ) for this test posits the absence of first-order autocorrelation. Specifically,  $H_0$  states: "no first-order autocorrelation." In this particular case, the test produced an F-statistic of 0.374, with degrees of freedom of 1 for the numerator and 7 for the denominator, yielding a p-value of 0.5602. Given that the p-value is greater than the standard significance threshold of 0.05 ( $p=0.5602$ ), we therefore fail to reject the null hypothesis. This indicates no significant evidence of autocorrelation in the residuals. The lack of autocorrelation is crucial, as it ensures the

validity of regression estimates and avoids biases in standard errors and test statistics. Wooldridge (2002) emphasized that such tests are integral to diagnosing model adequacy in panel data studies. Therefore, the absence of autocorrelation suggests that the model assumptions regarding residual independence across time are satisfied, supporting the robustness of the findings.

**Table 4.9: Auto-correlation Test Results**

F-Statistic	0.374
P-value	0.6502
Degrees of freedom	(1, 7)

**Source: Researcher 2025**

#### **4.8 Random and Fixed Effects**

The study sought to establish whether to use random effects or fixed effects when conducting the regression analysis. According to Baltagi (1995), random and fixed effects models can produce different estimation results, particularly when the time period is short and the sample size is large. To decide which of these two models was more appropriate for the analysis, a regression was initially performed using both the fixed effects and random effects models. Following these initial regressions, Hausman's test was then applied to formally determine the more suitable model.

##### **4.8.1 Random Effects**

According to Moulton (1986) and Baltagi (1995), when working with panel data, it is critically important to test for random individual effects. Neglecting to account for these effects can result in substantial bias in the estimation of coefficients. The random effects model assumes that the individual or group-specific effects are

uncorrelated with the other independent variables included in the analysis. The random effects table as shown in Table: shows that the overall effect of BDDSize, WoSize, FinExp, DivRatio FundSize and Fund Age explain up to 78.87% of the variation in ROA can be explained by the model. Fund age has a positive coefficient of ( $\beta=0.0052135$ . this means that each additional year in Fund Age increases ROA by 0.0052, with a strong statistical significance. FundSize has ( $\beta =115.04$ ,  $p = 0.000$ . FundSize has a positive and highly significant impact on ROA. A unit increase in FundSize is associated with a 115.04 increase in ROA. BDDSize has a coefficient of  $\beta =0.0193$ ,  $p = 0.00$  which is statistically significant. This means that Board size is positively associated with ROA and for each additional board member increasing ROA by 0.0193. WoSize has a coefficient of  $\beta = 0.0007$ ,  $p = 0.024$ : The analysis indicates that the proportion of women on the board (WoSize) has a small but statistically significant positive impact on Return on Assets (ROA). This suggests that even a slight increase in the number of women on the board is associated with a marginal improvement in ROA. FinExp has a positive and significant coefficient of  $\beta = 0.0978$ ,  $p = 0.005$ . This means that financial expertise is positively associated with ROA. A one-unit increase in FinExp increases ROA by 0.0978. DivRatio has a positive and significant coefficient of  $\beta = 0.0355$ ,  $p = 0.035$ . This means that for a unit increase in DivRatio, there is an increase in ROA by 0.0355.

**Table 4. 10: Random effects**

Random-effects GLS regression		Number of obs = 208				
Group variable: YEAR		Number of groups = 8				
R-sq: within = 0.7724		Obs per group: min = 26				
Between = 0.9538		avg = 26.0				
Overall = 0.7887		max = 26				
Wald chi2 (6) = 750.15		Prob > chi2 = 0.0000				
corr(u_i, X) = 0 (assumed)						
ROA	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
FundAge	0.0052135	0.0005837	8.93	0.000	.0040696	.0063575
FundSize	115.038	10.92978	10.53	0.000	93.61598	136.4599
BDSIZE	0.019259	0.0071527	2.69	0.007	0.00524	.033278
WoSize	0.0006662	0.0002962	2.25	0.024	0.0000857	.0012467
FinExp	0.0977666	0.0352076	2.78	0.005	0.0287609	.1667723
DivRatio	0.0355395	0.016886	2.10	0.035	0.0024436	.0686354
_cons	0.8376802	0.0123636	67.75	0.000	0.8134479	.8619125
sigma_u		0				
sigma_e		0.0559378				
Rho		0 (fraction of variance due to u_i)				

**Source: Researcher 2025**

#### 4.8.2 Fixed effects

Baltagi (1995) posited that the fixed effects model assumes that any unobserved or omitted factors within the model can have an arbitrary correlation with the independent variables that are part of the analysis. He further explains that the fixed effects approach is particularly useful for exploring the relationship between predictor variables and outcome variables within a specific entity, such as a country, an individual person, or a company. This is because, as Baltagi highlights, each entity possesses its own unique, individual characteristics that may or may not influence the predictor variables being studied. The fixed effects table as shown in table below shows that the overall coefficient of Board Size, Women Size, Financial Expertise,

Diversification Ratio Fund Size and Fund Age is 0.7871. This means that up to 78.71% of the variation in ROA can be explained by the model.

Fund age has a positive coefficient of ( $\beta=0.0043896$ ). This means that each additional year in Fund Age increases ROA by 0.0043896, with a strong statistical significance. FundSize has ( $\beta = 99.27798$ ,  $p = 0.000$ ). FundSize has a positive and highly significant impact on ROA. A unit increase in FundSize is associated with a 99.27798 increase in ROA. Board Size has a coefficient of  $\beta = 0.0220358$ ,  $p = 0.002$  which is statistically significant. This means that Board size is positively associated with ROA and for each additional board member increasing ROA by 0.0220358. Women Size has a coefficient of  $\beta = 0.0006557$ ,  $p = 0.024$ : The proportion of women on the board (WoSize) has a positive and statistically significant impact on ROA. An increase in the number of women in the board increases ROA dismally by 0.0006557. Financial Expertise has a positive and significant coefficient of  $\beta = 0.0942072$ ,  $p = 0.007$ . This means that financial expertise is positively associated with ROA. A one-unit increase in Financial Expertise increases ROA by 0.0942072. Diversification Ratio has a positive and significant coefficient of  $\beta = 0.0281099$ ,  $p = 0.091$ . This means that for a unit increase in DivRatio, there is an increase in ROA by 0.0281099.

**Table 4. 11: Fixed effect Results**

Fixed-effects (within) regression		Number of obs	=	208		
Group variable: YEAR		Number of groups	=	8		
R-sq: within = 0.7740		Obs per group: min	=	26		
Between = 0.9454		avg	=	26.0		
Overall = 0.7871		max	=	26		
F(6,194) = 110.76						
corr(u <sub>i</sub> , Xb) = 0.2470		Prob > F	=	0.0000		

ROA	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]
FundAge	0.0043896	.0005961	7.36	0.000	.0032139 .0055653
FundSize	99.27798	11.31571	8.77	0.000	76.96038 121.5956
BDSIZE	0.0220358	0.0070757	3.11	0.002	.0080806 .035991
WoSize	0.0006557	0.0002877	2.28	0.024	.0000883 .0012232
FinExp	0.0942072	.0342485	2.75	0.007	.0266601 .1617544
DivRatio	0.0281099	.0165491	1.70	0.091	-.0045293 .0607492
_cons	0.8533593	.0124919	68.31	0.000	.828722 .8779967

sigma_u	.0205208
sigma_e	.0559378
Rho	.11861599 (fraction of variance due to u <sub>i</sub> )
F test that all u <sub>i</sub> =0:	F(7, 194) = 3.05 Prob > F = 0.0046

**Source: Researcher 2025**

#### 4.8.3 The Hausman test

This refers to a statistical test, formulated by Jerry Hausman in 1978, which is conducted to decide whether an econometric model should be estimated using fixed effects (FE) or random effects (RE). The Hausman test compares two different estimates of the model parameters under the assumption of the data generating process.

The Hausman test statistic follows a chi-square ( $\chi^2$ ) distribution. This allows researchers to evaluate the null hypothesis ( $H_0$ ), which states that the difference in coefficients between the FE and RE models is not statistically significant. If this null

hypothesis holds true, it implies that the random effects model estimates are consistent and can be used without concerns of bias.

The alternative hypothesis ( $H_a$ ) states that the fixed effects model is more appropriate. This is indicated when there are significant differences between the estimates from the two models, suggesting that the regressors are correlated with the individual effects, leading to omitted variable bias in the random effects model. In such cases, the fixed effects model is preferred as it addresses this bias by accounting for all time-invariant differences between the entities being studied.

To make this determination in the current study, two separate regressions were initially performed: one using the fixed effects model and the other using the random effects model. Subsequently, the Hausman test was conducted.

In the Hausman test, the null hypothesis ( $H_0$ ) states that the random effects (RE) model is appropriate, implying that the differences in coefficients between the FE and RE models are not systematic. The alternative hypothesis ( $H_a$ ) states that the fixed effects model is more appropriate because there are significant differences between the estimates, indicating that the regressors are correlated with the individual effects and thus the differences in coefficients are systematic.

These hypotheses were tested at a 0.05 significance level. Typically, rejecting the null hypothesis (i.e., a p-value  $< 0.05$ ) would suggest that the fixed effects model is more appropriate. In this specific case, the test statistic was  $\chi^2 = 5.73$  and the associated p-value was 0.4543. Since this p-value of 0.4543 is greater than the conventional significance level of 0.05, we fail to reject the null hypothesis. Consequently, based

on the Hausman test results as tabulated, the random effects model was deemed appropriate and used in conducting the regression analysis.

**Table 4. 12: Hausman test**

(b)	---- Coefficients ----			sqrt(diag(V_b-V_B))
	(B)	(b-B)		
fe	re	Difference	S.E.	
Fund Age	0.0346221	0.036896	-0.0022739	.0017955
Fund Size	5.538002	5.798258	-0.2602563	.1429876
BDSIZE	0.1378197	0.1335869	0.0042328	.0075333
WoSize	0.0114916	0.0109086	0.000583	.0006119
FinExp	0.1110838	0.1136003	-0.0025165	0.0025788
DivRatio	0.160844	0.1634428	-0.0025988	0.0056803

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2 (6) = (b-B)'[(V\_b-V\_B)^(-1)](b-B) = 5.73

Prob>chi2 = 0.4543

**Source: Researcher 2025**

#### 4.9 The Regression Analysis Results

Regression analysis is a statistical technique employed to examine the relationship between two or more variables. It enables the prediction or explanation of one variable based on the others. As Jackson (2012) explains, it's a collection of statistical techniques for estimating relationships between independent and dependent variables. Ahmed (2015) suggests that it's perhaps the most widely used technique for drawing inferences from experimental data. Furthermore, Gujarati (2013) notes that regression analysis evaluates the strength of these relationships and can even be utilized for

modelling future connections between variables. The study's goal was to ascertain whether portfolio diversification mediates the relationship between board of trustee characteristics and financial performance of Universities Pension Funds in Kenya. To achieve this objective, regression several regression models were fitted and the results analysed

#### **4.9.1 Regression Results for Control Variables on Financial Performance**

A control variable is any factor that remains unchanged throughout a study and significantly influences the values being measured. It is held constant to isolate and test the specific impact of an independent variable. Essentially, it's a variable managed due to its potential influence on the dependent variable, even though it's not the primary focus of the research (Kirui, 2014).

In this study, the first model was fitted to determine the effect of the control variables on the dependent variables, specifically Fund Age and Fund Size against Financial Performance (ROA). The results from Table 4.7.1 lead to the following conclusions:

**Model Significance and Explanatory Power:** The F-statistic of Wald  $\chi^2 = 539.91$  with a p-value of 0.0010 indicates that the model is highly statistically significant, suggesting that the control variables collectively have a significant impact on ROA. Furthermore, an R-squared value of 0.6773 signifies that the model explains approximately 67.73% of the variation in ROA. This high R-squared value suggests a good fit of the model to the data, indicating that Fund Age and Fund Size account for a substantial portion of the changes observed in financial performance.

**Impact of Control Variables on ROA:** Both Fund Age and Fund Size were found to be statistically significant at the 5% level, as their p-values are less than 0.05. Fund Age

has a coefficient of -0.0403446. This means that for every one-unit increase in Fund Age, ROA is expected to decrease by approximately 0.0403446 units, assuming Fund Size remains constant. At a 95% confidence level, we are confident that the true effect of Fund Age on ROA lies between -0.0638525 and -0.0168367. Fund Size has a coefficient of 0.6635663. This indicates that for each one-unit increase in Fund Size, ROA is expected to increase by approximately 0.6635663 units, holding Fund Age constant. With 95% confidence, we can say that the true effect of Fund Size on ROA lies between 0.6001508 and 0.7269819.

**Table 4. 13: Regression of Control Variables on Financial Performance**

Random-effects GLS regression		Number of obs = 208				
Group variable: YEAR		Number of groups = 8				
R-sq: within = 0.6773		Obs per group: min = 26				
Between = 0.9847		avg = 26.0				
Overall = 0.7248		max = 26				
Wald chi2 (2) = 539.91						
corr(u_i, X) = 0 (assumed)		Prob > chi2 = 0.0000				
ROA	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
FundAge	-.0403446	.011994	-3.36	0.001	-.0638525	-.0168367
FundSize	.6635663	.0323555	20.51	0.000	.6001508	.7269819
_cons	2.906518	.0895567	32.45	0.000	2.73099	3.082046

**Source: Researcher 2025**

#### 4.9.2 Regression Results for Control Variables on Diversification Ratio

When the control variables are regressed against the Diversification ratio, the results show the Wald chi2 (2) = 99.86 and  $p < 0.000$  implying that fund age and fund size have a statistically significant relationship with diversification ratio. The model as a whole is statistically significant at the 1% level, indicating that the control variables,

Fund Age and Fund Size, jointly have a significant effect on Diversification Ratio. The within R<sup>2</sup> of 0.3143 indicates that 31.43% of the variability in the dependent variable (Diversification Ratio) is explained by the independent variables within each group. Between R-squared values of 0.7239 explains the fact that 72.39% of the variation between different groups is explained by the control variables. The Overall R-squared of 0.3276 explains the fact that 32.76% of the total variation in the dependent variable (Diversification Ratio) is explained by the model. Fund Age has a coefficient of -0.078383, a Standard Error of 0.0248522, z-value: -3.15 with a p-value of 0.002 suggesting that fund age is statistically significant because the p-value is less than the 5% threshold. The regression also suggests that the 95% Confidence Interval for fund age lies between -0.1270924 and -0.0296735. It can be concluded that fund age has a statistically significant but negative effect on Diversification Ratio. A one unit increase in Fund age is associated with a decrease in Diversification Ratio of 0.078383 units assuming all other factors are held constant. The conclusion is that Fund Age has a statistically significant but negative effect on diversification ratio.

FundSize has a coefficient of 0.6373008, a Standard Error of 0.0670421, z-value of 9.51 with a p-value of 0.000 suggesting that fund size is statistically significant because the p-value is less than the 5% threshold. The regression also suggests that the 95% Confidence Interval for fund size lies between 0.5059007 0.7687009. It can be concluded that fund size has a statistically significant positive effect on DivRatio. One unit increase in Fund size is associated with an increase in Diversification Ratio of 0.6373008 units assuming all other factors are held constant. The conclusion is that Fund Size has a statistically significant but negative effect on diversification ratio.

**Table 4.14: Regression of Control Variables on Portfolio Diversification (DivRatio)**

Random-effects GLS regression		Number of obs = 208	
Group variable: YEAR		Number of groups = 8	
R-sq: within = 0.3143		Obs per group: min = 26	
Between = 0.7239		avg = 26.0	
Overall = 0.3276		max = 26	
Wald chi2 (2) = 99.86		Prob > chi2 = 0.0000	
corr(u_i, X) = 0 (assumed)			

DivRatio	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]
FundAge	-.078383	0.0248522	-3.15	0.002	-.1270924 - .0296735
FundSize	.6373008	0.0670421	9.51	0.000	.5059007 .7687009
_cons	1.644488	.1855658	8.86	0.000	1.280786 2.008191

**Source: researcher 2025**

#### 4.9.3 Regression Results for Portfolio Diversification (Mediator) on ROA

A regression analysis was conducted to examine the impact of Diversification Ratio (DivRatio) on Return on Assets (ROA). The overall R-squared value of 0.1451 indicates that approximately 14.51% of the total variation in ROA is explained by DivRatio while the within and between R-squared values are 0.1234 and 0.6703 respectively. The Wald chi-squared test statistic of 31.58 with a p-value of 0.0000, confirms that the model is statistically significant, indicating a meaningful relationship between the independent variable (DivRatio) and dependent variable (ROA). The coefficient for DivRatio is 0.2654451, with a standard error of 0.0472341. This positive relationship is significant and has a p-value = 0.000 suggesting that a one-unit increase in DivRatio is associated with an increase of 0.2654451 units in ROA, holding other factors constant. The 95% confidence interval for this coefficient ranges from 0.1728681 and 0.3580222 reinforcing the robustness of the positive effect. The constant term, 1.101233, is also significant (p-value =

0.000), representing the expected value of ROA when DivRatio is zero. The variance components reveal that 4.82% of the variation in ROA is due to differences between groups, as indicated by a rho value of .04874411, while the remaining variation is within groups. This suggests that the majority of the variability in ROA is attributed to within-group differences rather than between-group effects. Overall, the results highlight a significant and negative impact of DivRatio on ROA with most variation explained at the individual observation level.

**Table 4. 15: Regression of DivRatio on ROA**

Random-effects GLS regression		Number of obs = 208			
Group variable: YEAR		Number of groups = 8			
R-sq: within = 0.1234	Obs per group: min = 26				
Between = 0.6703	avg = 26.0				
Overall = 0.1451	max = 26				
Wald chi2 (1) = 31.58					
corr(u_i, X) = 0 (assumed)	Prob > chi2	= 0.0000			
ROA	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]
DivRatio	.2654451	0.0472341	5.62	0.000	.1728681 .3580222
_cons	1.101233	0.0129758	84.87	0.000	1.075801 1.126665

**Source: Researcher 2025**

#### 4.10 Hypothesis Testing

##### 4.10.1 Test of Hypothesis for Direct effects of Independent Variables on ROA

It was essential to determine the direct effects of the independent variables on the dependent variables. To actualize this, random effects regression model was run for Board Size, Women Size and Financial Expertise on the ROA while controlling for

the effects of Fund Age and FundSize which are the control variables. The results for the regression are as shown in table 4.9.

The overall R-squared value for the model is 0.7889 which implies that approximately 78.89% of the variation in ROA is explained by the independent variables and shows the fitness of the model. The within values are 0.7726 indicates that 77.26% of the variation in ROA within the same group i.e. year is explained by the model. . The between R-squared value of 0.9534 suggests a high explanatory power both within and between groups. The Wald chi-squared statistic of 751.05 with a p-value of 0.0000, confirms that the model is statistically significant, indicating that the independent variables collectively have a meaningful effect on ROA.

The findings on Board Size show a positive and significant relationship with ROA, with a coefficient of 0.0193 meaning that for each additional increase in a board member, ROA increases by 0.0193. The standard error of 0.0071474, the z-value of 2.70 and the p-value of 0.007 emphasize the importance of board size in influencing firm performance. The 95% confidence interval for this coefficient is between 0.0052859 and 0.033303 suggesting a reliable positive impact. The finding implies that having a larger board may contribute to better financial performance of pension funds. The conversation on the size of the board has been a major topic of research with findings presenting different conclusions. The results for this study has supported the findings of Coles, Daniel, and Naveen (2008) who found that that larger boards are often beneficial for complex firms that require more diverse knowledge to manage multiple business lines.

The Coefficient of Women size (WoSize) of 0.0007 shows that a one-unit increase in the proportion or size of women on the board or in the increases ROA by 0.0007 is

associated with a 0.0007 increase in ROA. Statistical Significance for Women Size is indicated by p-value = 0.022. The effect is significant at the 5% level, suggesting that greater gender diversity positively influences 95% Confidence Interval 0.0001 to 0.0013. These findings concur with Adams and Ferreira (2009) highlighted that greater female representation in corporate governance often leads to better monitoring and improved firm performance. Also Carter, D'Souza, Simkins, and Simpson (2010) emphasized that gender diversity enhances firm value by bringing different perspectives and increasing innovation, which might also support diversification efforts.

The Coefficient for board members with financial expertise is 0.0981 meaning that for each additional board member with financial expertise, ROA increases by 0.0981. Statistical Significance p-value = 0.005 which is less than the 0.05 thresh-hold. The relationship is significant at the 1% level, indicating that financial expertise on the board positively and significantly impacts fund performance. This finding highlights the importance of financial

***H<sub>01</sub>: Board of trustees' size has no significant effect on the financial performance of Pension funds of Universities in Kenya***

The study tested this hypothesis and from the findings, the board of trustees' size had a positive and significant effect on the ROA ( $\beta = 0.1305916$ ,  $\rho < 0.05$ ). The p-value of 0.0001 is less than 0.05 % thresh-hold. This means that we reject the Null hypothesis that Board Size has no significant effect on the financial performance of Universities Pension Funds in Kenya and we accept the alternative hypothesis that Board Size of Board of Trustees has a significant effect on the financial performance of the Universities Pension Funds in Kenya. Z-Value (3.43) indicates that the coefficient for

Board Size is 3.43 standard errors away from zero and gives us more reason to reject the null hypothesis and accept the alternative hypothesis. We can therefore conclude that there is statistically significant evidence to conclude that the size of the board of trustees has a significant effect on the financial performance (measured by ROA) of Pension funds of Universities in Kenya. This supports the findings of Coles, Daniel, and Naveen (2008) who found that larger boards are often beneficial for complex firms that require more diverse knowledge to manage multiple business lines. Tijjani (2012) through a research of pension funds in Nigeria found that board size is an important aspect of board characteristics and that it had a positive impact on the sustainability of a pension fund.

***H<sub>02</sub>: Gender diversity in the board of trustees has no significant effect on the financial performance of Pension funds of Universities in Kenya.***

A look at WoSize size (table 4.9) shows that  $\beta = 0.0122481$ ,  $p < 0.05$ . The p value of 0.025 is less than 0.05 showing that the gender has a significant effect on ROA. The inclusion of one woman in the board increases ROA by 0.0006797 units. This therefore means that we reject the null hypothesis which states that gender diversity has no significant effect on the financial performance and accept the alternative hypothesis that gender diversity and especially the representation of women in the board of trustees has a significant effect on the financial performance of Universities pension funds in Kenya. This is emphasized by the positive z-value of 2.25. There is empirical evidence suggesting that including women on the board of trustees positively affects the financial performance of university pension funds in Kenya. While previous research has presented mixed results on this topic, the conclusions of this study concur with several others.

Specifically, this study's findings align with those of Ongore et al. (2015), who found that gender diversity significantly influenced the financial performance of companies listed on the Nairobi Securities Exchange. Similarly, Kevin et al. (2008) observed a positive effect of gender diversity on firm value in Spain. Simpson et al. (2010) also support this, suggesting that a greater presence of women may encourage more participative communication among board members.

The study's conclusions align with those of Gyapong et al. (2016). Their research suggested that including female, ethnic minority and foreign national individuals on corporate boards can boost board diversity by introducing a wider range of expertise, ideas, talents, skills, work ethic, backgrounds, and experience. This increased diversity, in turn, has the potential to enhance both board independence and oversight

***H<sub>03</sub>: Financial expertise of board of trustees has no significant effect on the financial performance of Pension funds of Universities in Kenya***

From the findings as shown on table 4.8.4, it can be seen that for Financial expertise has coefficient of  $\beta = 0.1123787$ ,  $p < 0.05$ . The p value of 0.005 is less than 0.05 showing that the variable FinExp has a significant effect on ROA. The z-value for FinExp is 2.79 which is a strong positive. Given that p-value of 0.005 and z-value of 3.79 shows that the FinExp is statistically significant, we then reject the null hypothesis that financial expertise of board of trustees has no significant effect on the financial performance of Pension funds of Universities in Kenya and accept the alternative hypothesis that financial expertise of the board of trustees has a positive effect on the financial performance of Universities pension funds in Kenya. For every unit increase in financial expertise, the financial performance increases by 0.0981211 units. The importance of financial expertise in the board cannot be over-emphasized.

Guner et al. (2008) contend that board members possessing financial expertise play a significant role in shaping the finance and investment policies of the firms they oversee. Supporting this, Johl et al. (2015) identified a positive and statistically significant relationship between accounting expertise and financial performance. Furthermore, Andonov et al. (2016) found financial literacy to be a key factor in determining the performance of pension fund boards.

**Table 4. 16: Regression results Independent Variables on ROA**

to u<sub>i</sub>)

ROA	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
FundAge	0.0371323	0.0096801	3.84	0.000	0.0181596	.0561051
FundSize	5.816681	0.4993556	11.65	0.000	4.837962	6.795399
DivRatio	0.1645735	0.0387224	4.25	0.000	0.0886791	0.240468
BDSIZE	0.1305916	0.0380234	3.43	0.001	0.0560672	0.2051161
WoSize	0.0122481	0.0054498	2.25	0.025	0.0015667	0.0229295
FinExp	0.1123787	0.0284502	3.95	0.000	0.0566174	0.16814
_cons	0.316715	0.0319435	9.91	0.000	0.254107	0.379323
<hr/>						
sigma_u	0	sigma_e	.05239292	rho	0 (fraction of variance due to u <sub>i</sub> )	

Source: Researcher 2025

#### 4.10.2 Regression Results of Independent Variables on Mediator

A regression model was run to test the direct effects of the independent variables Board Size, Women Size and Financial expertise on the mediator which is portfolio diversification as shown by diversification ratio.

***H<sub>04</sub>: Board of trustee size has no significant effect on portfolio diversification of pension funds of universities in Kenya***

The regression outcomes show that Board Size (BDSize) had a significant but negative effect on the diversification ratio (p-value = 0.000). The coefficient of -0.2879 suggests that for every unit increase in board size, the diversification ratio decreases by 0.2879. This finding contradicts the null hypothesis (H<sub>04</sub>), as the effect of board size on diversification is statistically significant. The t- statistic for board size is -6.51 which indicates that large boards negatively affect portfolio diversification. Therefore, we reject H<sub>04</sub> and conclude that board size significantly affects the portfolio diversification of university pension funds in Kenya. The negative relationship suggests that larger boards might lead to inefficiencies in decision-making, potentially reducing the extent of diversification. These findings concur with Odhiambo. (2016) found that certain aspects of board diversity, including educational level and professional experience, positively influenced financial performance, while factors like gender and average age had a negative correlation. Also these findings support past study findings which support the relevance of board size in influencing a fund's investment decisions including portfolio diversification. Larger boards can suffer from coordination issues and lower efficiency, potentially leading to less optimal diversification strategies. According to Adams & Ferreira, (2020), Kweh et al (2021), large boards may hinder effective decision-making and responsiveness, negatively impacting financial performance and risk. Moreover, smaller boards are often associated with stronger oversight and more cohesive decision-making, which can enhance portfolio management Harris & Raviv, (2018). Thus, the evidence aligns

with the findings of this analysis, suggesting that a smaller size might foster better portfolio diversification practices in pension funds.

***H<sub>05</sub>: Gender diversity of the board of trustee has no significant effect on portfolio diversification of pension funds of universities in Kenya.***

The coefficient for Women Size (proportion of women on the board of trustees) is -0.0259, indicating a negative effect on portfolio diversification the standard error is 0.0015129, with a t-statistic of -2.06 and a p-value of 0.042. Given that the p-value is less the normal significance threshold 0.05, then we can conclude that women size or gender diversity affects portfolio diversification. This therefore means that we reject the Null hypothesis H<sub>05</sub> that board gender diversity doesn't have a significant effect on portfolio diversification and accept the alternative hypothesis that gender diversity has a significant effect on portfolio diversification. There have been mixed research findings, some reporting positive relationship and others a negative relationship between gender and performance. Among those who found a positive relationship include Liu et al. (2014) who averred that there are positive benefits of gender balanced boards on a firm's performance. Other researchers who have explored aspects of board diversity and financial performance include Carter et al. (2010), Rose (2007), and Abad and Saona (2022), though their findings, especially regarding gender diversity, have often been mixed or context-dependent. For example, Jin et al. (2014) observed a negative relationship between firms with higher power concentrations and financial performance in less developed market regions of China. Interestingly, they found that this impact became insignificant in more developed market regions and firms with lower power concentration. Closer to the current study's context, Manyaga et al. (2020) found that board gender diversity had a

negative but significant influence on return on equity (ROE) across banks, suggesting that increased female representation, in that specific banking context, might negatively impact financial performance.

However, more recent research by Kandie et al. (2024), also conducted within Kenya, offers a different perspective. They found that board gender diversity serves as a beneficial mediator between capital structure and financial performance. This implies that diverse boards, particularly those with financial expertise, can positively influence financial outcomes by effectively mediating how capital structure impacts performance.

***H<sub>06</sub>: Financial expertise has no significant effect on portfolio diversification of pension funds of universities in Kenya***

The regression output provided for the effect of financial expertise on portfolio diversification which showed a positive coefficient of 0.0981211 and a statistically significant p-value = 0.005) suggesting that financial expertise significantly impacts portfolio diversification. For each unit increase of one person with financial expertise, there is an increase in diversification by 9.812%. This finding makes us reject the null hypothesis H<sub>06</sub> which posits financial expertise has no significant effect on portfolio diversification of pension funds of universities in Kenya and we accept the alternative hypothesis which indicates that financial expertise has positive effect on portfolio diversification of pension funds of universities in Kenya. These findings are in tandem with recent research findings of Andonov and Rauh (2020), Pagliaro, C., & Utkus (2020) Morales and Stewart (2022) who found that financial expertise of the

boards of pension funds have a significant effect on investment allocations and diversification.

**Table 4.17: Regression Results for Independent Variables on portfolio diversification**

<b>DivRatio</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>z</b>	<b>P&gt;z</b>	<b>[95% Conf. Interval]</b>	
BDSize	-.2879058	.0442372	-6.51	0.000	-.3746092	-.2012025
WoSize	-.0258975	.0127538	-2.03	0.042	-.0508944	-.0009005
FinExp	0.0981211	.0571375	-2.57	0.010	-.2590352	-.0350603
_cons	-.439848	.0566157	-7.77	0.000	-.5508127	-.3288834
<hr/>						
sigma_u	0	sigma_e	.10344745	rho	0 (fraction of variance due to u_i)	

**Source: Researcher 2025**

#### **4.11 Hypothesis Testing for Mediator on ROA**

*H<sub>07</sub>: portfolio diversification has no significant effect on the financial performance of Pension funds of Universities in Kenya*

The output from the regression of ROA against DivRatio in table 4.8.2 showed that the coefficient of DivRatio is 0.2654451 and a p-value =0.000 which shows a strong significance at 1%. The confidence interval for DivRatio between 0.1728681 and 0.358 reinforces this positive association as it does not contain zero. The findings strongly support the findings of past studies where diversification has been found to impact positively the performance of firms Smith, (2022), Garcia & Xu, (2021). Based on the findings, the null hypothesis that portfolio diversification has no significant effect on the financial performance of Pension funds of Universities in

Kenya was rejected. Consequently, the alternative hypothesis, which states that portfolio diversification has a significant effect on the financial performance of Pension funds of Universities in Kenya, was accepted.

#### **4.12 Mediating effect of Diversification on Financial Performance**

This research primarily sought to investigate how diversification acts as a mediator in the relationship between pension fund board characteristics and the financial performance of university pension funds in Kenya where Diversification ratio was used as the mediator. The study was conducted on three independent variables fund size, women size and financial expertise being mediated by the diversification ratio. Three direct effects were generated  $H_{01}$ ,  $H_{02}$ , and  $H_{03}$ . Three mediated effects were equally generated  $H_{08a}$ ,  $H_{08b}$ , and  $H_{08c}$

Using stata, the following command was used to generate the necessary paths to test for mediation

sem (M <- X) (Y <- M X), standardized nocapslatent

Where: M = Mediator, X= Independent variable and Y is the dependent variable

The first mediation hypothesis was:

***H<sub>08a</sub>: Portfolio Diversification does not mediate between board size and financial performance***

The data was imported into the Stata programme after which BDSIZE, DivRatio and ROA variables were fed into the relationship  $sem (M <- X) (Y <- M X)$ , and the command was Okayed. The Stata generated the output as given below in Table 4.18

Path 'a' is from the independent variable board size (BDSize) to the mediator (DivRatio). This path has a negative Coefficient of -0.526 and a p-value = 0.000. This shows that the relationship between board size and diversification ratio is statistically significant. The coefficient of -0.526 indicates that as board size (BDSize) increases, the diversification ratio (DivRatio) decreases by 0.526 units. Path 'b' runs from the mediator (DivRatio) to the dependent variable (ROA) with a coefficient of 0.032 and a p-value of 0.524 which means it is insignificant giving the notion that DivRatio does not have a strong or meaningful effect on ROA in this model. This interpreted is to mean that the level of diversification does not significantly impact returns on assets. The Direct Path from BDSize to ROA (c' path) has a Coefficient of 0.797 and p = 0.000) meaning that it is highly significant. This means that there is a strong direct effect of board size on ROA. The insignificant path from DivRatio to ROA (b path) indicates that there is no meaningful mediation effect of DivRatio between BDSize and ROA. The relationship between board size and return on assets is primarily direct. Given that the insignificant path from DivRatio to ROA (b path) indicates that there is no meaningful mediation effect of DivRatio between BDSize and ROA. The relationship between board size and return on assets is primarily direct. This means that we accept the null hypothesis that Portfolio Diversification does not mediate the relationship between board size and financial performance of universities pension schemes in Kenya. This collates with Coles et al. (2021) who found similar results and said that large boards often pursue more conservative strategies, limiting diversification in favour of stable and core investments. Also Rumelt (2022) found that diversification does not universally enhance firm value and may, in some cases, detract from firm performance due to inefficiencies and complexities.

**Table 4. 18: Test of Hypothesis H<sub>08a</sub> results**

Standardized Structural DivRatio <-	Coef	Std. Err.	z	P>z	[95% Conf. Interval]	
BDSIZE	-.5261352	.0465443	-11.30	0.000	-.6173603	-.4349101
_cons	-4.092529	.5605291	-7.30	0.000	-5.191146	-2.993913
-----+-----						
ROA <-						
DivRatio	.0324635	.0509772	0.64	0.524	-.06745	.1323769
BDSIZE	.7970489	.0342464	23.27	0.000	.7299272	.8641706
_cons	3.332868	.4691569	7.10	0.000	2.413338	4.252399
var(e.DivRatio)	0.7231818	.0489772			.6332865	.8258377
var(e.ROA)	0.3908867	.0352994			.3274782	.4665728

LR test of model vs. saturated: chi2 (0) = 0.00, Prob > chi2 =

**Source: Researcher 2025**

***H<sub>08b</sub>: Portfolio Diversification does not mediate between board gender diversity and financial performance of universities pension funds in Kenya***

The null hypothesis in this analysis posits that Portfolio Diversification does not mediate the relationship between board gender diversity and financial performance of Universities pension funds in Kenya. This output investigates the relationships among WoSize, DivRatio, and ROA, considering DivRatio as the mediator that will channel the effects of WoSize on ROA and to see whether we accept the null hypothesis or reject it. Path 'a' from WoSize to DivRatio (a path) has a coefficient of -0.264 which is statistically significant ( $p = 0.000$ ), indicating that as the representation of women on the board (WoSize) increases, the diversification ratio (DivRatio) tends to decrease. This finding suggests that gender-diverse boards might focus more on core operations rather than on diversification strategies, as they appear less inclined toward diversification when female representation is higher. Path 'b' from DivRatio to ROA has a coefficient of -0.300 which is also statistically significant ( $p = 0.000$ ), this result

implies that higher diversification (DivRatio) is linked to lower ROA. This negative relationship indicates that diversification strategies may not be beneficial for firm performance. Direct Path from WoSize to ROA (c' path) has a positive coefficient of 0.330 which is statistically significant ( $p = 0.000$ ). This finding suggests a strong and direct effect of WoSize on ROA. This result supports the idea that an increased female presence on the board correlates with enhanced firm performance directly, aside from any impact of diversification. Given the significant relationships from WoSize to DivRatio and from DivRatio to ROA, there is enough evidence of an indirect effect of WoSize on ROA through DivRatio, indicating partial mediation. This outcome leads us to reject the null hypothesis that Portfolio Diversification does not mediate between board gender diversity and the financial performance of university pension funds in Kenya. As a result, we accept the alternative hypothesis, concluding that Portfolio Diversification does indeed mediate between board gender diversity and the financial performance of university pension funds in Kenya. These findings agree with the findings of Adams and Patricia (2012) who found that women on boards may favour less risky strategies, often prioritizing core activities over diversification, and generally discourage excessive risk-taking.

**Table 4. 19: Test of Hypothesis H<sub>08b</sub> results**

sem (DivRatio <- WoSize) (ROA <- DivRatio WoSize), standardized nocapslatent  
Endogenous variables

Observed: DivRatio ROA

Exogenous variables

Observed: WoSize

Fitting target model:

Iteration 0: log likelihood = 88.740883

Iteration 1: log likelihood = 88.740883

Structural equation model                      Number of obs      =      208

Estimation method = ml

Log likelihood      = 88.740883

OIM

Standardized	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]
<b>Structural</b>					
DivRatio <-					
WoSize	-.2638916	.0633759	-4.16	0.000	-.3881061 -
.139677					
_cons	-7.007739	.4536139	-15.45	0.000	-7.896806 -
6.118672					
<b>ROA &lt;-</b>					
DivRatio	-.2998892	.05991	-5.01	0.000	-.4173106 -
.1824677					
WoSize	.3296915	.0578138	5.70	0.000	.2163785
.4430045					
_cons	5.369747	.6457637	8.32	0.000	4.104073
6.63542					
var(e.DivRatio)	.9303612	.0334487			.8670594
.9982846					
var(e.ROA)	.7491876	.0505615			.6563633
.8551393					

LR test of model vs. saturated: chi2(0) = 0.00, Prob > chi2 = .

***H<sub>08c</sub>: Portfolio Diversification does not mediate between financial expertise and financial performance of pension funds of universities in Kenya***

The null hypothesis of this analysis proposes that diversification, represented by the diversification ratio (DivRatio), does not mediate the relationship between financial

expertise on the board (Finexp) and return on assets (ROA). This hypothesis was tested by examining the relationships between Finexp, DivRatio, and ROA, with a focus on whether DivRatio channels any indirect effects from Finexp to ROA. The Path from financial expertise (Finexp) to diversification ratio (DivRatio) (a path) has a coefficient of -0.226 ( $p = 0.000$ ), indicating a statistically significant negative relationship. This result informs us that as financial expertise on the board increases, the level of diversification (DivRatio) tends to decrease. Boards with financial expertise may prioritize core business operations over diversification. This aligns with findings by Chen and Ho (2021), who observed that boards with strong financial acumen often adopt risk-averse strategies, focusing on optimizing existing operations rather than diversifying into unrelated areas. The Path from DivRatio to ROA (b path) has a coefficient of -0.293 ( $p = 0.000$ ) which shows a statistically significant but negative relationship between diversification and ROA. Higher diversification is connected with a decline in ROA, suggesting that diversification may dilute the firm's focus and resources. This is supported by Lee and Li (2020), who found that excessive diversification, can reduce a firm's return on assets by diverting resources away from primary business activities. Direct Path from Finexp to ROA (c' path) has coefficient of 0.418 ( $p = 0.000$ ), indicating a significant positive effect of financial expertise on ROA. This suggests that increased financial expertise on the board directly enhances firm funds. Tsui and Lam (2019) similarly concluded that boards with financial expertise generally contribute to better financial performance through prudent fiscal management and efficient resource allocation. The significance of both the Finexp to DivRatio path and the DivRatio to ROA path indicates an indirect effect of Finexp on ROA through DivRatio, implying partial mediation. This means that we reject the null hypothesis  $H_{0c}$  that Portfolio Diversification does not mediate between

financial expertise and financial performance of pension funds of universities in Kenya and we accept the alternative hypothesis that portfolio diversification mediates between financial expertise and financial performance of universities pension funds in Kenya.

**Table 4. 20: Test of Hypothesis H<sub>08c</sub> results**

sem (DivRatio <- FinExp) (ROA <- DivRatio FinExp), standardized nocapslatent						
Endogenous variables						
Observed: DivRatio ROA			Exogenous variables			
Observed: FinExp			Fitting target model:			
Iteration 0: log likelihood = 441.00444			Iteration 1:log likelihood =			
441.00444						
Structural equation model			Number of obs = 208			
Estimation method = ml			Log likelihood = 441.00444			
OIM						
Standardized	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
Structural						
DivRatio <-						
FinExp	-.2259664	.0649518	-3.48	0.001	-.3532695	-.0986633
_cons	-6.99443	.4727285	-14.80	0.000	-7.920961	-6.067899
DivRatio						
FinExp	.4175954	.0521302	8.01	0.000	.315422	.5197687
_cons	4.950738	.6220714	7.96	0.000	3.7315	6.169975
var(e.DivRatio)	0.9489392	.0293538			.8931161	1.008251
var(e.ROA)	0.684833	.0509479			.5919156	.7923363
LR test of model vs. saturated: chi2 (0) =						

**Source: Researcher 2025**

#### 4.13 Sobel Test for significance

After running the mediation models for the three hypotheses H<sub>08a</sub>, H<sub>08b</sub> and H<sub>08c</sub>, it was necessary to confirm the mediation processes outlined above by carrying out a Sobel test to test the significance of the mediation by calculating the Sobel test statistic  $t$ . To use the Sobel model the Baron and Kenny conditions of 1986 must be met. These are: The independent variable (X) predicts the dependent variable i.e. ‘c’ must be statistically significant; the independent variable predicts the mediator (M); i.e. ‘a’ is statistically significant. The mediator (M) predicts the dependent variable (Y) while controlling for the effect of the independent variable (X); i.e., ‘b’ is statistically significant (Bader and Jones, 2021). Then, the Sobel test statistic is calculated

$$\frac{a*b}{\sqrt{(b^2 * SE_a^2) + (a^2 * SE_b^2)}}$$

For the first hypothesis showed that portfolio diversification does not mediate the relationship between Board size and ROA

To prove this the Sobel test statistic test was carried out at the 5% significance level the paths from the regression statistics were:

$a = -0.5261352$  = Effect of BDSize on DivRatio

$SE_a = 0.0465443$  for standard error Standard Error of a

$b = 0.0324635$  = Effect of DivRatio on ROA

$SE_b = 0.0509772$  = Standard Error of b

These variables coefficients 0.5261352, b=0.0324635 were then substituted in the

$$\text{Sobel formula } Z = \frac{-0.5261352 \times 0.0324635}{\sqrt{(0.0324635^2 * 0.0465443^2) + (-0.5261352^2 * 0.0509772^2)}}$$

$$Z = -0.636$$

The Z statistic was compared against a standard normal distribution (Z-critical values of  $\pm 1.96$  which correspond to a 5% significance level). Since  $-0.636$  to  $0.636$  is within the range  $-1.96$  to  $1.96$  the mediation effect is not statistically significant at the 5% level. Then these results confirm that the Diversification ratio does not mediate the relationship between Board Size and Return on Assets for universities pension funds in Kenya.

The second Z statistic was to confirm the results of the second alternative hypothesis that portfolio diversification mediates the relationship between gender diversity as represented by women size and financial performance of universities pension schemes in Kenya. From the regression statistics the paths and the standard errors were:

Coefficient 'a' =  $-0.2661196$  Standard error (SEa) =  $0.06327610$

Coefficient 'b'  $-0.2983609$  • Standard error SEb =  $0.0599130$

Substituting these values in the Sobel test equation

$$Z = \frac{a*b}{\sqrt{(b^2 * SEa^2) + (a^2 * SEb^2)}}$$

$$Z = \frac{-0.2661196 \times 0.06327610}{\sqrt{(-0.2983609^2 * 0.06327610^2) + (-0.2661196^2 * 0.0599130^2)}}$$

From the above, The Sobel test statistic (Z) is approximately 3.213.

From the standard normal distribution, the critical values for the 5% significance level lie between  $\pm 1.96$ . It was therefore inferred that since the Z value of 3.213 lies above +1.96 means that the result is statistically significant at the 5% level. This confirms that that the Diversification ratio significantly mediates the relationship between Women Size (WoSize) and Return on Assets (ROA) in the universities pension funds in Kenya.

The third Z statistic was calculated to confirm that diversification ratio mediated the relationship between financial expertise (FinExp) and return on assets (ROA) of universities pension funds in Kenya.

From the regression results the paths and their coefficients were as follows.

Path 'a' coefficient =  $-0.2259664$  Standard error (SEa=  $0.06495180$ )

Path 'b' Coefficient =  $-0.2925295$  Standard error (SEb=  $0.05700070$ )

These regression results were then substituted in the Sabel z-test equation.

$$Z = \frac{a*b}{\sqrt{(b^2 * SEa^2) + (a^2 * SEb^2)}}$$

$$Z = \frac{-0.2259664 \times -0.2925295}{\sqrt{(-0.2925295^2 * 0.06495180^2) + (-0.2259664^2 * 0.05700070^2)}}$$

The Sobel test above gives us a Z statistic of 2.880. This Z value is above the critical value of 1.96 at the 5% significance level. This statistics depict that the mediation effect of Diversification Ratio between Financial Expertise and ROA is statistically significant. It was therefore emphatically concluded that diversification ratio mediates the relationship between financial expertise and financial performance (ROA) of universities pension funds in Kenya.

## **4.14 Discussion of the findings**

### **4.14.1 Descriptive statistics**

The descriptive statistics provide a comprehensive summary of the key research variables, offering insights into the distribution, central tendency, and variability of the data. A total of 208 observations were analyzed, representing data from 26 Kenyan university pension funds over 8 years.

The mean board size was 7 trustees, consistent with findings from Loh and Nguyen (2018), indicating that boards typically comprise around 7 members. The minimum board size was 4, and the maximum was 14 trustees, with a standard deviation of 1.204. This relatively low standard deviation suggests moderate clustering of observations around the mean, indicating minimal deviation in board size across the sample. The mean number of women on the boards was 2, with a range of 1 to 5. The standard deviation of 0.823 is low, suggesting that most boards have a similar representation of women. Skewness (0.472) and kurtosis (3.086) indicate a slight asymmetry and a near-normal distribution of the data. These metrics suggest consistent female representation across boards. Boards had an average of 3 trustees with financial expertise, with a range of 1 to 5. The standard deviation was 1.135, indicating moderate variability. The skewness (1.105) and kurtosis (3.725) coefficients highlight a positive skew and a sharper peak, suggesting that most boards had fewer financially expert members, with occasional instances of higher expertise representation. The mean ROA was 0.0880 (8.8%), with values ranging from -0.00678 to 0.2148. The standard deviation of 0.0223 indicates moderate variability in profitability, reflecting differences in operational efficiency and asset management among the pension funds. The mean Diversification Ratio was 0.0599, with a standard

deviation of 0.0288. The range (-0.00678 to 0) suggests low variability, indicating relatively consistent diversification strategies across pension funds. The mean fund age was 17.54 years, with ages ranging from 1 to 55 years? The standard deviation of 12.074 indicates substantial variability in the age of pension funds, reflecting a mix of well-established and newer funds. This variability is indicative of diverse institutional histories. The mean fund size was Ksh 24.2B, with a standard deviation of 3.78B, reflecting significant dispersion in fund sizes. The range, from Ksh 13.9M to Ksh 17.4B, underscores disparities in fund capitalization, with some institutions managing significantly larger funds than others.

#### **4.14.2 Effect of control variables on Financial Performance**

The results of the regression analysis reveal that the control variables i.e. Fund Age and Fund Size play a significant role in explaining variations in both financial performance (ROA) and portfolio diversification among university-based pension funds in Kenya. The model assessing their effect on ROA was statistically significant, as indicated by a Wald  $\chi^2$  value of 539.91 ( $p = 0.0010$ ), demonstrating that the control variables jointly exert a meaningful influence on financial outcomes. The R-squared value of 0.6773 suggests that approximately 67.73% of the variation in ROA is accounted for by Fund Age and Fund Size, implying a strong explanatory power for the model. This highlights the importance of structural fund characteristics in determining overall financial performance and underscores the need to consider these variables in pension fund analyses.

The findings indicate that Fund Age has a negative and statistically significant effect on ROA, with a coefficient of  $-0.0403446$  ( $p = 0.001$ ). This implies that older pension funds tend to generate lower returns compared to their younger counterparts. Several

explanations may account for this pattern. Older funds are likely to have more established investment policies, which may be conservative due to accumulated liabilities and the need to maintain stable cash flows for benefit payments. Over time, such conservative investment strategies can limit the fund's ability to pursue higher-yielding or innovative investment opportunities, resulting in reduced financial performance. The negative association may also reflect inertia in decision-making or institutional rigidity that constrains adaptability in dynamic financial markets. The 95% confidence interval ( $-0.0638525$  to  $-0.0168367$ ) reinforces the robustness of this negative effect.

Conversely, Fund Size exhibited a positive and highly significant effect on ROA, with a coefficient of  $0.6635663$  ( $p < 0.000$ ). Larger pension funds appear to benefit from economies of scale, improved negotiating power with fund managers, and greater capacity to diversify into a broader range of asset classes. These advantages translate into more efficient investment management and enhanced financial performance. Larger funds may also attract better governance structures, superior risk-management frameworks, and access to specialized investment expertise, all of which contribute to superior returns. The narrow confidence interval ( $0.6001508$  to  $0.7269819$ ) further confirms the consistency of this positive relationship.

Similarly, the regression results for the control variables on the Diversification Ratio reveal that the model is statistically significant, with a Wald  $\chi^2$  value of  $99.86$  ( $p < 0.000$ ), indicating that Fund Age and Fund Size jointly explain a meaningful portion of the variation in diversification. The within, between, and overall R-squared values ( $0.3143$ ,  $0.7239$ , and  $0.3276$  respectively) suggest that while diversification varies across years, fund size differences between groups play a greater explanatory role.

Fund Age again showed a negative and significant effect (coefficient =  $-0.078383$ ,  $p = 0.002$ ), demonstrating that older pension funds tend to diversify less. This aligns with the earlier outcome on ROA, reinforcing the notion that mature funds prioritize conservative investment strategies and may be less inclined to adjust their portfolios in response to evolving market conditions.

On the other hand, Fund Size showed a positive and statistically significant effect on portfolio diversification, with a coefficient of  $0.6373008$  ( $p < 0.000$ ). This finding is consistent with established finance theory, which suggests that larger funds have greater resource capacity and operational flexibility to spread investments across multiple asset categories. The ability to diversify more effectively reduces risk exposure and enhances overall financial stability. The wide differential between small and large funds, as highlighted by the confidence interval ( $0.5059007$  to  $0.7687009$ ), demonstrates clear advantages enjoyed by larger pension funds in building diversified and resilient investment portfolios.

Overall, the findings emphasize that Fund Age and Fund Size are critical structural determinants of pension fund performance and behavior. Fund Age tends to constrain both financial performance and diversification through conservative investment postures, while Fund Size enhances both through resource advantages and greater portfolio flexibility. These insights underline the necessity of controlling for these variables to obtain accurate and unbiased estimates when assessing the influence of governance characteristics or other strategic factors on pension fund outcomes.

#### **4.14.3 Effect of board size on financial performance**

Board size (BDSIZE) is a crucial factor impacting the financial performance of organizations, often assessed using Return on Assets (ROA). This study found a

positive and significant relationship between board size and ROA for university pension funds in Kenya. The results indicate that for every unit increase in board size, ROA improves by approximately 0.0192945. With a p-value of 0.0007, which is well below the 0.05 significance threshold, the null hypothesis stating that board size has no significant impact on the financial performance of university pension funds in Kenya was rejected. This provides strong evidence that larger boards are associated with better financial performance in these funds. The Z-value of 2.70, reflecting that the coefficient is 2.70 standard errors away from zero, further reinforces the statistical significance of this relationship. These results align with the findings of Coles, Daniel, and Naveen (2008), who concluded that larger boards provide strategic advantages for complex firms requiring diverse expertise to manage multiple business lines. Similarly, Tijjani (2012) found that board size positively impacts the sustainability of pension funds in Nigeria, emphasizing its role as an essential board characteristic. Fauzi and Locke (2012) further underscore the significant role that board size plays in enhancing both the monitoring and decision-making processes within organizations. They assert that these improved governance functions ultimately lead to superior financial outcomes. Larger boards often serve as a proxy for greater diversity in knowledge and resources according to Mwengei (2016). Larger boards are associated with enhanced oversight and diverse perspectives, enabling more effective monitoring and strategic input (Mohapatra & Pranati, 2017). Gyapong et al. (2016) and Terjesen et al. (2015) highlight that larger boards embody board diversity, incorporating social equity and equal opportunities, which improve organizational inclusivity. Corbetta and Salvato (2004) argue that larger boards bring varied expertise, which strengthens both monitoring and advisory roles. Maere et al. (2014) and Brédart (2014) further suggests that larger boards can counterbalance CEO

influence, enhancing governance and ensuring robust checks and balances. This aligns with the observation by Mohapatra and Pranati (2017) that larger boards provide better networking opportunities, a broader pool of expertise, and greater flexibility in scheduling committee meetings. While the benefits of larger boards are evident, some researchers caution against potential drawbacks. For instance, large boards may face communication and coordination challenges, which can hinder their effectiveness (Mahesh et al., 2020). Kutum (2015) found no significant relationship between board size and financial performance, suggesting that the benefits of a larger board may depend on contextual factors such as the industry, governance structure, and firm-specific characteristics. Nguyen et al. (2015) observed that larger boards in Australian firms influenced CEO compensation more than financial performance, indicating that an increase in board size might not always translate to improved outcomes. This underscores the complexity of the relationship between board size and performance, necessitating a balanced approach to board composition. In conclusion, the findings of this study underscore the significance of board size in driving financial performance of pension funds of universities. Larger boards enhance diversity, expertise, and governance, which collectively contribute to better decision-making and oversight. However, because there is no universally accepted position on the relationship between board size and financial performance it then means that contextual and firm-specific factors play a critical role. Therefore, pension funds should consider their unique needs and governance structures when determining optimal board size.

#### **4.14.4 Effect of gender diversity on financial performance**

Gender diversity within boardrooms has emerged as a critical element of corporate governance, drawing significant attention due to its potential influence on financial

performance. In this study, the representation of women on boards of trustees demonstrates a positive and statistically significant effect on financial performance, as measured by Return on Assets (ROA). Specifically, the coefficient for WoSize (women's representation) was found to be 0.0006797. The corresponding p-value of 0.022, which is below the 0.05 significance threshold, provides sufficient statistical evidence to reject the null hypothesis that gender diversity has no impact on financial performance. Consequently, the alternative hypothesis, which posits that gender diversity positively affects financial outcomes, is supported by these findings. The Z-value of 2.30 further supports this conclusion, highlighting that each additional woman on the board increases ROA by 0.0006797 units. The findings of this study align with past research emphasizing the value of gender diversity on boards. Ongore et al. (2015) revealed a significant impact of gender diversity on the financial performance of firms listed on the Nairobi Securities Exchange. Kevin et al. (2008) similarly observed a positive relationship between gender diversity and firm value in Spain. Simpson et al. (2010) noted that greater female representation fosters more participative communication among board members, potentially enhancing decision-making processes. Gyapong et al. (2016) found that the strategic appointment of women, ethnic minorities, and foreign nationals to corporate boards goes beyond merely improving diversity. Their research indicates that such appointments actively enhance both board independence and monitoring capabilities. Furthermore, these diverse individuals significantly enrich the boardroom by introducing a wider array of expertise, skills, and perspectives, ultimately contributing to more robust governance. Mohammad et al. (2018) argued that diverse boards lead to better understanding of stakeholder needs, improved risk management, and enhanced overall governance. Despite increasing advocacy and attention, research exploring the connection between

gender diversity on boards and a firm's financial performance has, to date, produced inconsistent findings. For instance, Carter et al. (2010) found no significant relationship between board diversity and financial outcomes in U.S. Kutum (2015) and Mahesh et al. (2020) did not find significant relationships between gender diversity and financial performance of firms. Carter (2010) insinuated that these inconsistencies may be attributed to differences in cultural contexts, governance structures, and industry-specific factors. Diepen (2015) argued that understanding the relationship between gender diversity and firm performance is essential for assessing the effectiveness of gender quotas. Despite the mixed outcomes of gender diversity, Hirschman (1970) and Terjese et al (2016) have emphasized the broader benefits of gender diversity, including improved trust, stakeholder representation, and ethical governance. In conclusion, this study contributes to the growing body of evidence that gender diversity, as measured by WoSize, positively influences financial performance. The inclusion of women on boards enhances governance, fosters diverse perspectives, and drives better decision-making. While challenges and mixed findings persist, the weight of evidence supports the strategic importance of gender diversity in improving organizational outcomes. Efforts to increase female representation on boards should be viewed as not only a matter of equity but also as a driver of enhanced financial performance and long-term value creation.

#### **4.14.5 Effect of financial expertise on financial performance**

From the findings presented in Table 4.8, financial expertise (FinExp) of board members has a statistically significant and positive effect on financial performance, as measured by return on assets (ROA). The coefficient for FinExp is  $\beta = 0.0981211$ , with a p-value of 0.005, which is well below the 0.05 threshold for significance. The

z-value of 2.79 further underscores the strength of this relationship, demonstrating that the coefficient is 2.79 standard errors away from zero. These findings provide strong evidence to reject the null hypothesis that financial expertise of the board of trustees has no significant effect on the financial performance of Universities Pension Funds in Kenya. Instead, the alternative hypothesis is accepted, asserting that financial expertise positively influences financial performance. Specifically, for every unit increase in financial expertise, ROA increases by 0.0981211 units. These results align with prior research emphasizing the critical role of financial expertise in enhancing board effectiveness and overall organizational performance. Guner et al. (2008) highlight that board members with financial expertise significantly influence financial and investment policies. Similarly, Johl et al. (2015) observed a positive and statistically significant relationship between accounting expertise and financial performance specifically within Malaysian firms. Carcello et al. (2002) and Alzoubi and Selamat (2012) emphasize that a higher level of financial expertise enhances the board's motivation and capability to monitor the firm's operations. Andonov et al. (2016) observe that pension funds governed by boards with significant financial expertise achieve higher returns, particularly on complex investments like private equity. These findings underline the strategic value of appointing financially literate trustees to oversee pension fund management. The concept of financial expertise has been widely explored in corporate governance literature. According to the Sarbanes-Oxley Act of 2002, a financial expert is characterized by substantial experience and knowledge in financial accounting, internal controls, and audit committee functions. This definition underscores the relevance of financial literacy for ensuring effective monitoring and decision-making in organizations. Robert and Clifford (2004) assert that financial expertise is a defining characteristic of professionalism, requiring

adherence to codes of conduct, research-based knowledge, and continuous professional development. Boards with financially literate members are better positioned to assess risks, scrutinize financial reports, and ensure regulatory compliance, thereby boosting stakeholder confidence (Hasyudeen, 2003). While the positive impact of financial expertise is well-documented, some studies present contrary evidence. Kutum (2015) found no significant relationship between financial expertise and firm performance, suggesting that contextual factors may mediate the effectiveness of expertise. For instance, organizations with robust governance structures may perform well irrespective of board expertise. Given the findings of this study and supporting literature, universities and pension funds in Kenya should prioritize financial expertise in their board recruitment processes. Enhancing the financial literacy of board members through targeted training programs can also improve decision-making and accountability. Additionally, regulators may consider setting minimum financial literacy standards for trustees managing public pension funds to safeguard stakeholders' interests. In conclusion, the significant and positive relationship between financial expertise and financial performance demonstrated in this study reaffirms the importance of appointing financially literate trustees. This aligns with global best practices and highlights a critical pathway for improving the financial health of pension funds and other organizational entities.

#### **4.14.6 Effect of Portfolio Diversification on financial performance**

Harry Markowitz's seminal Modern Portfolio Theory (1952) laid the fundamental groundwork for understanding diversification. This theory proposed diversification as a critical strategy for investors to maximize returns for a given level of risk by constructing portfolios comprised of assets that are not perfectly correlated. In

essence, it emphasized that by combining a variety of unrelated assets, investors could reduce overall portfolio risk without necessarily sacrificing expected returns. This principle resonates with the findings of this study, particularly the regression analysis, where the portfolio diversification as indicated by diversification ratio (DivRatio) exhibited a positive and significant impact on the financial performance of pension funds with coefficient = 0.265, p-value < 0.05). These results align with Iraya et al. (2018), who emphasized that holding uncorrelated assets mitigates the adverse effects of poor performance in one asset class by balancing gains from others. Pula et al. (2012) supports these observations, asserting that optimal allocation of securities across different asset classes enhances returns and lowers risk. The results of this study led to the rejection of the null hypothesis that diversification has no significant effect on the financial performance of universities pension funds in Kenya and led to accepting the alternative that diversification has a significant effect on the financial performance of universities pension funds in Kenya. These findings further substantiate claims by Purkayastha et al. (2012) that diversification reduces organizational earnings variance and facilitates efficient resource allocation. The findings of this reinforce Smits (2011) and Ngugi et al. (2018), who noted the importance of strategic diversification in pension fund investments. Smits (2011) identified bonds, equities, and real estate as dominant asset classes, with balanced investment strategies critical for managing risk and meeting pension liabilities. Similarly, Ngugi et al. (2018) emphasized that investment strategies not only secure retirement incomes but also catalyze capital market development. Similarly, the positive association between diversification and financial performance is consistent with the arguments of Kamwaro (2013) and Kimeu (2015), who found that investments in bonds, shares, and real estate positively impact financial performance

of pension funds in Kenya. Additionally, Bikker and Dreu (2009) highlighted that administrative costs decrease proportionally with increased fund size due to economies of scale, further enhancing the net benefits of diversification. Similar findings on the positive impact of diversification were found by Smith (2022) and Garcia & Xu (2021). The results of these findings illustrate how strategic portfolio management can yield superior financial outcomes in the universities pension funds in Kenya supporting the claims of Palich et al. (2000) and Teece (1980) that diversification enables firms to exploit economies of scale and achieve stability through uncorrelated revenue streams.

#### **4.14.7 Mediating effect of Portfolio Diversification on Board Characteristics**

The main essence of the study was to test whether portfolio diversification mediates between board characteristics and financial performance of universities pension funds in Kenya. When regression was done, the analysis revealed no significant mediating effect of diversification between board size (BDSize) and financial performance (ROA). Path "a," from BDSize to DivRatio, demonstrated a negative and statistically significant relationship ( $\beta=-0.526$ ,  $p=0.000$ ), suggesting that larger boards tend to reduce diversification efforts. However, Path "b," linking DivRatio to ROA, is insignificant ( $\beta=0.032$ ,  $p=0.524$ ), indicating that diversification does not have a meaningful impact on ROA. Despite this, the direct path ( $c'$ ) between BDSize and ROA is highly significant ( $\beta=0.797$ ,  $p=0.000$ ), revealing a strong direct positive effect. To further validate these findings, the Sobel test was conducted to assess the significance of the indirect effect. The test statistic ( $Z$ ) was computed and compared to the critical values of  $\pm 1.96$  (at a 5% significance level). The result ( $Z=-0.636$ ) falls within the range of  $-1.96$  to  $1.96$ , confirming that the indirect effect of BDSize on

ROA through DivRatio is not statistically significant. These results align with previous findings, such as those by Coles et al. (2021), which suggest that larger boards often adopt conservative strategies, favoring core investments over diversification. Therefore, diversification does not significantly mediate the relationship between board size and financial performance in the light of Universities pension funds.

The analysis of whether diversification ratio mediates the relationship between board gender diversity and financial performance demonstrates that diversification (DivRatio) partially mediates the relationship between board gender diversity (WoSize) and financial performance, as measured by return on assets (ROA). Path "a" shows a significant negative relationship between WoSize and DivRatio ( $\beta=-0.266$   $p=0.000$ ), indicating that boards with higher female representation tend to engage in lower levels of diversification. This finding suggests that gender-diverse boards may prioritize risk-averse strategies, focusing more on core business operations than on expansive diversification efforts. Path "b" highlights a negative and statistically significant relationship between DivRatio and ROA ( $\beta=-0.298$   $p=0.000$ ) revealing that higher levels of diversification are associated with lower financial performance. This result implies that diversification strategies, as applied in the context of university pension funds, may dilute focus and resources, negatively affecting profitability. The direct effect (Path c') of WoSize on ROA is positive and significant ( $\beta=0.333$ ,  $p=0.000$ ), indicating that gender-diverse boards enhance financial performance directly. This positive influence underscores the benefits of having more women on boards, possibly due to diverse perspectives, improved governance, and more cautious decision-making. The Sobel test was conducted to assess the statistical

significance of the mediation effect. With a Z-value of 3.213, exceeding the critical value of  $\pm 1.96$  at the 5% significance level, the results confirm that diversification significantly mediates the relationship between Women Size and ROA. The mediation is partial, as WoSize retains a significant direct effect on ROA even when DivRatio is accounted for. These findings align with prior research, such as Adams and Ferreira (2012), which suggested that women on boards often favor less risky and more focused strategies, contributing positively to organizational outcomes. The study thus rejects the null hypothesis and concludes that diversification significantly mediates the relationship between board gender diversity and financial performance in the context of university pension funds in Kenya. Moreover, the negative relationship between diversification and ROA supports the assertions of Lee and Li (2020), who argued that excessive diversification, can lead to managerial inefficiency and a dilution of strategic focus. By limiting diversification, gender-diverse boards may enhance operational efficiency and financial performance, reinforcing the positive direct effect of WoSize on ROA.

The analysis of the relationship between financial expertise, portfolio diversification and financial performance reveals that diversification (DivRatio) partially mediates the relationship between financial expertise (Finexp) on boards and financial performance, measured by return on assets (ROA). Path "a" shows a significant negative relationship between Financial expertise and DivRatio ( $\beta = -0.250$ ,  $p = 0.001$ ) suggesting that boards with greater financial expertise are less inclined toward diversification. This finding indicates that financially skilled boards prioritize optimizing core business operations over pursuing broader diversification strategies. This aligns with Chen and Ho (2021), who found that boards with strong financial

expertise often adopt risk-averse and efficient operational strategies. Path "b" demonstrates a significant negative relationship between DivRatio and ROA ( $\beta=-0.280$ ,  $p=0.000$ ), confirming that higher diversification levels are associated with lower financial performance. This result suggests that diversification strategies may detract from the efficiency and focus needed for maximizing financial outcomes, consistent with studies such as Lee and Li (2020), which highlight the potential downsides of excessive diversification. The direct effect (Path c') from Finexp to ROA is positive and significant ( $\beta=0.310$ ,  $p=0.000$ ), indicating that financial expertise enhances financial performance directly. This finding underscores the importance of having financially skilled individuals on boards, as they contribute to better financial outcomes through prudent decision-making and effective resource allocation. The Sobel test further supports the mediation effect of Diversification Ratio between Financial expertise and ROA. The Z statistic of 2.880 exceeds the critical value of  $\pm 1.96$  at the 5% significance level, confirming that the mediation effect is statistically significant. While diversification mediates the relationship, the persistence of a significant direct effect (Path c') suggests partial mediation. Overall, these results validate the hypothesis that diversification mediates the relationship between financial expertise and financial performance in university pension funds making us reject the null hypothesis that portfolio diversification does not mediate the relationship between board financial expertise and financial management. This partial mediation emphasizes the dual role of financial expertise in directly driving financial performance and influencing diversification strategies, which in turn affect financial outcomes. These findings align with Tsui and Lam (2019), who highlighted the crucial role of financial expertise in achieving organizational efficiency and profitability through focused strategic decisions.

**Table 4. 21: Summary of Hypotheses Tested**

<b>Hypothesis</b>	<b>Estimation Method</b>	<b>test statistic</b>	<b>Decision</b>
<b>H<sub>01</sub></b> : Board of trustees' size has no significant effect on the financial performance of Pension funds of Universities in Kenya	Random Effect	$\beta = -0.0193$ $p = 0.001$	$p < 0.05$ Reject Null Hypothesis
<b>H<sub>02</sub></b> : Gender diversity of board of trustees has no significant effect on the financial performance of Pension funds of Universities in Kenya.	Random Effect	$\beta = 0.00068$ $p = 0.022$	$p < 0.05$ Reject the Null Hypothesis
<b>H<sub>03</sub></b> : Financial expertise of board of trustees has no significant effect on the financial performance of Pension funds of Universities in Kenya	Random Effect	$\beta = 0.0981$ $p = 0.005$	$p < 0.05$ Reject the Null Hypothesis
<b>H<sub>04</sub></b> : Board of trustee size has no significant effect the on portfolio diversification of pension funds of Hypothesis Universities in Kenya	Random Effect	$\beta = -0.1623$ $p = 0.000$	$p < 0.05$ Reject the Null Hypothesis
<b>H<sub>05</sub></b> : Gender diversity of the board of trustee has no significant effect on portfolio diversification of pension funds of universities in Kenya.	Random Effect	$\beta = -0.0259$ $p = 0.042$	$p < 0.05$ Reject the Null Hypothesis
<b>H<sub>06</sub></b> : Financial expertise has no significant effect on portfolio diversification of pension funds of Universities in Kenya	Random Effect	$\beta = 0.4338$ $p = 0.001$	$p < 0.05$ Reject the Null Hypothesis
<b>H<sub>07</sub></b> : portfolio diversification has no significant effect on the financial performance of Pension Funds of Universities in Kenya	Random Effect	$\beta = 0.4338$ $p = 0.000$	$p < 0.05$ reject the Null Hypothesis
<b>H<sub>08a</sub></b> : Portfolio Diversification does not mediate between board size and financial performance of pension funds of universities in Kenya	Sobel Test	$t = -0.636$	$t < 1.96$ Fail to reject the Null Hypothesis
<b>H<sub>08b</sub></b> : Portfolio Diversification does not mediate Board gender diversity and financial Performance of pension funds of universities in Kenya	Sobel Test	$t = 3.213$	$t > \pm 1.96$ Reject the Null hypothesis
<b>H<sub>08c</sub></b> : Portfolio Diversification does not mediate between financial expertise and financial performance of pension funds of universities in Kenya	Sobel Test	$t = 2.880$	$t > \pm 1.96$ Reject the Null hypothesis

## CHAPTER FIVE

### SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

#### 5.0 Introduction

This chapter gives a summary of the findings outlined in Chapter 4, conclusions made, recommendations to policy makers and recommendation for future research

#### 5.1 Summary of the findings

The central aim of this research was to investigate the mediating effect of portfolio diversification on the relationship between various characteristics of boards of trustees and the financial performance of university pension funds in Kenya. To achieve this overarching goal, the study was structured around several specific objectives: To examine the direct effect of board of trustees' size on the financial performance of university pension funds in Kenya; To assess the direct effect of gender diversity of the board of trustees on the financial performance of university pension funds in Kenya; To determine the direct effect of financial expertise among the board of trustees' members on the financial performance of university pension funds in Kenya; To evaluate the effect of board of trustee size on the portfolio diversification of the pension funds of universities in Kenya; To establish the effect of gender diversity of the board of trustees on the portfolio diversification of the pension funds of universities in Kenya; To determine the effect of financial expertise on the portfolio diversification of the pension funds of universities in Kenya; To assess the direct effect of portfolio diversification itself on the financial performance of pension funds of universities in Kenya; To examine the mediating effect of portfolio diversification on the relationship between board of trustee size and the financial performance of university pension funds in Kenya; To examine the mediating effect of portfolio

diversification on the relationship between gender diversity of the board of trustees and the financial performance of university pension funds in Kenya; and finally, to examine the mediating effect of portfolio diversification on the relationship between financial expertise of the board of trustees and the financial performance of university pension funds in Kenya.

### **5.1.1 Summary of descriptive statistics**

The descriptive statistics provide an overview of the key variables analyzed in the study of 208 observations from 26 Kenyan university pension funds over 8 years the statistics are summarized as follows: Board Size The mean board size was 7 trustees, ranging between 4 and 14 with a standard deviation of 1.204. This indicates moderate consistency across the sample, aligning with prior studies like Loh and Nguyen (2018). Women on Boards: Boards had a mean of 2 women ranging between 1 and 5 with standard deviation of 0.823, Skewness of 0.472 and kurtosis of 3.086. Financial Expertise had a mean number of 3 and a range between 1 and 5 with a standard deviation of 1.135. A positive skew of 1.105 kurtosis: 3.725 Return on Assets (ROA): The mean ROA was 8.8% (range: -0.00678 to 0.2148), with a standard deviation of 0.0223, showing moderate variability in financial performance among funds. Diversification Ratio had a mean of 0.0599, with a standard deviation of 0.0288. Fund Age of universities pension funds averaged 17.54 years with a wide range (1 and 55 years) and a high standard deviation (12.074), reflecting diverse institutional histories. Fund Size has a mean of Ksh 24.2 billion, but significant disparities ranging between Ksh 13.9 million to Ksh 17.4 billion as shown by the large standard deviation 3.78 billion.

### 5.1.2 Summary of the correlation Results

The correlation analysis examined the strength and direction of relationships between key variables in the study of 26 Kenyan university pension funds over an eight years period. Pearson correlation coefficients were used, with values ranging from -1 (strong negative correlation) to +1 (strong positive correlation). The following results were generated: first the control variables of fund age and fund size had the following results: Fund Age has a negative correlation of -0.5161 indicating that older funds generally have lower ROA, possibly due to less aggressive growth strategies. Fund Size has a positive correlation 0.8760 suggesting that larger funds perform better, likely benefiting from economies of scale and diversified portfolios. Board Size has a positive correlation of 0.7800 implying that larger boards enhance governance and decision-making, improving financial performance. Women Size has a positive correlation of 0.4121 indicating that gender diversity in leadership contributes positively to performance. Financial Expertise has a positive correlation (0.4942), suggesting that boards with financial expertise achieve better financial performance. Diversification Ratio has a negative correlation of -0.4181 reflecting that highly diversified funds may experience diluted returns compared to more focused strategies. Fund Age and Fund Size have a negative correlation of -0.6892 which shows that newer funds experiencing faster growth. Fund Size and Board Size show a positive correlation of 0.7889 indicating that larger funds require broader governance. Fund Size and Women Size show a positive correlation of 0.3640 depicting that larger funds slightly favor gender diversity. Fund Size and Financial Expertise show a positive correlation of 0.4420 showing that larger funds are more likely to engage financial experts in their boards. Fund Size and Diversification Ratio show negative correlation of -0.5079 suggesting that larger funds focus on core investments rather

than diversification. Board Size and Women Size have a positive correlation of 0.4412 showing larger boards tending to include more women, reflecting an inclination to more diversity. Board Size and Financial Expertise show a positive correlation of 0.3370 suggesting that larger boards may include more financial experts. Board Size and Diversification Ratio have a negative correlation -0.5546 indicating that larger boards focus on less diversified strategies. Women Size and Financial Expertise: positive correlation of (0.2839), suggesting a slight association between gender diversity and financial expertise. Women Size and Diversification Ratio had a negative correlation of -0.2824 implying that more gender-diverse boards may pursue slightly less diversification. Financial Expertise and Diversification Ratio had a negative correlation of -0.2321 which indicates that boards with financial expertise may prefer focused investment strategies over broader diversification.

### **5.1.3 Summary of Regression Results**

The findings demonstrate that the control variables i.e. Fund Age and Fund Size significantly influence both the financial performance and diversification behavior of university-based pension funds in Kenya. Fund Age was found to have a negative and statistically significant effect on ROA and Portfolio Diversification, suggesting that older funds tend to earn lower returns and pursue less diversified investment strategies. This pattern is likely linked to conservative investment policies and long-established practices that limit adaptability to changing market conditions.

In contrast, Fund Size exhibited a strong positive and significant effect on both ROA and Portfolio Diversification. Larger pension funds benefit from economies of scale, greater investment capacity, and enhanced access to diverse asset classes, enabling them to generate higher returns and maintain more diversified portfolios. These

results highlight the critical importance of structural fund characteristics in shaping financial outcomes and justify their inclusion as control variables in the study. Overall, Fund Age tends to constrain performance and diversification, while Fund Size enhances both, underscoring their combined role in shaping pension fund investment outcomes.

The hypothesis that board size has no effect on financial performance was tested, and the results indicated as follows: The coefficient for board size was  $\beta = 0.1305916$  which was positive and significant, with a p-value of 0.0001, which is well below the 0.05 threshold. This demonstrates a statistically significant positive relationship between board size and the financial performance (measured by ROA) of university pension funds. Therefore, the Null hypothesis was rejected and the alternative accepted. The Z-value was 2.70 which were above +1.96 further supporting that board size enhances financial performance. The findings agree with similar studies Coles, Daniel, and Naveen (2008), Tijjani (2012).

The second hypothesis to be tested was that women size has no significant effect on the financial performance of universities pension funds in Kenya. From the regression results, the coefficient for gender diversity ( $\beta = 0.01224$ ) is positive and significant, with a p-value of 0.025, which is less than the 0.05 threshold. This indicates that the inclusion of women on boards positively impacts financial performance thereby increasing ROA by 0.01224 units for each additional woman on the board. This led to the rejection of Null Hypothesis and the alternative accepted. The Z-value was positive at 2.30 30 further supporting the significant relationship between gender diversity and financial performance, demonstrating that the result is statistically

robust. Past research supporting these findings include Ongore et al. (2015), Kevin et al. (2008), Simpson et al. (2010) and Gyapong et al. (2016).

The hypothesis H<sub>03</sub>: Financial expertise of the board of trustees has no significant effect on the financial performance of Pension Funds of Universities in Kenya was tested, with the following findings: The coefficient for financial expertise  $\beta = 0.1123787$  and a p-value of 0.005 is positive and statistically significant indicating a strong relationship between financial expertise and financial performance. Each unit increase in financial expertise improves ROA by 0.1123787 units. The null hypothesis H<sub>03</sub> is therefore rejected, and the alternative hypothesis is accepted. This confirms that financial expertise within the board of trustees significantly influences the financial performance of university pension funds. This was confirmed by the Z value of 2.79 indicates that the coefficient for financial expertise is 2.79 standard errors away from zero. The findings align with prior studies such as Guner et al. (2008), which found that financially skilled board members influence firms' financial and investment policies. Johl et al. (2015) reported a positive relationship between accounting expertise and financial performance. Andonov et al. (2016) emphasized the role of financial literacy in determining the performance of pension fund boards. The results demonstrate that financial expertise within the board of trustees is critical for enhancing the financial performance of pension funds. Board members with financial knowledge contribute to better governance, informed decision-making and effective investment strategies, ultimately driving improved ROA.

The hypothesis H<sub>04</sub>: Board of trustee size has no significant effect on portfolio diversification of pension funds of universities in Kenya was tested was tested, and the following results were obtained: The coefficient for board size is -0.2879,

indicating a negative relationship between board size and portfolio diversification. As board size increases, diversification decreases. The z-score of -6.89 and a p-value of 0.000 confirm strong statistical significance at the 1% level. Null Hypothesis was therefore rejected and the alternative hypothesis was accepted establishing that board size significantly influences portfolio diversification in university pension funds. The findings are consistent with prior research by Adams & Ferreira (2020) and Kweh et al. (2021) who reported that larger boards could hinder effective decision-making and responsiveness, negatively affecting financial and investment outcomes. Harris & Raviv (2018) highlighted that smaller boards provide stronger oversight and cohesive decision-making, improving portfolio management. The study provides robust evidence that board size significantly impacts portfolio diversification, with smaller boards being more effective in fostering better diversification practices. This highlights the importance of optimizing board size to enhance governance and investment strategies in pension fund management.

The fifth hypothesis  $H_{05}$  stated that Gender diversity has no significant effect on portfolio diversification of pension funds of universities in Kenya. The hypothesis was tested and had the following results: the coefficient was -0.0259 which indicated a very small negative effect on portfolio diversification. The t-statistic is -0.76, and the p-value is 0.042, which is lesser than the 0.05 significance threshold which indicates that the effect of gender diversity on portfolio diversification is not statistically significant. This therefore led to rejecting the null hypothesis ( $H_{05}$ ), indicating that gender diversity of the board of trustees significantly impact portfolio diversification of pension funds. This study corroborates the findings of Manyaga et al. (2020) who found board gender diversity had a negative but significant influence on

return on equity across banks, suggesting that increased female representation might impact financial performance.

Hypothesis H<sub>06</sub> read that Financial Expertise does not have a significant effect on portfolio diversification of universities pension funds in Kenya. The Findings were the  $\beta = 0.0981211$  and a p-value = 0.005 indicating a positive and significant impact of financial expertise on portfolio diversification. For every additional member with financial expertise, portfolio diversification increases by 9.81%. The null hypothesis H<sub>06</sub> was rejected, and the alternative hypothesis is accepted, confirming that financial expertise significantly enhances portfolio diversification. These findings align with research by Andonov and Rauh (2020), Pagliaro & Utkus (2020), and Morales & Stewart (2022), which demonstrate that financial expertise on pension fund boards influences investment allocation and diversification strategies positively. Also Ouma (2019) found that gender diversity significantly and positively affects the financial performance of insurance firms, highlighting the importance of female representation on boards.

H<sub>07</sub> read that portfolio diversification has no significant relationship with financial performance with universities of pension funds in Kenya. When this hypothesis was tested, the following were the findings: the coefficient for the diversification ratio was 0.265, indicating a positive effect on financial performance with a p-value of 0.000, showing statistical significance at the confidence interval for diversification ratio was 0.173 - 0.358 which confirms the robustness of the positive relationship, as it does not include zero. The null hypothesis was rejected, and the alternative hypothesis is accepted stating that portfolio diversification significantly enhances the financial performance of pension funds of universities in Kenya. These results align with

findings from studies like Smith (2022) and Garcia & Xu (2021), which demonstrate that diversification positively impacts firm performance by reducing risk and optimizing returns. Diversified portfolios enable pension funds to balance risk exposure across asset classes, contributing to improved financial outcomes.

Portfolio diversification has a significant positive effect on the financial performance of university pension funds in Kenya. This highlights the importance of diversification strategies in enhancing returns on assets while managing risks effectively.

The test for mediation was done in hypothesis H<sub>08a</sub>, H<sub>08b</sub> and H<sub>08c</sub>. Hypothesis H<sub>08a</sub> read that portfolio diversification does not mediate between board size and financial performance of universities pension funds. This hypothesis was tested and the results and key findings were enumerated as follows: path “a” board size to diversification ratio has coefficient: -0.526, p-value = 0.000 indicating a statistically significant negative relationship, where an increase in board size reduces diversification ratio by 0.526 units. Path “b” diversification ratio to ROA show a coefficient of 0.032, p-value = 0.524 which shows that diversification ratio does not significantly impact ROA. This implies that portfolio diversification does not strongly influence financial performance as measured by ROA. Path c' shows the direct effect of board size → ROA with a coefficient: 0.797, p-value = 0.000 which demonstrates a strong and statistically significant direct relationship between board size and ROA. The insignificant path b indicates no meaningful mediation effect of portfolio diversification as indicated by DivRatio between board size and ROA and the direct relationship between board size and ROA is the dominant effect, supporting the null hypothesis. Based on the Sobel test, the mediation effect was not statistically

significant (z-statistic range:  $-0.636$  to  $0.636$ , within the critical values of  $\pm 1.96$ ). The null hypothesis ( $H_{08a}$ ) is accepted that portfolio diversification does not mediate the relationship between board size and financial performance. The findings are consistent with Coles et al. (2021), who highlighted that larger boards often adopt conservative strategies, limiting diversification. Rumelt (2022) also noted that diversification does not universally enhance firm value and can sometimes detract from performance due to inefficiencies.

Hypothesis  $H_{08b}$  was that Portfolio Diversification does not mediate between board gender diversity (WoSize) and financial performance (ROA) of universities' pension funds in Kenya. The findings of this mediation analysis are represented as follows: Path "a" between Women Size and Diversification Ratio showed a Coefficient of  $-0.266$ ,  $p\text{-value} = 0.000$  which indicated a statistically significant negative relationship, meaning that as the proportion of women on the board increases, the diversification ratio decreases. This suggests gender-diverse boards focus more on core activities than on diversification strategies. Path "b" between Diversification Ratio and ROA showed a Coefficient:  $-0.298$ ,  $p\text{-value} = 0.000$  which indicated a significant negative relationship, implying that higher diversification ratios are associated with lower financial performance (ROA). Diversification appears to detract from financial outcomes in this study. Direct Path c' from Women Size to ROA had a coefficient:  $0.333$  and a  $p\text{-value} = 0.000$  Showing a strong and positive direct effect of gender diversity on financial performance. Increased female representation correlates with better financial performance independent of diversification effects. The significant relationships along Path 'a" and Path "b" indicated the presence of an indirect effect, suggesting partial mediation of portfolio diversification between board gender

diversity and financial performance. The direct effect of gender diversity on ROA (Path c') remains strong, but diversification plays a supporting role in explaining the relationship. The null hypothesis ( $H_{08b}$ ) was therefore rejected and the alternative hypothesis was accepted: Portfolio Diversification mediates between board gender diversity and financial performance. The Sobel Test Statistic ( $Z$ ): 3.213 exceeds the critical threshold of  $\pm 1.96$  at the 5% significance level, the mediation effect is statistically significant. This confirms that diversification significantly mediates the relationship between women's board representation (WoSize) and ROA. The findings align with Adams and Patricia (2012), who noted that gender-diverse boards often favour conservative, less risky strategies and prioritize core operations over diversification. This approach can positively affect firm performance, but diversification's mediating role is also evident. It was concluded that Gender diversity on boards as represented by WoSize directly enhances financial performance (ROA) and partially mediates through diversification, indicating a nuanced influence of female representation on universities pension funds financial performance.

Hypothesis  $H_{08c}$  was that Portfolio Diversification does not mediate between financial expertise (Finexp) and financial performance (ROA) of universities' pension funds in Kenya. The Path "a" from Financial expertise to Diversification Ratio showed a coefficient -0.226,  $p$ -value = 0.001 which indicated a statistically significant negative relationship, meaning that higher financial expertise on the board is associated with reduced diversification. This suggests that financially experienced boards focus on core operations rather than broad diversification, consistent with risk-averse and efficiency-focused strategies noted by Chen and Ho (2021). Path b from Diversification Ratio to ROA showed a coefficient: -0.293,  $p$ -value = 0.000 Indicates

a significant negative relationship, where higher diversification correlates with a decline in ROA. Excessive diversification may dilute focus and deplete resources, consistent with findings by Lee and Li (2020). Direct Path c' Finexp to ROA showed a coefficient of 0.418 with a p-value = 0.000. This showed a strong and positive direct effect of financial expertise on financial performance. Boards with financial higher financial expertise contribute to enhance ROA through prudent management and resource optimization, as supported by Tsui and Lam (2019). The significant relationships along Path "a" and Path "b" indicate the presence of an indirect effect of financial expertise on ROA through portfolio diversification. This partial mediation shows that while financial expertise directly enhances ROA, diversification ratio also plays a mediating role even though negatively. The null hypothesis ( $H_{08c}$ ) was therefore rejected and the alternative hypothesis was accepted that Portfolio Diversification mediates the relationship between financial expertise and financial performance. A Sobel Test was conducted which gave Z of 2.880. Since the Z value exceeded the critical threshold of  $\pm 1.96$  at the 5% significance level, the mediation effect is statistically significant. This confirms that portfolio diversification significantly mediates the relationship between financial expertise and ROA. In conclusion we can say that pension fund boards with financial expertise enhance financial performance directly and through their influence on diversification strategies. However, the negative impact of diversification on ROA highlights the importance of a focused and resource-efficient approach.

## **5.2 Conclusion**

The purpose of the study was to determine the effects of board of trustee characteristics on the financial performance of universities pension funds and whether

portfolio diversification mediates the relationship between board of trustee characteristics and financial performance.

The study concluded that board size has a positive and statistically significant effect on the financial performance of university pension funds, as measured by Return on Assets (ROA). Larger boards contribute to improved performance by harnessing a broader range of diverse knowledge, perspectives, and expertise, which enhance decision-making processes. This diversity allows the board to address complex investment and governance challenges effectively, leading to better financial outcomes. Additionally, larger boards can distribute responsibilities more effectively, fostering strategic oversight and risk management. This finding is consistent with prior research by Coles et al. (2008), who highlighted the benefits of larger boards for complex organizations requiring varied expertise. Similarly, Tijjani (2012) emphasized the positive impact of board size on the sustainability and performance of pension funds, particularly in navigating multifaceted financial environments.

The presence of women on the board was found to have a positive and significant effect on financial performance of Universities pension funds in Kenya, as indicated by a statistically significant coefficient and p-value. This suggests that gender diversity, particularly the inclusion of women, plays a critical role in enhancing financial performance of universities pension funds in Kenya. Women bring unique perspectives to the board, contributing to more balanced and inclusive decision-making processes. Their inclusion fosters participative communication among board members, as highlighted in studies by Ongore et al. (2015) and Simpson et al. (2010). These traits promote greater board independence and effective monitoring, which are vital for improved performance. The study's findings align with prior research that

highlights the value of gender diversity in governance. For instance, Kevin et al. (2008) and Gyapong et al. (2016) emphasize that the presence of women enhances board effectiveness, leading to better firm outcomes. Therefore, the inclusion of women on boards is not only socially desirable but also financially beneficial for pension funds.

The study found a significant positive effect of financial expertise on financial performance, with each unit increase in financial expertise leading to improved ROA. This finding underscores the importance of financial literacy and technical knowledge among board members in driving organizational success. Financial experts contribute to better oversight, investment decision-making, and financial strategy formulation, which are critical for achieving higher returns. The positive effect of financial expertise corroborates findings by Guner et al. (2008) and Johl et al. (2015), which highlight its pivotal role in governance. Furthermore, Andonov et al. (2016) note that financially literate board members are better equipped to manage risks and allocate resources efficiently, resulting in superior outcomes. The findings emphasize the need for pension fund boards to prioritize financial expertise as a core competency among trustees. This would enhance their ability to deliver sustainable financial performance in an increasingly complex investment landscape.

Board size exhibited a negative and significant relationship with portfolio diversification. This finding indicates that as the size of the board increases, the ability to diversify the investment portfolio diminishes. Larger boards often face challenges such as coordination difficulties, slower decision-making, and potential conflicts of interest, which undermine their effectiveness in managing complex investment strategies. These findings align with studies by Adams & Ferreira (2020)

and Harris & Raviv (2018), which advocate for smaller boards to enhance responsiveness and efficiency. Smaller boards are generally more cohesive, allowing for stronger oversight and better management of diversification efforts. The study also aligns with research suggesting that large boards may lean towards conservative and risk-averse strategies, limiting diversification. Therefore, pension funds may benefit from maintaining an optimally sized board to ensure effective portfolio management. A smaller, focused board could lead to better alignment of investment strategies with performance objectives.

The findings indicate that Women Size (proportion of women on the board of trustees) has a significant but negative effect on portfolio diversification, as evidenced by a coefficient of -0.0259, a t-statistic of -2.06, and a p-value of 0.042. Since the p-value is below the 0.05 significance threshold, we reject the null hypothesis ( $H_{05}$ ) that board gender diversity has no significant effect on portfolio diversification. Instead, we accept the alternative hypothesis, confirming that gender diversity significantly influences portfolio diversification. These results contribute to the ongoing debate on the impact of gender diversity in corporate governance. While some studies (e.g., Liu et al., 2014; Carter et al., 2010; Rose, 2007; Abad & Saona, 2022) suggest that gender-balanced boards have positive effects on firm performance, other research (e.g., Jin et al., 2014; Manyaga et al., 2020) has found negative or context-dependent relationships. The current study aligns more closely with the latter, suggesting that increased female representation on boards may lead to a reduction in portfolio diversification. These findings highlight the complexity of gender diversity's role in financial decision-making and portfolio management, emphasizing the need for

further research to explore underlying mechanisms and contextual factors that may influence this relationship.

Financial expertise positively and significantly influenced portfolio diversification. The study found that for every unit increase in financial expertise, there was a corresponding increase in diversification. This highlights the critical role of financial literacy in improving investment strategies and achieving optimal diversification. Board members with financial expertise are better equipped to evaluate complex investment opportunities, assess risks, and make informed decisions. These findings align with research by Andonov & Rauh (2020) and Morales & Stewart (2022), which underscore the importance of financial knowledge in driving effective portfolio management. Pension funds with financially literate boards are more likely to adopt diverse and balanced investment portfolios, reducing risks and enhancing returns. The study underscores the value of recruiting board members with strong financial backgrounds to improve governance outcomes. Such expertise enables pension funds to navigate complex financial markets more effectively.

Portfolio diversification had a positive and significant effect on financial performance. The study revealed that diversification strategies contributed to an enhanced ROA, reflecting their importance in risk management and value creation. Diversified portfolios reduce exposure to unsystematic risks, ensuring more stable returns over time. These findings are consistent with studies by Smith (2022) and Garcia & Xu (2021), which emphasize the role of diversification as a critical driver of firm performance. By spreading investments across different asset classes and sectors, pension funds can mitigate potential losses and capitalize on growth opportunities. This result highlights the need for pension funds to prioritize diversification as a core

strategy for achieving financial sustainability. Effective diversification not only enhances financial performance but also strengthens the resilience of pension funds in volatile markets.

Portfolio diversification did not significantly mediate the relationship between board size and financial performance. The relationship between board size and financial performance was found to be primarily direct, with minimal impact from diversification. This finding suggests that while diversification is a valuable strategy, its mediating role in this context is limited. Larger boards may pursue conservative strategies, focusing more on stability than diversification, as noted by Coles et al. (2021). Additionally, the inefficiencies associated with large boards, such as slower decision-making, may hinder their ability to implement effective diversification. The study highlights the complexity of the relationship between governance structures and financial outcomes. It suggests that while board size directly affects financial performance, other factors may moderate the relationship, requiring further investigation.

This study examines whether diversification ratio (DivRatio) mediates the relationship between board gender diversity (WoSize) and financial performance (ROA). The results indicate partial mediation, as WoSize significantly affects both DivRatio and ROA. Path "a" reveals a negative relationship between WoSize and DivRatio ( $\beta = -0.266$ ,  $p = 0.000$ ), suggesting that gender-diverse boards adopt more risk-averse strategies, prioritizing core business operations over diversification. Path "b" shows that higher diversification negatively impacts ROA ( $\beta = -0.298$ ,  $p = 0.000$ ), implying that diversification, particularly in university pension funds, may dilute focus and reduce profitability. The direct effect (Path c') of WoSize on ROA is

positive and significant ( $\beta = 0.333$ ,  $p = 0.000$ ), highlighting the benefits of board gender diversity in improving financial performance. A Sobel test ( $Z = 3.213$ ) confirms that diversification significantly mediates the relationship, but because *WoSize* still directly influences ROA, the mediation remains partial. These findings align with prior research (e.g., Adams & Ferreira, 2012) and support the argument that excessive diversification can lead to inefficiencies (Lee & Li, 2020). Ultimately, gender-diverse boards enhance operational efficiency and financial performance by limiting diversification and focusing on core business strategies.

Given the significant direct effects of financial expertise on both portfolio diversification and financial performance, it is plausible that diversification plays a partial mediating role. Financial expertise enhances the ability of boards to make informed investment decisions, indirectly improving financial performance through diversification. However, the study suggests that the direct impact of financial expertise on performance is more pronounced than the mediated effect. This aligns with prior research emphasizing the critical role of financial literacy in governance. Diversification serves as an additional pathway through which financial expertise benefits performance, but it is not the primary driver. These findings highlight the multifaceted nature of financial expertise and its contributions to governance outcomes.

### **5.3 Implications of the Study**

#### **5.3.1 Theoretical Implication**

One of the theories that this research was anchored on was the Modern portfolio theory which emphasizes diversification as a strategy to maximize returns while minimizing risk. The findings of this study challenge the universal applicability of

this theory in pension fund management. While portfolio diversification positively impacts financial performance, excessive diversification appears to dilute returns in pension funds. The findings concluded that boards of highly diversified funds should prioritize broad strategies over core operations. Boards with financial expertise tend to favor focused strategies, as reflected in the negative correlation between financial expertise and diversification. This demonstrates a nuanced understanding of risk-return trade-offs, aligning with the theory's core principle that optimal diversification balances exposure to risk without overextending resources. The mediating role of diversification in the relationships between board composition and financial performance highlights the interplay between governance and investment strategy. Gender-diverse boards and those with financial experts have a higher level of influence on diversification decisions, underscoring the interconnectedness of governance structures and portfolio management.

The Agency Theory posits that managers or agents may act in their own interests rather than those of principals (beneficiaries), necessitating strong governance mechanisms to monitor and align the managerial behaviour. This study findings offer important implications for Agency theory. The results from Kenyan university pension funds both support and challenge the assumptions of Agency Theory.

First, the positive effect of board size on financial performance supports the agency view that larger boards strengthen monitoring and reduce opportunistic behaviour. Bigger boards bring more oversight, reduce the likelihood of managerial dominance, and enhance governance checks, which in turn improve performance. This aligns with Agency Theory's argument that increased monitoring reduces agency costs.

Second, the positive and significant influence of gender diversity on performance implies that diverse boards may reduce agency problems. Women are often associated with ethical leadership, caution in financial decisions, and stronger commitment to stakeholder interests. Gender-diverse boards therefore enhance accountability and mitigate managerial self-interest, reinforcing Agency Theory's emphasis on responsible oversight.

Third, financial expertise significantly improves financial performance, offering strong support for Agency Theory. Trustees with technical competence can better scrutinize investment decisions, detect mismanagement, and ensure funds are invested prudently thereby directly reducing agency risks such as poor investment choices or fund misallocation.

The mediation findings also hold implications for Agency Theory. The fact that diversification mediates only some board characteristics suggests that oversight alone is not sufficient; effective governance must be accompanied by informed investment strategy. Gender-diverse and financially expert boards improved performance partly through better investment decisions, indicating that agency problems are mitigated when boards actively shape strategy rather than simply monitor it.

Finally, the negative effect of fund age and the positive effect of fund size highlight structural sources of agency problems. Older funds may accumulate bureaucratic inertia, increasing vulnerability to weak oversight, while larger funds benefit from more robust governance systems. Overall, these findings suggest that strong, diverse, and skilled boards play a critical role in reducing agency costs and improving pension fund performance in line with Agency Theory's predictions.

The Stewardship Theory asserts that managers and board members act as trustworthy stewards who prioritize the long-term interests of beneficiaries through expertise, autonomy, and pro-organizational behaviour. The findings of this study provide significant contributions to theory within the context of university-based pension funds in Kenya. The results of this study reinforce these assumptions while extending the theory to pension fund governance.

First, the positive effects of board size, gender diversity, and financial expertise on financial performance support the Stewardship theory's claim that effective boards enhance organizational outcomes through collective knowledge, diverse perspectives, and sound decision-making. Larger boards improved ROA, indicating that more trustees contribute valuable monitoring capacity and strategic insight. Similarly, gender diversity was associated with better performance, highlighting the value of inclusive governance and aligning with stewardship principles of ethical leadership, relational decision-making and reduced agency conflict. Financial expertise also had a strong positive effect on performance, reinforcing the stewardship view that technically competent trustees make prudent investment decisions, strengthen accountability, and safeguard pension assets for long-term benefit.

The mediation results offer further insight. Portfolio diversification partially mediated the relationship between gender diversity and performance, and between financial expertise and performance, but not between board size and performance. This suggests that stewardship behaviours manifest differently across board attributes. In particular, gender-diverse and financially expert boards tend to pursue more focused, risk-conscious investment strategies rather than broad diversification, adding nuance to traditional assumptions about stewardship-driven investment behaviour.

Finally, the contrasting effects of fund age and fund size extend the theory by illustrating how structural characteristics shape stewardship effectiveness. Larger funds, consistent with stewardship expectations, benefit from stronger governance capacity, while older funds exhibit conservative tendencies that may hinder adaptability.

Overall, the study shows that stewardship-oriented governance anchored in expertise, diversity, and trust significantly enhances pension fund performance, though the mechanisms vary by board characteristic. This contributes new empirical evidence from a developing-country pension context, enriching the understanding of how stewardship principles operate in practice.

### **5.3.2 Policy Implication**

The study provides actionable insights for pension fund boards and policymakers. The study underscores the importance of optimizing board size, incorporating gender diversity, and ensuring financial expertise to improve governance and performance. The findings guide boards in aligning governance practices with investment strategies. Boards with greater financial expertise can prioritize core investment strategies and avoid inefficiencies linked to over-diversification. The Pension fund managers can use these insights to balance diversification and focused strategies, achieving optimal returns while managing risks effectively and especially in universities pension funds.

### **5.3.3 Contribution to knowledge**

The research adds to the existing literature or body of knowledge on pension fund management in several important ways. First, this study provides valuable insights

into the governance dynamics of Kenyan university pension funds, addressing a notable gap in scholarly research focused on pension fund performance in developing countries. While much of the existing literature centers on developed economies, this study brings to light empirical evidence from Kenya, contributing to a more inclusive and context-specific understanding of pension fund governance in sub-Saharan Africa. It highlights the unique structural and regulatory challenges facing university pension schemes in Kenya, thereby enriching global perspectives on pension fund management.

Moreover, the study deepens the understanding of how specific governance variables namely board size, gender diversity, and financial expertise interacts with key financial indicators such as portfolio diversification and fund performance. It sheds light on the crucial interplay between board characteristics and investment strategies, particularly in the context of university-based pension funds. Importantly, by employing mediation analysis, the research establishes the mediating role of portfolio diversification in the relationship between board attributes and financial outcomes. This approach offers a more nuanced and layered perspective, showing that governance features not only directly affect performance but also indirectly shape it through investment behavior, enhancing the strategic governance discourse.

## **5.4 Recommendations**

### **5.4.1 Recommendation to practitioners**

As has been observed in the analysis, board size is a significant contributor to the financial performance of pension funds. Pension fund boards, therefore, should aim to strike a delicate balance between size and functionality to enhance their effectiveness. Larger boards often bring diverse perspectives, improve decision-making processes,

and facilitate thorough deliberation, which can positively impact financial performance. The variety of skills, experiences, and viewpoints available in a larger board can enrich discussions, help identify more comprehensive solutions, and provide broader oversight. For example, when evaluating complex investment opportunities or managing risk in volatile markets, a broader range of insights can lead to more balanced and informed decisions. Furthermore, larger boards may distribute governance responsibilities more effectively, preventing burnout and over-reliance on a few individuals. However, as board size increases, challenges related to coordination, communication, and decision-making efficiency may arise. Members may struggle to reach consensus, discussions may become unwieldy, and it may take longer to make important decisions.

Excessively large boards risk slowing down critical processes, diluting accountability, and fostering groupthink. When too many members are involved, responsibility can become dispersed, making it difficult to identify who is accountable for specific decisions. Furthermore, in an environment where everyone is expected to agree, dominant voices may emerge, marginalizing less assertive but equally valuable contributors. To address these issues, pension fund boards should adopt optimal size parameters tailored to their operational needs, ensuring effective oversight without overburdening governance structures. Determining the optimal board size should involve a comprehensive evaluation of the fund's complexity, size, and strategic priorities. A board that is too small may lack the diversity of thought necessary for effective oversight, while one that is too large may face inefficiencies and governance fatigue. A comprehensive review of the board's structure and its alignment with fund objectives can help achieve this balance, resulting in better governance and improved

financial outcomes. Policymakers and fund sponsors should work together to craft guidelines promoting right-sized boards, ensuring they are reflective of each fund's scale and investment strategy. These parameters should be embedded into governance frameworks to enhance long-term fund sustainability.

This research adds to the past studies that have given credence to the inclusion of women on boards due to the ethical governance benefits and improved financial performance derived from their participation. Women bring unique perspectives to decision-making processes, enhancing discussions and providing innovative solutions to complex issues. Gender diversity in the boardroom is associated with broader dialogue, better consideration of stakeholders' needs, and more balanced risk assessments. This diversity has been shown to foster a culture of ethical accountability, inclusivity, and long-term strategic thinking. The presence of women on boards often correlates with improved transparency, stronger ethical oversight, and a commitment to corporate social responsibility. Many jurisdictions have introduced policies and regulatory interventions to improve gender parity in leadership, recognizing its value in strengthening institutional governance.

This study recommends the government create and implement policies aimed at increasing female representation on pension fund boards. Such efforts should be prioritized as part of broader governance reform. Quotas or voluntary targets may be adopted to ensure meaningful participation of women in governance roles. These mechanisms provide a starting point for inclusion and can be gradually adjusted to support sustainable integration of gender diversity. Beyond increasing representation, boards must ensure that gender diversity aligns with the strategic objectives of the fund. For example, while promoting diversity, it is equally important to ensure that all

members possess or acquire the skills necessary for effective governance. Boards should balance promoting inclusion with focusing on core investment priorities, ensuring that the positive effects of representation translate into tangible, actionable outcomes. Encouraging women's participation in leadership and decision-making roles will not only improve financial performance but also enhance stakeholder confidence in the board's ability to foster equity, inclusivity, and transparency.

Financially skilled board members bring a wealth of knowledge in areas such as risk assessment, portfolio management, and financial planning, all of which are critical to the success of pension funds. Their understanding of financial markets, regulatory frameworks, and investment dynamics enables them to navigate complexity and safeguard fund assets. The study therefore recommends recruiting or training board members with financial expertise as a core strategy for improving governance and aligning investment strategies with industry best practices. Without adequate financial knowledge, boards may struggle to critically evaluate investment proposals, assess performance metrics, or understand the implications of risk exposure. Boards should actively seek individuals with proven expertise in finance, accounting, and investment management when filling trustee positions. These professionals are better equipped to engage in technical discussions, challenge assumptions, and contribute to data-driven decision-making.

Additionally, continuous professional development programs should be introduced to enhance the skills of existing members and enable them to stay abreast of the evolving financial landscape. The dynamic nature of global financial markets demands that board members remain current with emerging trends, regulatory updates, and innovative investment vehicles. Training should be structured and recurring, with

modules tailored to pension fund governance. Pension funds should consider forming partnerships with educational institutions, regulatory bodies, and professional associations to deliver relevant, high-quality training programs. Such collaborations can also help standardize learning outcomes and support the creation of certification pathways that validate board members' competencies. Strong financial expertise within the board enhances decision-making processes, strengthens oversight of fund management, and ensures effective responses to market changes. This fosters a culture of accountability, strategic clarity, and prudent financial stewardship.

Diversification is a fundamental principle of investment, helping to mitigate risk by spreading investments across different asset classes, sectors, and geographies. It is a widely accepted strategy for protecting fund assets from market volatility and economic downturns. However, the study reveals that over-diversification may dilute returns, particularly when resources are spread too thin or when the focus on core, high-performing investments is diminished. Excessive diversification can lead to complexity, higher transaction costs, and difficulty in tracking performance across multiple investments. Pension funds should adopt a strategic approach to diversification, ensuring that it aligns with the fund's risk tolerance, return expectations, and performance objectives. Board members must critically evaluate the benefits and limitations of diversification strategies, opting for tailored solutions that maximize risk-adjusted returns.

Enhanced monitoring tools and performance metrics should be used to track the effectiveness of diversification strategies and make data-driven adjustments as needed. Regular portfolio reviews, stress testing, and scenario analysis should be integrated into the governance framework to assess the impact of market changes on

investment outcomes. Clear diversification policies, supported by robust governance structures, can enable boards to optimize their investment portfolios and achieve sustainable growth. These policies should be documented and reviewed periodically to adapt to changes in fund demographics, regulatory requirements, and market conditions. Boards with financial expertise are particularly well positioned to identify and prioritize core investments, ensuring efficient resource allocation and enhanced portfolio performance.

Core investments typically represent stable, high-performing assets that align with long-term fund objectives. These may include government bonds, blue-chip equities, and high-quality real estate assets. By concentrating on these investments, boards can reduce exposure to unnecessary risks associated with speculative ventures, while reinforcing a focus on prudence, sustainability, and long-term value creation. A disciplined approach to portfolio construction that emphasizes core holdings contributes to predictable cash flows and capital preservation, which are critical for meeting future pension obligations. Leveraging financial expertise to enhance due diligence and risk analysis will ensure that resources are directed toward opportunities with the greatest potential for growth and stability. This not only optimizes returns but also strengthens fund resilience in volatile market conditions, ultimately securing the retirement benefits of members and enhancing trust in the pension system.

#### **5.4.2 Policy Recommendations**

The Retirement Benefits Authority (RBA), as the principal regulator of pension funds in Kenya, plays a pivotal role in ensuring that governance standards are consistently upheld across the industry. These standards are critical for promoting efficiency, transparency, and accountability in pension fund operations. To strengthen

governance practices, the RBA can establish minimum requirements for board composition. For example, it can mandate a minimum number of trustee board members with financial expertise to ensure that investment decisions are guided by individuals with adequate technical knowledge. Similarly, the regulator can enforce minimum thresholds for gender representation on boards to promote gender diversity. This would ensure that pension fund boards benefit from diverse perspectives, reduce groupthink, and enhance overall decision-making processes. Additionally, policies should address crucial governance elements such as optimal board size, board independence, and the identification and management of potential conflicts of interest, which are all vital to fostering integrity and effective oversight.

To reinforce these governance standards, regulators may also consider introducing mandatory certification programs for board members. Such programs would verify their competencies in financial management and governance, providing assurance that trustees are well-equipped to oversee pension fund operations responsibly. Furthermore, the RBA should mandate regular audits and board performance evaluations. These assessments would serve as important checks to ensure ongoing compliance with governance requirements and provide opportunities for continuous improvement. Collectively, these measures are likely to enhance public trust in the pension system, safeguard members' benefits, and mitigate the risk of governance failures that could lead to financial mismanagement or underperformance of pension funds.

In addition to setting governance standards, the Retirement Benefits Authority and other government institutions have a responsibility to invest in capacity-building initiatives aimed at strengthening the competencies of pension fund boards. This

involves developing and implementing training programs that focus on financial literacy, investment management, and risk assessment. By equipping board members with these essential skills, they will be better positioned to make informed decisions that are aligned with the fund's objectives and long-term sustainability. Collaborations with academic institutions and industry experts can also be leveraged to design high-quality training content that reflects emerging trends and current challenges in pension fund governance. These collaborations will ensure that board members are not only trained in foundational concepts but are also exposed to innovative practices and global best standards.

Boards should also be encouraged to regularly participate in workshops, conferences, and professional certification courses. These platforms serve as valuable opportunities for learning, networking, and the exchange of knowledge. Continuous professional development initiatives will foster a culture of learning and innovation within pension governance structures. This, in turn, will enhance the quality of decision-making and contribute to improved fund performance and sustainability.

Ultimately, the implementation of these recommendations will significantly strengthen the governance frameworks, investment strategies, and regulatory oversight of pension funds. By placing emphasis on board composition, strategic capacity-building efforts, and robust regulatory measures, the pension industry in Kenya can achieve long-term growth, improved financial performance, and increased stakeholder confidence. These reforms will not only benefit individual pension schemes but will also contribute to the overall stability, resilience, and integrity of the national pension system.

### **5.4.3 Limitations of the study**

This study concentrated on three key board characteristics namely board size, women size and financial expertise alongside, portfolio diversification as the mediator to examine their impact on financial performance as measured by Return on Assets (ROA). However, this research did not address other potentially influential aspects of board structure, such as the age, educational background of board members, the tenure of trustees, ex-officials or other board dynamics that may affect financial outcomes. These omissions highlight the need for future research to explore a more comprehensive range of board attributes. Additionally, the study's focus on ROA as the sole measure of financial performance may limit the generalizability of its findings. Expanding the scope to include other performance metrics could provide a more holistic understanding of the topic.

### **5.4.4 Recommendations for future research**

The current study specifically concentrated on several key board characteristics: board size, gender diversity, and financial expertise. It investigated how these characteristics influence both the financial performance and portfolio diversification of university pension funds in Kenya. While these variables are essential and widely recognized in governance literature, future studies should broaden the scope by incorporating additional board attributes. Characteristics such as educational background, board tenure, and the age of board members could provide a more comprehensive understanding of the dynamics at play. For instance, educational qualifications may reflect the analytical capacity and decision-making skills of board members, while tenure and age could impact boardroom experience, adaptability to change, and openness to innovative investment strategies. Exploring these aspects may reveal

perceived effects on both financial performance and the diversification of investment portfolios.

Moreover, future research could benefit from examining the interpersonal dynamics within boards, including decision-making styles, group cohesion, and the influence of dominant or charismatic individuals. These behavioral dimensions often shape the effectiveness of governance beyond what structural attributes alone can explain. The ability to understand how board members interact, negotiate, and reach consensus or fail to agree can offer deeper insights into the operational realities of governance and the quality of oversight provided. In addition, expanding the research context to include pension funds from other sectors such as corporate, public service, and industry-specific funds like agriculture, energy as well as from different geographical regions, could yield valuable comparative insights. Such comparisons would help identify contextual variables, such as regulatory environments, cultural influences, or economic conditions, which moderate the relationship between board characteristics and fund performance.

Another promising avenue for future research lies in longitudinal studies that assess how changes in board composition over time affect pension fund outcomes. This would help determine whether the impact of board characteristics is immediate or evolves as board dynamics shift.

Qualitative research methods, such as case studies and in-depth interviews with board members and fund managers, could also provide a richer, more nuanced understanding of the mechanisms linking board features to governance outcomes.

Such methods would uncover practical challenges in implementing governance best practices and aligning investment strategies with long-term objectives.

Lastly, future research should consider the evolving regulatory landscape and emerging investment trends, incorporating the latest guidelines from oversight bodies. By addressing these areas, future studies can significantly enhance our understanding of effective governance and contribute to more sustainable and resilient pension fund management

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## APPENDICES

**Appendix 1: List of registered Public Universities Pension Funds and their relative ages**

No.	Name	Year of registration	Age as at 1 <sup>st</sup> January 2015
1	University of Nairobi	2007	8
2	Moi University Pension Scheme	1991	24
3	Kenyatta University Pension Scheme	1994	21
4	Egerton University Pension Scheme	1967	48
5	Jomo Kenyatta University of Agriculture and Technology	2002	13
6	Maseno University Pension Scheme	1990	25
7	Dedan Kimathi University	2007	8
8	Masinde Muliro University Pension Scheme	2003	12
9	Technical University of Kenya Pension	2013	2
10	Masai Mara University	2014	1
11	Multi Media University	2013	2
12	South Eastern Kenya University	2012	3
13	Jaramogi Oginga Odinga University	2011	4
14	University of Kabianga	2013	2
15	Kibabii University	2014	1
16	Machakos University	2013	2
17	Murang'a University of Technology	2014	1
18	Cooperative University of Kenya	2006	9
19	Utalii College	1975	40
20	USIU Pension Scheme	1997	8
21	Strathmore University P.S	1990	25
22	Daystar University P.S	1996	19
23	Africa Nazarene University P.S	1998	17
24	Kenya Methodist University P.S	2012	3
25	The Catholic University P.S	2005	10
26	Daystar University P.S	1996	19
27	St Paul's University P.S	2003	12

**Source: Researcher 2025**

## Appendix 2: Pension fund Board of trustee Characteristics

Name of Pension Scheme .....YEAR .....

	No. of Fund board of trustee members	No. of female board of trustee members	No. of board of trustee members with accounting professional knowledge	Average age of board of trustee members
2015				
2016				
2017				
2018				
2019				
2020				
2021				
2022				

**Source: Researcher (2025)**

### Appendix 3: Pension Fund Size and Financial Performance

Name of Pension Scheme .....

	<b>Income (Ksh.)</b>	<b>Assets (Ksh.)</b>	<b>ROA</b>	
2015				
2016				
2017				
2018				
2019				
2020				
2021				
2022				

**Source: Researcher (2025)**

#### Appendix 4: Investments by Universities Sponsored Pension Schemes

Signature.....Date.....

Name of university pension Scheme -----

Investment Category	Investment in Million Shs							
	2015	2016	2017	2018	2019	2020	2021	2022
Government Securities								
Quoted Equities								
Immovable Property								
Guaranteed Funds								
Listed Corporate Bonds								
Fixed Deposits								
Offshore								
Cash								
Unquoted Equities								
Private Equity								
Real Estate Inv. Trust								
Commercial paper, non-listed bonds by private companies								
Immovable Property								
Other Assets								

Source: Researcher (2025)

### Appendix 5: Descriptive statistics

---

Statistics	N	Min	Max	Mean	SD
FundAge	208	1	55	17.53846	12.07939
FundSize	208	13.9M	17.4B	2.42B	3.78B
BDSIZE	208	4	14	7.485577	1.203772
WoSize	208	1	5	2.240385	0.8223355
FinExp	208	1	7	2.913462	1.134531
DivRatio	208	-0.00678	0.3216267	0.059853	0.0288133
ROA	208	-0.00678	0.2147688	0.08801	0.0223291

---

M = Million B = Billion

**Source: Research 2025**

### Appendix 6: Descriptive Statistics over the Years

---

YEAR	FundAge	FundSize	BDSIZE	WoSize	FinExp	DivRatio	ROA
2015 M	14.03846	1.69B	7.653846	2.153846	3.384615	0.585536	.0809651
SD	12.06476	3.07B	1.056118	0.9671528	1.444352	.0596967	.0354352
2016 M	15.03846	2.15B	7.692308	2.269231	3.115385	.0591427	.0844576
SD	12.06476	3.57B	1.59422	.8744229	1.505375	.021646	.018861
2017 M	16.03846	2.27B	7.615385	2.230769	2.923077	.0557745	.0827445
SD	12.06476	3.86B	1.09825	.7646015	1.163549	.0276599	.017745
2018 M	17.03846	2.37B	7.576923	2.192308	2.769231	.0497852	.0782088
SD	12.06476	3.80B	.9868364	.5670436	.862911	.0166203	.0119697
2019 M	18.03846	2.47B	7.269231	2.269231	2.730769	.0563385	.081323
SD	12.06476	3.80B	1.150919	.7775702	.9190296	.0220897	.0133546
2020 M	19.03846	2.67B	7.192308	2.346154	2.730769	.0629007	.0946006
SD	12.06476	4.05B	1.233507	.8918434	.9190296	.0149151	.0175219
2021 M	20.03846	2.92B	7.500	2.192308	2.884615	.0599208	.0930351
SD	12.06476	4.30B	1.30384	.8952868	1.032547	.0192298	.0127131
2022 M	21.03846	2.85B	7.384615	2.269231	2.769231	.0764046	.1087477
SD	12.06476	4.02B	1.168826	.8744229	1.031802	.016968	.0255562
Total M	17.53846	2.42B	7.485577	2.240385	2.913462	.0598526	.0880103
SD	12.07939	3.78B	1.203772	.8223355	1.134531	.0288133	.0223291

---

M = Mean, SD = Standard Deviation B= Billion

Source: Researcher 2025

**Appendix 7: Descriptive Statistics Sector-wise**

SECTOR	FundAge	FundSize	BDSIZE	WoSize	FinExp	DivRatio	ROA
PRIVATE	19.625	0.718B	6.92188	1.95313	2.89063	0.0631	0.08657
PUBLIC	14.88889	3.16B	7.73611	2.31944	2.91667	0.05836	0.0886
Total	16.34615	2.41B	7.48558	2.20673	2.90865	0.05982	0.08798

**Appendix 8: Unit Root Test Results**

Variable	Statistic	P-Value
FundSize	-3.8098	0.0001
Fund Age	-3.5001	0.0002
BDSIZE	-4.1952	0.0000
WoSize	-3.7382	0.0001
FinEXp	-4.7043	0.0000
DivRatio	-2.7535	0.0029
ROA	-4.0934	0.0000

### Appendix 9: Correlation Analysis Results

ROA	FundSize	FundAge	BDSIZE	WoSize	FinExp	DivRatio	
ROA	1.0000						
FundSize	0.8760*	1.0000					
	0.0000						
FundAge	-0.5161*	-0.6892*	1.0000				
	0.0000	0.0000					
BDSIZE	0.7800*	0.7889*	-0.3662*	1.0000			
	0.0000	0.0000	0.0000				
WoSize	0.4121*	0.3640*	-0.2314*	0.4412*	1.0000		
	0.0000	0.0000	0.0008	0.0000			
FinExp	0.4837*	0.4302*	-0.3096*	0.3167*	0.2930*	1.0000	
	0.0000	.0000	0.0000	0.0000	0.0000		
DivRatio	-0.3869*	-0.4849*	0.0771	-0.5261*	-0.2661*	-0.2260*	1.0000
	0.0000	0.0000	0.2680	0.0000	0.0001	0.0010	

\* Sig = significant at 0.05

*FundSize = Fund size, FundAge = Fund age, BDSIZE = Board size, WoSize = Women size, FinExp = Financial expertise, DivRatio = Diversification ratio*

**Source: Researcher 2025**

**Appendix 10: Normality Test Results**

<b>Variable</b>	<b>Obs</b>	<b>W</b>	<b>V</b>	<b>z</b>	<b>Prob&gt;z</b>
ROA	208	0.99206	1.226	0.471	0.31898
Fund Size	208	0.99313	1.060	0.134	0.44654
Fund Age	208	0.99499	0.773	-0.594	0.72371
Board Size	208	0.99258	1.145	0.313	0.37724
Women Size	208	0.99038	1.485	0.911	0.18109
FinExpt	208	0.99451	0.847	-0.383	0.64922
DivRatio	208	0.99387	0.946	-0.127	0.55061

*FinExpt = Financial expertise, DivRatio = Diversification Ratio*

**Source: researcher 2024**

**Appendix 11: Multi-collinearity Test Results**

<b>Variable</b>	<b>VIF</b>	<b>1/VIF</b>
Fund Size	6.32	0.158146
Fund Age	2.67	0.374998
Board Size	3.48	0.287596
Women Size	1.30	0.772029
Financial Expertise	1.28	0.783374
Diversification Ratio	1.72	0.580714
Mean VIF	2.79	

**Source: Researcher 2024**

**Appendix 12: Breusch-Pagan / Cook-Weisberg test for Homoscedasticity**

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Ho: Constant variance  
Variables: fitted values of ROA

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chi2 (1) = 0.71

Prob > chi2 = 0.3991

---

**Appendix 13: Auto-correlation Test Results**

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F-Statistic	0.374
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P-value	0.6502
---------	--------

Degrees of freedom	(1, 7)
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### Appendix 15: Fixed effect Results

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Fixed-effects (within) regression	Number of obs =	208
Group variable: YEAR	Number of groups =	8
R-sq: within = 0.7740	Obs per group: min =	26
Between = 0.9454	avg =	26.0
Overall = 0.7871	max =	26
F(6,194) = 110.76		
corr(u <sub>i</sub> , Xb) = 0.2470	Prob > F =	0.0000

---



---

ROA	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]
FundAge	0.0043896	.0005961	7.36	0.000	.0032139 .0055653
FundSize	99.27798	11.31571	8.77	0.000	76.96038 121.5956
BDSIZE	0.0220358	0.0070757	3.11	0.002	.0080806 .035991
WoSize	0.0006557	0.0002877	2.28	0.024	.0000883 .0012232
FinExp	0.0942072	.0342485	2.75	0.007	.0266601 .1617544
DivRatio	0.0281099	.0165491	1.70	0.091	-.0045293 .0607492
_cons	0.8533593	.0124919	68.31	0.000	.828722 .8779967

---

—  
sigma\_u .0205208

sigma\_e .0559378

Rho .11861599 (fraction of variance due to u<sub>i</sub>)

F test that all u<sub>i</sub>=0: F(7, 194) = 3.05 Prob > F = 0.0046

**Appendix 16: Regression for Direct effects**

xtreg ROA FundAge FundSize BDSize WoSize FinExp DivRatio, re

Random-effects GLS regression                      Number of obs    =    208  
 Group variable: YEAR                                Number of groups =    8  
 R-sq.: within = 0.7726                              Obs per group: min = 26  
 Between = 0.9534                                    avg = 26.0  
 Overall = 0.7889                                    max =        26  
 Wald chi2 (6)        =    751.05  
 corr(u\_i, X) = 0 (assumed)                      Prob > chi2        = 0.0000

ROA	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]
FundAge	0.0051608	0.000579	8.91	0.000	0.004026 0.0062957
FundSize	114.9791	10.8969	10.55	0.000	93.62156 136.3366
BDSize	0.0192945	0.0071474	2.70	0.007	0.0052859 0.033303
WoSize	0.0006797	0.0002958	2.30	0.022	0.0001 0.0012595
FinExp	0.0981211	0.0351541	2.79	0.005	0.0292203 .1670218
DivRatio	0.0358929	0.0169773	2.11	0.035	0.0026181 0.0691677
_cons	0.8376808	0.0123881	67.62	0.000	0.8134005 0.8619611

\_\_\_\_\_  
 sigma\_u        0  
 sigma\_e    .05592313  
 rho            0 (fraction of variance due to u\_i)

### Appendix 17: Test of Hypothesis H08a results

---

Standardized	Coef	Std. Err.	z	P>z	[95% Conf. Interval]	
Structural						
DivRatio <-						
BDSIZE	-.5261352	.0465443	-11.30	0.000	-.6173603	-.4349101
_cons	-4.092529	.5605291	-7.30	0.000	-5.191146	-2.993913
-----+-----						
ROA <-						
DivRatio	.0324635	.0509772	0.64	0.524	-.06745	.1323769
BDSIZE	.7970489	.0342464	23.27	0.000	.7299272	.8641706
_cons	3.332868	.4691569	7.10	0.000	2.413338	4.252399
var(e.DivRatio)	.7231818	.0489772			.6332865	.8258377
var(e.ROA)	.3908867	.0352994			.3274782	.4665728

---

LR test of model vs. saturated:  $\chi^2(0) = 0.00$ , Prob >  $\chi^2 =$

### Appendix 18: Test of Hypothesis H08b results

Standardized Structural	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
DivRatio <-						
WoSize	-.2661196	.0632761	-4.21	0.000	-.3901385	-.1421007
_cons	-6.985039	.4557651	-15.33	0.000	-7.878322	-6.091756
-----+-----						
ROA <-						
DivRatio	-.2983609	.059913	-4.98	0.000	-.4157882	-.1809337
WoSize	.3326739	.0577104	5.76	0.000	.2195636	.4457842
_cons	5.352668	.6451874	8.30	0.000	4.088124	6.617212
var(e.DivRatio)	.9291803	.033678			.8654626	.9975891
var(e.ROA)	.7474804	.0505802			.6546378	.8534902
LR test of model vs. saturated: chi2(0) = 0.00, Prob > chi2 =						

### Appendix 19: Test of Hypothesis H08c results

Standardized	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
<b>Structural</b>						
<b>DivRatio &lt;-</b>						
FinExp	-.2259664	.0649518	-3.48	0.001	-.3532695	-.0986633
_cons	-6.99443	.4727285	-14.80	0.000	-7.920961	-6.067899
-----+-----						
<b>ROA &lt;-</b>						
DivRatio	-.2925295	.0570007	-5.13	0.000	-.4042488	-.1808101
FinExp	.4175954	.0521302	8.01	0.000	.315422	.5197687
_cons	4.950738	.6220714	7.96	0.000	3.7315	6.169975
var(e.DivRatio)	.9489392	.0293538			.8931161	1.008251
var(e.ROA)	.684833	.0509479			.5919156	.7923363
LR test of model vs. saturated: chi2 (0) = 0.00, Prob > chi2 =						

## Appendix 20: Research Authorization



**MOI UNIVERSITY  
POSTGRADUATE OFFICE  
SCHOOL OF BUSINESS AND ECONOMICS**

Tel: 0790940508  
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P.O. Box 3900  
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Kenya

**RE: MU/SBE/PGR/ACD/21B**

**DATE: 24<sup>th</sup> April, 2022**

**TO WHOM IT MAY CONCERN:**

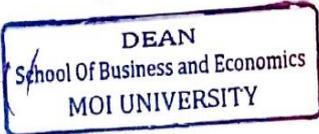
**RE: NJUGUNA DAVID MAINA - SBE/DPHIL/BM/17/15**

The above named is a bonafide student of Moi University, School of Business & Economics, undertaking **Doctor of Philosophy in Business Management** degree; specializing in **Finance**.

He has successfully completed coursework, defended his proposal, and is proceeding to the field to collect data for his research titled: "*Trustee Board Characteristics, Portfolio Diversification and Financial Performance of University Pension*"

Any assistance accorded to him will be highly appreciated.

Yours faithfully,

**DR. RONALD BONUKE**  
**ASSOCIATE DEAN AND CHAIR-POSTGRADUATE STUDIES**

/pn

### Appendix 21: Research Permit

  
**REPUBLIC OF KENYA**

  
**NATIONAL COMMISSION FOR  
SCIENCE, TECHNOLOGY & INNOVATION**

Ref No: **926091** Date of Issue: **12/May/2022**

**RESEARCH LICENSE**



**This is to Certify that Mr. DAVID MAINA NJUGUNA of Moi University, has been licensed to conduct research in Nairobi on the topic: TRUSTEE BOARD CHARACTERISTICS, PORTFOLIO DIVERSIFICATION AND FINANCIAL PERFORMANCE OF UNIVERSITIES PENSION FUNDS IN KENYA for the period ending : 12/May/2023.**

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**Appendix 22: Plagiarism Report**

SR879

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In recognition for passing the University's plagiarism

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**Word count:55073**

Awarded by

Prof. Anne Syomwene Kisilu  
CERM-ESA Project Leader    Date: 17/06/2025