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Board of Trustee Characteristics, Portfolio Diversification, and Financial Performance of University Pension Funds in Developing Economies

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ABSTRACT

In Kenya, university pension funds have underperformed due to irregular investment returns, non-remittance of contributions, and fund insolvencies. The purpose of this study was to examine the mediating role of portfolio diversification on the relationship between pension fund board characteristics and financial performance in Kenyan universities' pension funds. The study focused on board size, gender diversity, and financial expertise and their impact on financial performance through the mediator of portfolio diversification. Using an explanatory design, the study analyzed secondary data from 26 universities' pension funds covering the period 2015–2022 with 208 observations. The theories underpinning the research were Modern Portfolio Theory, Agency Theory and the Resource Dependence Theory. Results showed that board size has a positive influence on financial Performance ($\beta = 0.1306$, $p < 0.05$) but a negative effect on portfolio diversification ($\beta = -0.2879$, $p < 0.05$). Gender diversity enhances financial performance ($\beta = 0.0122$, $p < 0.05$) but negatively impacts diversification ($\beta = -0.0259$, $p < 0.05$), Financial expertise improves both ROA ($\beta = 0.1124$, $p < 0.05$) and diversification ($\beta = 0.0981$, $p < 0.05$). Sobel test results showed that portfolio diversification does not mediate board size and financial performance ($Z = -0.636$) but mediates gender diversity and financial expertise with financial performance ($Z = 3.213$ and 2.880 , exceeding ± 1.96). Policymakers should promote diverse boards with financial expertise to enhance decision-making. Regulators should mandate financial expertise and gender thresholds to improve investment strategies and diversification.

INTRODUCTION

Financial performance assesses a firm's policies and operations in monetary terms. For pension funds, it directly affects competitiveness and members' retirement benefits. Naz *et al.* (2016) highlight financial performance as a measure of financial health and resource efficiency. Public universities in Kenya receive government capitation and negotiated employer-employee contributions, while private universities rely on student fees. Employees contribute 7.5%–10% of their basic salaries, with employers contributing 15%–20%, linking pension savings to salary increments.

Pension funds may be funded or unfunded. Funded schemes accumulate contributions over time, while unfunded schemes operate on a pay-as-you-go basis. Kenyan public university pension funds are funded, but non-remittance of contributions by employers has posed challenges. A 2018 audit revealed a USD 48 million shortfall in pension remittances by 26 universities as of June 2017 (University World News, 2019). Globally, mechanisms like cash transfers and public works programs protect retirees. In Kenya, schemes including the NSSF, PSSS, and occupational retirement schemes, contribute 23% of the GDP (International Organisation of Pension Supervisors [IOPS], 2018). Trustees manage pension funds, balancing returns and risk. Board size, gender inclusivity, and financial expertise significantly influence fund performance. Financial expertise improves

investment strategies (Chohan, 2018; Guner *et al.*, 2008), while Malaysian studies link accounting skills to better outcomes (Johl *et al.*, 2015). Kenyan regulations, including the Retirement Benefits Authority Act and the 2015 Investment Policy Statement, mandate diversification to enhance performance and reduce risk (Mungai & Elly, 2017; Lizares, 2019).

Pension assets in Kenya have grown from under USD 1 billion in 2000 to USD 13.24 billion by December 2019 (Mutuku, 2020). However, the GDP ratio of pension assets remains low at 12.9% (Organisation for Economic Co-operation and Development [OECD], 2019), signaling weak performance amid an aging population. Trustees predominantly invest in traditional asset classes such as government securities, quoted equities, guaranteed funds, and limited property holdings (Mutuku, 2020). Tari (2014) noted that many pension schemes allocate a significant share to treasury bonds and bills without clear investment targets. Returns on segregated schemes declined from 18.4% in 2017 to 5.2% in 2018 (Cyttonn, 2019). Mismanagement of funds is evident, as trustees continue to invest in unstable banks, such as the collapsed Imperial Bank, leading to losses of pension contributions (Odundo, 2017). Research also indicates that some pension funds fail to meet payment obligations or provide returns below market expectations (Genesis Kenya, 2013; Njeru *et al.*, 2015; Rono *et al.*, 2010). Government pension expenditure has surged,

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reaching Ksh 86 billion in 2019 and projected to hit Ksh 104 billion in 2020/2021 (Business Daily, 2019). Additionally, retirees lost over Ksh 35 billion due to stock price declines (East African, 2020). Many retirees have struggled with delayed payments, unremitted employer contributions, and inadequate savings to sustain them post-retirement (Muriithi & Wamari, 2013; Wepukhulu *et al.*, 2018). This has led to declining employee retention in universities (Mathula, 2018). While extensive research exists on pension fund performance, studies on Kenyan universities' pension funds have remained scarce. Furthermore, although diversification and board characteristics are well-studied in corporate finance, their interaction in university pension funds has been underexplored. This study investigated whether portfolio diversification mediates the relationship between board characteristics and the financial performance of Kenyan university pension funds.

Research Hypothesis

H01: Portfolio Diversification does not mediate the relationship between board size and financial performance of pension funds of universities in Kenya

H02: Portfolio Diversification does not mediate the relationship between board gender diversity and financial performance of pension funds of universities in Kenya

H03: Portfolio Diversification does not mediate the relationship between financial expertise and financial performance of pension funds of universities in Kenya

LITERATURE REVIEW

Theoretical Review

Modern Portfolio Theory

Modern Portfolio Theory (MPT), developed by Harry Markowitz in 1952, is a foundational framework for making investment decisions. The theory is built on two main principles: maximizing returns for a given level of risk and reducing risk through diversification of unrelated assets. Markowitz emphasized that risk is an inherent component of higher rewards and advocated for prudent investors to diversify their portfolios to achieve better risk-adjusted returns. Casault *et al.* (2013) highlighted that MPT focuses on how assets interact within a portfolio rather than their individual merits, analyzing their relationship to market fluctuations to optimize portfolio composition. Mutula and Kagiri (2018) confirmed that diversification reduces portfolio risk compared to holding a single stock. Their research also established significant links between diversification decisions, managerial competency, investment strategies, regulatory compliance, and pension fund performance in Kenya. Bodie (2005) argued that incorporating alternative asset classes like stocks, bonds, and real estate enhances the risk-reward profile of portfolios, supporting MPT's focus on diversification. For instance, Kimeu (2015) found that investments in bonds, equity, and real estate positively influence the financial performance of companies listed on the Nairobi Securities Exchange, validating the practical relevance of the theory.

Legal frameworks in various jurisdictions underscore the importance of diversification. For example, Zambia mandates pension funds to allocate between 5% and 70% of their investments in equities, while Kenya sets limits for private equity, corporate bonds, and fixed deposits. Paula *et al.* (2016) noted that pension schemes globally are often legally required to diversify, ensuring higher returns with lower risk. Adejoh (2013) emphasized that managing risk in investment portfolios significantly impacts pension fund performance, recommending investments in less risky assets. In Kenya, the Retirement Benefits Authority (RBA) provides clear guidelines for investment managers, further reinforcing the importance of diversification in managing pension funds effectively.

Agency Theory

Agency theory, as defined by Jensen and Meckling (1976), describes the principal-agent relationship as a contractual agreement in which principals, such as shareholders or fund members, delegate decision-making authority to agents, such as managers or trustees. This delegation can lead to conflicts of interest since agents may prioritize their personal interests over those of the principals. To address these conflicts, agency theory emphasizes mechanisms like monitoring systems and incentives to align agents' actions with the objectives of the principals (Davis & Bryant, 2012; Claessens & Yurtoglu, 2013). The delegation of authority creates agency costs, which Jensen and Meckling (1976) divide into three categories. Monitoring expenditures are incurred by principals to oversee agents and ensure accountability. Bonding expenditures include incentives such as salaries and bonuses to align agents' interests with those of the principals. Residual loss represents the costs resulting from suboptimal decisions by agents that fail to maximize corporate value. Without effective oversight, agents may misuse resources, such as pursuing unnecessary expansion or engaging in risky investments that offer limited benefits relative to the risks (Hart & Moore, 1990; Jensen, 1988; Shleifer & Vishny, 1989). In the context of pension fund governance, fund members act as principals who rely on trustees, their agents, to manage day-to-day operations and achieve the ultimate goal of maximizing returns. Trustees must prioritize the best interests of contributors by reducing costs and making sound investment decisions. A diverse pension board is particularly valuable as it brings varied perspectives that can enhance decision-making and correct informational biases, leading to better outcomes for fund members (Westphal *et al.*, 2000). Corporate governance plays a critical role in mitigating agency problems. Effective governance mechanisms, tailored to the firm's environment, can help reduce agency costs and align managerial decisions with organizational objectives (McColgan, 2001; Okeahalam & Akinboade, 2003). For pension funds, this translates into ensuring trustees act responsibly to optimize returns while minimizing costs, thereby safeguarding the financial interests of the contributors they represent.

Resource Dependence Theory (RDT)

Resource Dependence Theory was articulated by Pfeffer and Salancik (1978) in their work titled *The External Control of Organizations*, which presents organizations as open systems reliant on external environmental contingencies. Managers, empowered by shareholders, are tasked with navigating through uncertainties by leveraging their control over external resources (Ulrich & Barney, 1984). Directors play a critical role in securing resources like finance, information, skills, and networks, which are essential for organizational success (Hillman *et al.*, 2000; Rodriguez *et al.*, 2002). RDT is particularly insightful in studying corporate boards. Pfeffer (1972) noted that boards help firms minimize dependency and access essential resources. Empirical evidence, as highlighted by Hillman *et al.* (2009), suggested that RDT is more effective than agency theory for understanding board dynamics. Directors are expected to contribute specialized expertise, reducing costs associated with outsourcing these capabilities (Abdulla & Valentine, 2009). Nguyen *et al.* (2012) emphasized that increasing board size and diversity enhances access to critical resources, prestige, and legitimacy in external environments. Executive succession is another critical aspect of RDT. Pfeffer and Salancik (1978) argue that managing succession is a key strategy for addressing environmental uncertainties. Boards provide four main benefits: access to resources and expertise, communication channels with key stakeholders, support from influential organizations, and enhanced legitimacy. Carter *et al.* (2003) highlighted that diverse boards strengthen independence, improving oversight of managers. Similarly, Bryant and Davis (2012) suggest that diversity on boards improves access to information and networks, enhancing the organization's ability to navigate uncertainties and secure a competitive advantage. Organizations with diverse and resourceful boards are better equipped to control scarce resources and minimize uncertainty for stakeholders, thereby achieving their strategic goals.

Empirical Review

The global elderly population is rising, increasing poverty risks among households with individuals over 60 (Kwakwani & Subbarao, 2005). Improved life expectancy, driven by advances in healthcare, living standards, and education, has fueled this trend. In Kenya, life expectancy grew from 40 years in 1963 to 67.47 years by 2020 (Worldometer, 2020). This demographic shift elevates financial and social costs, emphasizing the need for effective policies to support retirees. Financial performance is a vital measure of an organization's health and resource efficiency (Isa *et al.*, 2019). It enhances investor confidence and reflects a firm's ability to generate returns (Pike & Roos, 2004). Pension fund performance significantly impacts members' confidence in their retirement security, as trustees strive to maximize returns while mitigating risks (Andonov *et al.*, 2016). The 2008 financial crisis underscored the importance of pension

performance, with OECD countries losing \$5.4 trillion in assets (Antolín & Stewart, 2009). Key performance determinants include investment returns, administrative costs, and contribution density (Hinz *et al.*, 2010). Research on board characteristics and fund performance shows mixed results, with attributes like size, gender diversity, and financial expertise yielding varying impacts (Ruigrok *et al.*, 2007; Kimeli & Wepukhulu, 2018). This study examines these factors' influence on Kenyan university pension funds to enhance governance and financial outcomes.

Board Size and Financial Performance

Board size refers to the total number of directors or trustees on a board, as defined by Maere *et al.* (2014) and Routledge & Stewart (2016). Pugliese and Wenstop (2007) specify that it includes members with voting privileges, while Mwengei (2016) views board size as a measure of the diversity of knowledge and resources available. Fauzi and Locke (2012) emphasize that board size significantly influences the monitoring and decision-making processes, enhancing financial performance. Larger boards are associated with a broader range of skills and expertise, contributing to improved governance (Corbetta & Salvato, 2004). Research highlights the benefits of larger boards. Brédart (2014) and Maere *et al.* (2014) argue that larger boards counterbalance CEO influence, strengthening control. Mohapatra (2017) supports this, noting that large boards provide better monitoring, broader knowledge, stronger networks, and greater scheduling flexibility. However, Nguyen *et al.* (2015) found in Australia that larger boards influenced CEO compensation based on firm size rather than performance. While larger boards enhance governance capabilities, optimal size remains essential to balance effective oversight with decision-making efficiency.

Gender Diversity and Financial Performance

Board gender diversity has become a crucial area of study in recent years, with researchers exploring its implications for financial performance. Diversity, broadly defined, encompasses differences in demographic and cognitive characteristics among board members, such as gender, age, ethnicity, educational background, and professional expertise (Taljaard *et al.*, 2014; Erhardt *et al.*, 2003). Gender diversity specifically refers to the representation of women on boards and its effects on organizational decision-making and performance (Mwengesi *et al.*, 2016). Research has shown mixed outcomes regarding the relationship between board gender diversity and financial performance. While some studies highlight significant benefits, such as improved risk management, better stakeholder understanding, and enhanced decision-making due to diverse perspectives (Carter *et al.*, 2007; Mohammad *et al.*, 2018), others, like Carter *et al.* (2010), found no direct correlation between gender diversity and firm performance. Nevertheless, the inclusion of women on boards has been associated with improved board

independence, participative communication, and greater monitoring effectiveness (Simpson *et al.*, 2010; Gyapong *et al.*, 2016). Globally, many countries have implemented policies to promote gender diversity in corporate boards. For instance, Norway mandates 40% female board representation, and similar legislative measures exist in Spain and Italy (Rose, 2007; Solimene *et al.*, 2017). Kenya has a constitutional provision on gender parity, while Singapore includes gender diversity in its governance code without making it mandatory (Nguyen, 2018). Such measures reflect the growing recognition of diversity's role in enhancing organizational outcomes and fostering equity. Studies on the effects of gender diversity on financial performance are varied; for example, Ongore *et al.* (2015) found significant positive impacts on Kenyan firms, while Kevin *et al.* (2008) observed similar results in Spain. Conversely, Carter *et al.* (2010) concluded that gender diversity's effects might be context-dependent and linked to other endogenous factors. Chowdhury *et al.* (2022) concur that gender is important in determining individual saving behavior and preparation for retirement. Despite these inconsistencies, the broader consensus suggests that gender-diverse boards contribute to creating more inclusive, innovative, and effective corporate governance structures (Hillman *et al.*, 2002; Terjesen & Sealy, 2016).

Financial Expertise and Financial Performance

Financial expertise plays a pivotal role in effective board governance, directly influencing financial performance and accountability. Defined by the Sarbanes-Oxley Act of 2002, financial experts possess critical qualifications such as knowledge of accounting principles, financial statement preparation, and internal controls, enabling them to ensure accurate reporting and reliable governance. Research underscores the importance of financial expertise in preventing financial scandals and fostering informed decision-making. Studies by Guner *et al.* (2008) and Hasyudeen (2003) demonstrate that board members with financial literacy enhance organizational credibility, strengthen stakeholder trust, and positively impact relationships with regulators and financial institutions. Empirical evidence further validates the correlation between financial expertise and improved financial outcomes. For example, Johl *et al.* (2015) identified a significant positive relationship between accounting expertise and financial performance in Malaysian firms, while Andonov *et al.* (2016) found that pension funds governed by financially experienced trustees achieved superior investment returns.

Portfolio Diversification and Financial Performance

Portfolio diversification, introduced by Harry Markowitz in 1952, aims to maximize returns while minimizing risk by spreading investments across unrelated assets. Markowitz's modern portfolio theory posits that risk can be reduced by combining assets that are not positively correlated, such that poor performance in one can be

offset by better performance in another (Markowitz, 1952). Risk is categorized into two types: systematic risk, tied to market volatility, and unsystematic risk, linked to individual securities. Diversification primarily helps mitigate unsystematic risk, thus reducing portfolio volatility over time. Pension funds, for instance, adopt diversification strategies to ensure consistent performance while balancing risk and return objectives (Pula *et al.*, 2012). Ngugi *et al.* (2018) note that pension fund investments, typically comprising bonds, equities, and real estate, significantly impact financial outcomes and capital market development. Kamwaro (2013) also highlights a positive relationship between financial performance and the size of diversified portfolios, demonstrating the value of spreading investments.

Control Variables: Fund Size and Fund Age

The effect of control variables on a firm's financial performance cannot be overemphasized. Creswell (2013) avers that the purpose of control variables is to isolate the true effect of independent variables on the dependent variable in quantitative analysis. Available studies have shown that a firm's size and age have an impact on financial performance. Temitope *et al.* (2018) studied the effect of fund age, expenditure, contribution density, and idle contributions on financial performance of pension funds in Nigeria as measured by unit price. The age of the fund was found to have a positive and significant effect on financial performance.

MATERIALS AND METHODS

This research was anchored on positivism paradigm and adopted an explanatory design. The study used secondary data extracted from the audited annual returns to the Retirement Benefits Authority. The data related to all the public and private universities in Kenya

Model Specification for a single mediating variable M:
 $ROA = \beta_0 + \beta_1 BDSize + \dots + \beta_2 WoSize + \beta_3 FinExp + \epsilon_i$ (1)

$DivRatio = \beta_0 + \beta_1 BDSize + \dots + \beta_2 WoSize + \beta_3 FinExp + \epsilon_i$ (2)

$ROA = \beta_0 + \beta_5 DivRatio + \epsilon_i$ (3)

$ROA = \beta_0 + \beta_1 BDSize + \dots + \beta_2 WoSize + \beta_3 FinExp + \dots + \beta_5 M + \epsilon_i$ (4)

- Where:
 ROA = Financial performance of the Pension Fund
 $\beta_0, \beta_1, \beta_2, \dots, \beta_5$ are coefficient of the variables
 ϵ 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

Sobel Test of Significance

The following relationship was used to test the significance of the mediation process

$$(a*b)/\sqrt{(b^2*SEa^2) + (a^2 * SEb^2)}$$

Where:

a = coefficient for path a

SEa = Standard Error term for path a

b = coefficient for path b

Data Collection Procedure

Secondary data as contained in the financial documents and other supportive documents. The study used panel data for a period of eight years 2015 to 2022. Financial data related to members and sponsor’s contributions, performance and investment returns was sort from the financial reports of the pension funds for the years under survey as presented to the members in the annual general meetings and as submitted to the Retirement Benefits Authority. This data included investment assets, net plan assets, liabilities, sponsor and employee contributions, investment income, investment expenses and administrative expenses returns for each asset of class and fund investment return.

RESULTS AND DISCUSSION

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, with a ranging between 4 and 14 with a standard deviation of 1.204. This indicates moderate consistency across the sample, aligning with prior studies such as 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.

Table 1: Results for Descriptive statistics

Statistics	N	Min	Max	Mean	SD
Fund Age	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 2024

Correlation Analysis Results

The correlation analysis explored the relationships between key variables in a study of 26 Kenyan university pension funds over eight years using Pearson correlation coefficients, ranging from -1 (strong negative) to +1 (strong positive). The results revealed significant insights into the relationship between fund board characteristics and financial performance. Board size displayed a positive correlation (0.7800), emphasizing that larger boards enhance governance and financial performance. Akwimbi and Lishenga (2019) found that corporate governance indicators had a positive and significant effect on pension fund performance in Kenya. However, this finding disagreed with Manyaga *et al.* (2018), who found that board size had a negative but significant impact on financial performance.

Women size correlated positively (0.4121) with ROA, highlighting the benefits of gender diversity, while financial expertise also positively correlated (0.4942) with ROA, showing that financially knowledgeable boards

improve financial performance. This aligns with research by Kowalewski (2012), who found that financial expertise enhances financial performance. However, diversification ratio had a negative correlation (-0.4181), implying that highly diversified funds may experience diluted returns compared to more focused strategies. Kowalewski (2012) also indicated that combining governance mechanisms into an index reduces their predictive power for efficiency, suggesting that diversification in governance approaches may dilute effectiveness.

Fund age showed a negative correlation with ROA (-0.5161), indicating that older funds tend to have lower returns, likely due to conservative growth strategies. In contrast, fund size had a positive correlation (0.8760), suggesting that larger funds benefit from economies of scale and diversification. The strong positive correlation between fund size and ROA (0.8760) confirms that larger funds experience higher financial performance, while the negative correlation between fund age and ROA (-0.5161) suggests that aging funds may face diminishing returns.

Table 2: Correlation Analysis Results

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

* Sig = significant at 0.05

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

Regression Results for Direct Effects

This research aimed to examine the mediating role of portfolio diversification, represented by DivRatio, on the relationship between board of trustee characteristics (Board Size, Gender Diversity, and Financial Expertise) and the financial performance of university pension funds in Kenya, measured by ROA. A random effects regression model was applied, controlling for fund age and fund size. The model's overall R-squared value of 0.7889 indicates that 78.89% of the variation in ROA is explained by the independent variables, demonstrating a good model fit. The within-group R-squared value of 0.7726 shows 77.26% explanatory power within the same year, while the between-group value of 0.9534 reflects high explanatory strength across groups. A Wald chi-squared statistic of 751.05 with a p-value of 0.0000 confirms the model's statistical significance, indicating that the independent variables collectively have a significant impact on pension fund performance.

The study tested the direct effects of board characteristics—board size, gender diversity (WoSize), and financial expertise—on financial performance. The regression results found that board size had a positive and significant effect on ROA ($\beta = 0.0193$, $p = 0.0001 < 0.05$). This evidence aligns with Coles *et al.* (2008), who noted that larger boards benefit complex organizations by providing diverse knowledge. Similarly, Tijjani (2012) highlighted the positive impact of board size on pension fund sustainability in Nigeria. Therefore, the findings emphasize that board size plays a crucial role in enhancing financial performance, reinforcing the importance of governance structure in pension fund management.

The study analyzed the effect of gender diversity on the financial performance of university pension funds in Kenya. The results show that gender diversity, as denoted by WoSize ($\beta = 0.0007$, $p = 0.022 < 0.05$), had a significant and positive impact on ROA. Adding one woman to the board increases ROA by 0.0007 units. This finding aligns with prior research by Ongore *et al.* (2015), who observed a significant link between gender diversity and firm performance in Kenya. Kevin *et al.* (2008) also noted a positive effect on firm value in Spain. Simpson *et al.* (2010) highlighted how more female board members

promote participative communication. Gyapong *et al.* (2016) further emphasized that diversity, including women and minority representation, enhances board independence and monitoring, contributing to better financial outcomes.

The findings in Table 3 indicate that financial expertise has a coefficient of $\beta = 0.0981$, $p = 0.005 < 0.05$, confirming its statistical significance. For every unit increase in financial expertise, financial performance increases by 0.0981 units. The importance of financial expertise on the board cannot be overemphasized. Guner *et al.* (2008) opined that board members with financial expertise significantly influence firms' financial and investment policies. Johl *et al.* (2015) found a positive and significant relationship between accounting expertise and financial performance. Andonov *et al.* (2016) found that financial literacy is a key factor in determining pension fund board performance.

A regression was conducted to test the direct relationship between pension fund board characteristics and portfolio diversification, as shown by DivRatio. The results indicate that board size has a negative coefficient (-0.2879), suggesting that as board size increases, diversification decreases. The p-value of 0.000 indicates a strong statistical significance at the 1% level. These findings support past research indicating that board size influences a fund's investment decisions, including portfolio diversification. Larger boards can suffer from coordination issues and inefficiencies, leading to suboptimal diversification strategies (Adams & Ferreira, 2020; Kweh *et al.*, 2021). Moreover, smaller boards are often associated with stronger oversight and more cohesive decision-making, which enhances portfolio management (Harris & Raviv, 2018). Odhiambo (2016) found that factors such as gender and average age of board members negatively correlate with diversification.

The coefficient for gender diversity (WoSize) is -0.0259, indicating a negative but small effect on portfolio diversification. The standard error is 0.0015, and the p-value is 0.042, showing statistical significance. Past research supports the benefits of gender-balanced boards for firm performance (Carter *et al.*, 2010; Liu *et al.*, 2014; Rose, 2007; Abad & Saona, 2022). Jin *et al.* (2014) found

that the impact of gender diversity varies by market development and firm structure.

The effect of financial expertise on portfolio diversification is positive ($\beta = 0.0981$, $p = 0.005$), confirming its statistical significance. These findings align with recent research indicating that financial expertise influences investment allocations and diversification (Andonov & Rauh, 2020; Pagliaro & Utkus, 2020; Morales & Stewart, 2022). Additionally, Kandie *et al.* (2024) found that board

gender diversity mediates the relationship between capital structure and financial performance, highlighting the role of financial expertise in shaping financial outcomes.

Finally, the regression of ROA against DivRatio (Table 4.7.3) produced a coefficient of 0.265 and a p-value of 0.000, indicating strong significance at the 1% level. This result suggests that portfolio diversification has a positive and significant effect on financial performance, aligning with past studies (Garcia & Xu, 2021; Smith, 2022).

Table 3: Regression Results for Board Characteristics and Financial Performance

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	0.000100 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)

The Mediating Role of Portfolio Diversification

Portfolio Diversification ratio was used as the mediator, measured by diversification ratio and was captioned as DivRatio. The study was conducted using three independent variables namely fund size, women size and financial expertise being mediated by the diversification ratio. Three direct effects were generated for Board Size, Gender Diversity and Financial expertise. Three mediated effects were also generated H_{01} , H_{02} , and H_{03} .

H_{01} : Portfolio Diversification Does Not Mediate Between Board Size and Financial Performance

Path ‘a’ which shows the relationship between board size (BDSIZE) and diversification ratio (DivRatio) is statistically significant, with a negative coefficient of -0.526 and a p-value of 0.000. This implies that as board size increases, the diversification ratio decreases by 0.526 units. Path ‘b’ (Diversification Ratio to ROA) has a coefficient of 0.032 and a p-value of 0.524 indicating that the effect of DivRatio on return on assets (ROA) is statistically insignificant. This suggests that diversification ratio does not have a significant impact on ROA in the model. Direct Path ‘c’ (Board Size to ROA) for direct of board size on ROA is highly significant, with a coefficient of 0.797 and a p-value of 0.000. This indicates a strong positive relationship between board size and financial performance, bypassing the mediator. The insignificant relationship between DivRatio and ROA (path b) confirms the absence of a meaningful mediation effect of DivRatio between BDSIZE and ROA. 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 ± 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. Thus, the relationship between board size and return on assets is primarily direct. This supports the null hypothesis that portfolio diversification does not mediate the relationship between board size and financial performance of university pension schemes in Kenya. These findings align with Coles *et al.* (2021) who observed that large boards often prefer conservative strategies, favoring stable investments over diversification. Similarly, Rumelt (2022) found that diversification does not universally enhance firm value and can, in some cases, negatively affect performance due to inefficiencies and complexities.

H_{02} : Portfolio Diversification Does Not Mediate the Relationship between Board Gender and Financial Performance

The study also examined whether portfolio diversification mediates the relationship between board gender diversity (WoSize) and financial performance (ROA). From the results, Path ‘a’ indicates a significant negative relationship between board gender diversity and DivRatio ($\beta = -0.266$, $p = 0.000$), suggesting that boards with higher female representation pursue lower diversification levels, likely due to a risk-averse approach prioritizing core operations. Path ‘b’ reveals a negative and significant relationship between DivRatio and ROA ($\beta = -0.298$, $p = 0.000$). This implies the presence of a partial mediation. Despite this, the direct effect (Path c) of WoSize on ROA remains positive and significant ($\beta = 0.333$, $p = 0.000$), highlighting the benefits of gender-diverse boards, such as diverse perspectives, improved governance, and cautious decision-making. The Sobel test ($Z = 3.213$) confirms significant partial mediation, as the presence of gender still directly enhances ROA

even when portfolio diversification is considered. These findings align with prior research, such as Adams and Ferreira (2012), which suggests women on boards favor focused, less risky strategies that enhance financial performance. The study rejects the null hypothesis and concludes that diversification significantly mediates the WoSize-ROA relationship in Kenyan university pension funds. Additionally, the negative relationship between diversification and ROA supports the findings of Lee and Li (2020), who argue excessive diversification, can lead to managerial inefficiency. By limiting diversification, gender-diverse boards may improve operational efficiency, reinforcing the positive impact of gender on ROA.

H₀₃: Portfolio Diversification Does Not Mediate the Relationship between Financial Expertise and Financial Performance

The study equally examined whether portfolio diversification mediates the relationship between financial expertise and financial performance. The results revealed that there is a partial diversification Path “a” shows a significant negative relationship between Financial expertise and Diversification ($\beta = -0.250$, $p = 0.001$) suggesting that financially skilled boards prioritize core operations over diversification which aligns with Chen and Ho (2021). Path “b” confirms a negative relationship between DivRatio and ROA ($\beta = -0.280$, $p = 0.000$), indicating that higher diversification levels reduce financial performance, supporting Lee and Li (2020). The direct effect (Path c’) of Finexp on ROA remains positive and significant ($\beta = 0.310$, $p = 0.000$), highlighting that financial expertise enhances performance through prudent decision-making and resource allocation. The Sobel test ($Z = 2.880$) confirms significant mediation, though the persistence of a strong direct effect suggests partial mediation. These findings reject the null hypothesis, confirming that diversification mediates the Finexp-ROA relationship in university pension funds. However, the partial mediation underscores the dual role of financial expertise in directly driving financial performance while also influencing diversification strategies. This aligns with Tsui and Lam (2019), who emphasized the importance of financial expertise in fostering efficiency and profitability through strategic focus.

CONCLUSIONS

This study examined the mediating role of portfolio diversification in the relationship between board characteristics; board size, gender diversity and financial expertise and financial performance as measured by return on assets (ROA). The findings provide mixed evidence regarding the significance of diversification as a mediator. For board size, results indicate that while an increase in board size negatively affects diversification, the diversification ratio does not significantly influence ROA. The strong direct relationship between board size and financial performance suggests that diversification does not serve as a meaningful mediator in this context. These

findings support the null hypothesis (H01), affirming that board size directly impacts financial performance, with no substantial mediation effect from diversification. Conversely, for board gender diversity, the study finds a significant partial mediation effect. Gender-diverse boards tend to pursue lower levels of diversification, likely adopting more risk-averse strategies. Additionally, the negative relationship between diversification and financial performance supports the assertion that excessive diversification can hinder efficiency. However, the positive and direct effect of gender diversity on ROA remains strong; indicating that gender diversity enhances financial performance beyond the influence of diversification. Similarly, financial expertise exhibits partial mediation. Boards with strong financial expertise prioritize core business operations over diversification, leading to improved financial outcomes. The significant direct effect of financial expertise on ROA reinforces the idea that financially skilled boards contribute directly to better financial performance. Overall, the study confirms that while diversification plays a mediating role in some cases, particularly with gender diversity and financial expertise, its effect is not universal. These findings underscore the importance of board composition in shaping financial strategies and outcomes in university pension funds.

Recommendations

The pension funds are encouraged to optimize board composition for improved financial performance. This is derived from the fact that there is a strong direct impact of board size and financial expertise on financial performance. Boards should also include more financially skilled members to enhance prudent investment strategies and improve fund performance. Since gender diversity positively influences financial performance, regulators should develop policies that promote female representation on pension fund boards. This can be achieved through implementing gender quotas or giving incentives like tax reliefs for funds with diverse boards. Excessive diversification has been seen as negatively impacting financial performance of pension funds. Pension funds should therefore focus on the best portfolio mix that would optimize financial performance. The Retirements Benefits Authority should provide guidelines on the appropriate levels of portfolio diversification to prevent inefficiencies and ensure alignment with financial goals of the pension industry.

Recommendations for Future Research

Future research should look at a longer period of study to analyze how board composition and diversification strategies influence financial performance over extended periods. This would provide deeper insights into causal relationships among the variables of study. Future studies can increase the number of variables like education background, age of trustees, tenure, outside trustees which may influence financial performance. Other

performance metrics like ROE and ROI can be employed to give a more comprehensive analysis.

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