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DIVERSIFICATION IN BONDS FINANCIAL PERFORMANCE OF PRIVATE VOLUNTARY PENSION SCHEMES IN KENYA

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Abstract

The pension sector in Kenya has experienced fluctuating financial performance over the past four years despite consistent growth in total assets, which reached KSh 2.25 trillion in 2024 (RBA, 2024). Performance challenges are particularly evident at the scheme level, with leading private voluntary pension schemes such as the CPF Individual Pension Scheme recording mixed outcomes. This study assessed the effect of bond diversification on the financial performance of private voluntary pension schemes in Kenya, guided by the Income Stability Theory, which highlights the role of predictable income from fixed-income securities in reducing portfolio volatility. A descriptive research design was used, targeting all 50 private voluntary pension schemes (22 individual and 28 umbrella schemes) and incorporating 150 respondents

finance managers, investment officers, and fund managers through a census approach. Primary data were collected via semi-structured questionnaires, and secondary data on returns were obtained from 2019–2023 financial statements. Reliability and validity were confirmed through a pilot test with 15 respondents and Cronbach's Alpha. Data were analyzed using descriptive statistics (percentages, frequencies, means, standard deviations) and inferential statistics (correlation and multiple linear regression). Findings revealed a significant positive relationship between bond diversification and financial performance, with schemes that allocated across multiple bond categories achieving greater income stability and reduced risk exposure. The study concluded that bond diversification is a key stabilizing mechanism, providing reliable income and cushioning against market volatility, thereby enhancing overall performance. From the findings the study recommended that fund managers should adopt strategic bond diversification, balancing government-backed and selective higher-yield securities, while the Retirement Benefits Authority should support access to diverse bond instruments and provide ongoing training on fixed-income portfolio management to promote sustainable retirement outcomes.

Keywords: Diversification in Bonds, Financial Performance, Private Voluntary Pension Schemes

INTRODUCTION

Bond diversification refers to the strategic allocation of pension fund investments across a range of fixed-income securities, including government bonds, corporate bonds, treasury bonds, infrastructure bonds, foreign bonds, and Eurobonds, to mitigate risk and enhance return stability (Vishwanath, 2021; Nyora, 2021). Unlike concentrated bond holdings that expose schemes to specific issuer or interest rate risks, bond diversification emphasizes spreading investments across varying maturities, credit qualities, and geographies to generate predictable income streams while cushioning against market volatility (Bozena & Kotaskova, 2019). This approach has gained prominence for private voluntary pension schemes, where the need to balance income reliability with long-term growth is critical to meeting retirement obligations amid fluctuating economic conditions (RBA, 2023).

Globally, bond diversification has been recognized as an essential strategy for strengthening the financial resilience and performance of pension funds. For instance, pension schemes in the United States that increased allocations to diversified bond portfolios, including treasury and high-grade corporate bonds, achieved greater income stability and reduced portfolio volatility during market downturns (Munnell & Hou, 2023). In Europe, schemes incorporating government and infrastructure bonds alongside selective corporate and foreign

issues recorded improved risk-adjusted returns and enhanced capacity to honor member payouts (Börsch-Supan et al., 2023). These examples demonstrate that well-executed bond diversification contributes significantly to the sustainability and performance of pension funds in varied economic environments.

In Africa, bond diversification has emerged as a key mechanism for pension schemes to manage risk and secure stable returns amid macroeconomic challenges. Evidence from South Africa shows that retirement funds diversifying into government securities, corporate bonds, and infrastructure bonds benefited from reliable coupon payments and lower exposure to equity market fluctuations, thereby improving overall financial performance (Pienaar, 2022). Similarly, in Nigeria, pension funds that incorporated a mix of domestic and foreign bonds enhanced income predictability and mitigated currency and credit risks, supporting long-term fund growth (Okafor, 2022). These findings highlight the value of bond diversification in fostering financial stability within African pension systems.

In East Africa, bond diversification has become increasingly relevant as pension schemes seek to counter inflation pressures and revenue constraints while ensuring consistent returns. Studies indicate that funds allocating across government-backed securities, infrastructure bonds, and selective corporate issues are better positioned to maintain income stability and support member benefits (Asiedu & Agyeman, 2022). However, challenges such as limited access to high-quality foreign bonds and regulatory constraints often hinder optimal diversification, underscoring the need for strategic approaches tailored to regional market dynamics (Mensah & Ofori, 2023).

In Kenya, private voluntary pension schemes operate within a context of evolving investment guidelines and persistent inflationary pressures that impact real returns. Schemes are encouraged to diversify bond holdings to capitalize on low-risk government securities and infrastructure bonds, which offer tax advantages and stable yields, while selectively incorporating corporate and foreign bonds for enhanced income potential (RBA, 2023; Cytonn, 2024). Bond diversification strategies, including investments in treasury bonds, infrastructure bonds, and Eurobonds, are viewed as vital for generating reliable interest income, reducing portfolio volatility, and improving overall financial performance (Nzau, Kung'u & Onyuma, 2019). Schemes that effectively diversify in bonds are more likely to achieve sustained returns, better risk management, and greater member confidence in retirement security (Kenga & Banafa, 2025).

Financial performance is the evaluation of a company's or organization's financial health and efficiency in achieving its financial objectives (Barr, 2021). It involves analyzing various financial metrics and indicators to assess the profitability, liquidity, solvency, and overall

effectiveness of an entity's financial operations (Almajali, 2020). Financial performance is crucial for investors, stakeholders, and management as it provides insights into the organization's ability to generate profits, manage resources, meet obligations, and create value for its shareholders (Siro, 2021). In the context of private pension schemes, financial performance refers to the ability of the scheme to effectively manage its financial resources in a way that ensures the sustainability, growth, and ability to meet future retirement obligations to its members (RBA, 2022).

It is a measure of how well the scheme is generating returns on investments, maintaining solvency, and operating efficiently. For individual pension funds, financial performance is reflected in their ability to accumulate sufficient retirement savings for contributors while minimizing risks associated with investment portfolios (OECD, 2021). Similarly, for umbrella pension funds, financial performance is evaluated based on their ability to pool contributions from multiple employers, diversify investments efficiently, and optimize returns to enhance retirement security for members (World Bank, 2020).

Statement of the Problem

The pension sector in Kenya has exhibited fluctuating financial performance over the last four years despite consistent growth in total assets under management. According to the Retirement Benefits Authority (RBA, 2024), the industry’s total assets grew to KSh 2.25 trillion; however, investment returns have remained erratic. In 2024 the pension industry performance has varied from weighted average return of 7.0 percent in 2020, 11.6 percent in 2021, 1.7 percent in 2022, 1.6 percent in 2023, 13.2 percent in2024 and quarter 2025 up to June 2025 6.6 percent. Consequently, the sector continues to face challenges in achieving stable, risk-adjusted returns, raising concerns about its long-term sustainability and its ability to safeguard contributors’ retirement savings.

A review of specific private voluntary pension schemes reveals that these performance challenges are particularly pronounced at the scheme level. For instance, the CPF Individual Pension Scheme, one of Kenya’s leading private voluntary pension schemes, has recorded mixed financial outcomes over the past three years. The scheme’s assets increased from KSh 2.88 billion in 2021 to KSh 4.11 billion in 2023, however, this growth has not consistently translated into high investment returns. Furthermore, CPF Group’s decline in net assets from KSh 31.26 billion in 2022 to KSh 26.99 billion in 2023..Similarly, the Pan Africa Life Personal Pension Plan, another key private voluntary pension scheme in Kenya, has exhibited comparable fluctuations in performance. While the plan’s assets under management rose from approximately KSh 5.2 billion in 2021 to KSh 6.4 billion in 2023, the returns have remained

inconsistent due to overreliance on low-risk, low-yield asset classes. In 2022, the scheme's performance dipped following a slump in the equity market, only to record a mild recovery in 2023 as fixed-income returns stabilized. However, the plan's limited exposure to high-return investments such as immovable property and private equity continues to constrain its overall portfolio performance. This pattern demonstrates how insufficient diversification among private voluntary pension schemes contributes to volatile returns and weak financial growth. Therefore, this study seeks to establish the effect of diversification in bonds on financial performance of private voluntary pension schemes in Kenya.

THEORETICAL FRAMEWORK

Income Stability Theory

The study was anchored on income stability theory. The theory was developed by Keohane's in 1989. The concept of income stability theory focuses on the relationship between a company's income stability and its risk and value. It suggests that companies with more stable and predictable income streams are generally perceived as less risky and therefore have higher value. The income stability theory suggests that the stability and predictability of a company's income play a crucial role in determining its risk profile and value. According to the theory, companies with stable and consistent earnings are perceived as having lower risk because they are better equipped to meet their financial obligations and sustain their operations over time. As a result, these companies are often assigned higher valuations by investors compared to companies with volatile or uncertain income streams, (Elliott, 2010).

The theory acknowledges the importance of income stability in influencing investors' perceptions of risk. Companies with stable income are considered less risky, as they are better positioned to navigate challenging economic conditions or industry downturns. This perception can lead to higher investor confidence, lower borrowing costs, and enhanced market value for such companies (Francis, Olsson, & Oswald, 2000). Income stability can result in a valuation premium for companies. Investors are willing to pay a higher price for shares of companies with stable income, reflecting their expectation of consistent returns and reduced uncertainty. Empirical studies have shown that companies with more stable earnings tend to have higher price-earnings (P/E) ratios, indicating a valuation premium (Biddle, Hilary, & Verdi, 2009).

Penman, (2000) criticized the theory in the sense that defining and quantifying income stability can be subjective. Various measures, such as earnings volatility, earnings growth consistency, or cash flow predictability, can be used to assess income stability. The choice of measure may vary depending on the industry, accounting practices, and other factors. This

subjectivity can introduce challenges in comparing income stability across companies or industries.

The income stability theory emphasizes the importance of steady and predictable income flows in financial planning and investment management. This theory is particularly relevant to the diversification of pension portfolios into bonds, which typically provide fixed interest (coupon) payments and are generally considered lower risk compared to equities. For private voluntary pension schemes, investing in government and high-grade corporate bonds contributes to income stability, helping to offset the variability in returns from more volatile assets. Bonds also serve as a stabilizing anchor in diversified portfolios, especially during periods of equity market downturns, thus promoting consistency in earnings. According to the theory, schemes that diversify adequately into bonds are better positioned to meet periodic payout obligations to retirees, while enhancing overall financial performance by reducing income volatility. In this study, the theory justifies the hypothesis that bond diversification significantly influences the financial sustainability and reliability of pension schemes.

EMPIRICAL REVIEW

Bozena and Kotaskova, (2019) conducted a study on the impact of stocks and bonds on pension fund performance in Slovakia. The paper investigated the connection between stock, and, respectively bond market and pension funds. The relationship between the pension market and representative stock and bond market indexes was confronted. Research data based on pension statistics from the organization for economic co-operation and development were included in the research. The study findings revealed that a stronger impact was shown of the bond market on pension fund performance. However, the study was conducted in Slovakia and focused on the general performance of the pension funds while the current study will specifically focus on the financial performance of the pension funds.

Nzau, Kung'u and Onyuma, (2019) conducted a study on the effect of bond issuance on financial performance of firms listed on Nairobi securities exchange. The study collected dated from all the six firms that had issued bonds in tranches or additional bonds within the period 2008 to 2017. Data was analyzed via regression to assess whether bonds issuance has any effect on the financial performance of firms listed on NSE. Results indicate that about 75.4 percent of variance in financial performance could be explained by bond issuance as characterized by bond price, bonds coupon rate, bond proportion, and bond yield to maturity. Bond proportion and bond yield to maturity were found to have a statistically significant effect on financial performance. The study concluded that bond issues affected financial performance of listed firms in Kenya. It was recommended that the listed firms ought to take into consideration

the various aspects of bond issues in order to enhance their financial performance. Nonetheless the study focuses on the bond issuance on financial performance of firms listed on Nairobi securities exchange while the current study will focus bond diversification and financial performance of Private Pension scheme.

Muhhamed (2020) conducted a study on the relationship between bond prices and company performance for firms that engage in sustainability reporting in Nairobi Kenya. The target population consisted of 12 companies listed on Nairobi Securities exchange during the period of year 2012-2014. The secondary data was collected from Nairobi securities exchange and used Statistical Package for Social Sciences (SPSS) to analyze. The findings were that the coefficient of variable demonstrates that the shares prices have positive association to return on Assets (ROA). Hence, the result of this research shows that the bond prices of firms that engage in sustainability reporting does influence a company's performance. However, the study was conducted in both financial and non-financial institutions; the target population consisted of 12 companies listed on Nairobi Securities exchange during the period of year 2012-2014 which engages in sustainability reporting. The study collected only secondary data. While the current study will collect both primary and secondary data. The study will solely focus on the private pension schemes in Kenya.

Obong'o, Mutea and Rintari (2020) did a study on the influence of convertible bonds on liquidity growth of commercial banks in Nairobi County Kenya. The study applied descriptive research design when gathering data by close ended questionnaires on 39 commercial banks in Nairobi County Kenya and secondary data from commercial banks dating from 2016-2018. Census technique was used. The study found out that there was a statistically significant positive relationship between convertible bonds and liquidity growth of commercial banks in Nairobi County Kenya. Nonetheless, the study was conducted among the commercial banks and collected only primary data as opposed to the current study which will use both primary and secondary data.

Yeow, and Huei, (2021) did a study on the impact of green bonds on corporate environmental and financial performance in china. The sample was collected from among the green bond and conventional bond issues between 2015 and 2019 issued by corporations from various countries. Using the propensity score matching (PSM) and then difference-in-difference (DiD) approaches; two sub-groups (green bond and conventional bond issuers) were generated for comparison. Changes in environmental and financial performance over time between the sub-groups are then examined. The overall results show that green bonds are effective in improving environmental performance, but only when they are certified by third parties. Additionally, green bonds do not have an impact on financial performance. The findings imply

that green bonds' dependency on external certification may be a consequence of an underdeveloped green bond market, where weak governance still dominates the green bond market. Because of this, corporations tend to take advantage of green finance's growing popularity, causing the green washing problem. However, the study focused on both corporate environmental and financial performance in China while the current study will focus on the financial performance of the private pension schemes in Kenya.

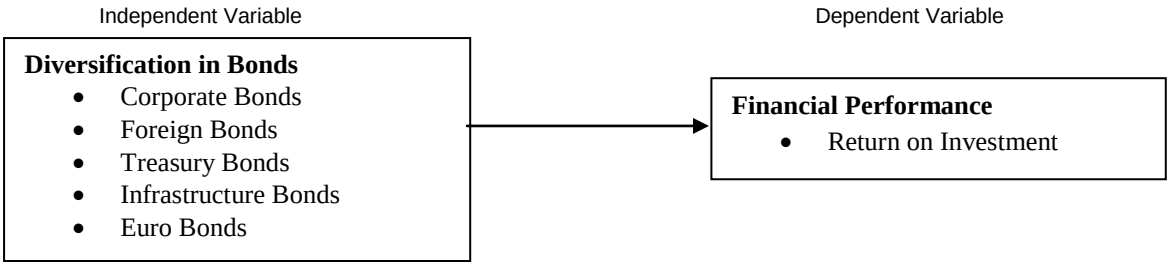

Figure 1: Conceptual Framework

METHODOLOGY

The study was guided by a positivist research philosophy, which emphasizes objectivity and the reliance on empirical evidence to establish causal relationships between variables. Consistent with this philosophical stance, the study adopted a descriptive research design to examine the effect of diversification in bonds on the financial performance of private voluntary pension schemes in Kenya. This design was considered appropriate because it facilitated the systematic description of existing investment practices in bonds while enabling the testing of hypothesized relationships between bond diversification strategies and financial performance outcomes. The unit of analysis was 22 voluntary pension schemes and 28 registered umbrella retirement benefits schemes. The unit of observation was 50 finance managers, 50 investments officers and 50 fund managers. Since the study population is manageable the study adopted census technique to incorporate all the 150 respondents. Primary data were collected through self-administered semi-structured questionnaires designed to capture quantitative information on bond diversification practices and their perceived impact on financial performance. Secondary data on financial performance, specifically return on investment, were obtained from the annual financial statements of the respective private voluntary pension schemes for the period 2019 to 2023. The pilot study was conducted, involving five selected schemes, Gencap Individual Pension Plan, NTISL Personal Pension Plan, Fusion Umbrella Retirement Benefits Scheme, Kenindia Umbrella Provident Fund, and Octagon Umbrella Retirement Benefits Scheme, with 15 questionnaires administered to assess the reliability and validity of the research instrument.

Validity was established through exploratory factor analysis and expert review, while reliability was evaluated using Cronbach's Alpha, with a threshold of 0.7 accepted as indicative of adequate internal consistency. Both descriptive and inferential statistics were utilized for data analysis. Descriptive statistics, including percentages, frequencies, means, and standard deviations, were employed to summarize the characteristics of bond diversification practices and financial performance indicators. Inferential statistics, specifically correlation analysis and multiple linear regression analysis, were applied to test the hypothesized relationship between diversification in bonds and financial performance. Diagnostic tests were performed to confirm the assumptions of regression, including normality, multicollinearity, linearity, and homoscedasticity, thereby ensuring the robustness of the results. Data analysis was conducted using the Statistical Package for Social Sciences (SPSS), and findings were tabulated.

RESEARCH FINDINGS AND DISCUSSION

Response Rate

The researcher issued out 150 questionnaires to the respondents. Out of 150 questionnaires issued, 118 were successfully filled and returned for analysis thus giving the study 78.7% response rate.

Table 1: Response Rate

Response	Frequency	Percentage (%)
Expected response	150	100
Received response	118	78.7
Un-received response	32	13

Demographic Data

Length of Service in Pension Scheme

The study sought to assess the duration for which the respondents had been working in, or providing services to, voluntary private pension schemes. The results of this analysis are presented in Table 2.

Table 2: How long have you been working in the pension scheme sector

Length of Service	Frequency	Percentage
Less than 3 Years	24	20.3
4-6 Years	39	33.1
7-10 Years	42	35.6
More than 10 Years	13	11.0
Total	**118**	**100.00**

From the findings 20.3 per cent of the have been working in the sector for less than 3 years. This indicates a relatively smaller group of newer employees in the sector. The next group, which has been working for 4-6 years, constitutes 33.1 per cent of the respondents, showing a significant portion of mid-career professionals. The largest group, 35.6 per cent, has been in the sector for 7-10 years, suggesting that most respondents have accumulated substantial experience. Finally, 11.0 per cent of the respondents have more than 10 years of experience, reflecting a smaller, yet highly experienced, group within the workforce. The duration of service of finance officers plays a crucial role in shaping their understanding of financial performance within private voluntary pension schemes. Officers with longer tenure, such as those with 7-10 years or more than 10 years of experience, are likely to have developed a deep understanding of the complexities involved in managing pension funds. Their exposure to different market conditions, investment strategies, regulatory changes, and economic cycles allows them to make more informed decisions about portfolio diversification, and long-term financial stability. This accumulated knowledge positions them to better navigate challenges that affect the financial performance of pension schemes, such as market volatility or shifting economic conditions.

Size of the Private Voluntary Pension Scheme

The researcher further sought to assess the size of the private voluntary pension scheme in terms of membership base. The findings were as indicated in table 3.

Table 3: Size of the Private Voluntary Pension Scheme

Membership	Frequency	Percentage
Less than 1000 members	32	27.1
1001-20,000 members	60	50.8
40,001-60,000 members	11	9.3
60,001-80,000 members	9	7.6
More than 80,000 members	6	5.2
Total	**118**	**100.0**

From the findings, 21% of the respondents had attained a certificate as their highest level of education, 26% had a diploma, 36% had a bachelor's degree, while 17% had a master's degree. This implies that the majority of the respondents had attained a bachelor's degree, representing the largest proportion (36%) of the workforce. A notable number of respondents also had a diploma (26%), indicating that a substantial portion of the staff possessed mid-level qualifications. The presence of respondents with master's degrees (17%) further shows that the

county government also benefits from a segment of highly skilled personnel. Overall, the findings suggest that the workforce is relatively well-educated, with most respondents having at least a diploma or higher qualification, thereby enhancing the county government's capacity to implement and manage financial and administrative functions effectively.

Descriptive Findings

Diversification in Bonds on Financial Performance

The researcher further sought to assess the level of agreement with the statements on the influence of diversification in bonds on the financial performance of private voluntary pension schemes in Kenya. The response was rated from 1-5 where indicated the lowest meanwhile 5 indicated the highest mean. Key SA=Strongly Agree, A=Agree, U=Undecided, D=Disagree, SD=Strongly Disagree. The study findings were as indicated in table 4

Table 4: Diversification in Bonds on Financial Performance

	SA (%)	A (%)	U (%)	D (%)	SD (%)	Mean	Std
Government bonds are low risk investment which enhances financial performance of pension scheme	38	42	13	5	2	4.1017	.92810
Government bonds provide regular interest payment (coupon) which offer reliable income stream for pension funds.	42	41	10	5	2	4.1695	.92732
Pension scheme invest in corporate bonds because they offer higher yields compared to government bonds	34	38	15	8	4	3.8814	1.10298
Corporate bonds help pension to diversify in credit risk which enhances financial performance.	30	42	17	8	3	3.9153	1.03425
Foreign bonds offer currency diversification benefits which enhances financial performance of pension scheme	32	39	19	7	3	4.0254	.96487
Foreign bonds provide pension scheme with access to investment opportunities in international markets	36	41	17	4	3	4.0339	.97781
Investing in treasury bonds offers different maturities, ranging from short-term to long-term which provides steady cash flow for the pension fund.	36	42	13	6	3	4.0085	.95627
Treasury bonds allows pension schemes to align their investment strategy with their specific cash flow needs	35	41	17	6	2	3.9576	.98184
Through infrastructure bonds pension schemes contribute to the country's growth while benefiting from stable returns	31	44	15	7	3	3.9322	.95835
Investing in Eurobonds allows pension schemes to diversify geographically and access opportunities in European markets.	30	42	19	7	2	3.8644	1.00354
Eurobonds offer access to international markets without being directly exposed to fluctuations of euro thus reducing currency risk.	29	42	19	7	3	3.8983	.85124

From the findings 38 per cent of respondents strongly agreed that government bonds are low risk investment which enhances financial performance of pension scheme, 42 per cent agreed, 13 per cent were undecided, 5 per cent disagreed, and 2 per cent strongly disagreed that government bonds are low-risk investments that enhance the financial performance of pension schemes. The mean was 4.1017, with a standard deviation of 0.92810, demonstrating broad support for the role of government bonds in pension fund stability. In addition, 42 per cent of respondents strongly agreed that government bonds provide regular interest payment (coupon) which offer reliable income stream for pension funds, 41 per cent agreed, 10 per cent were undecided, 5 per cent disagreed, and 2 per cent strongly disagreed that government bonds provide regular interest payments (coupon) which offer reliable income streams for pension funds. The mean was 4.1695, and the standard deviation was 0.92732, signifying a strong agreement that such investments yield consistent returns. From the findings the study are in tandem with those of Saleh (2018) which examined the role of government bonds in enhancing the financial performance of pension funds in Kenya. The study highlighted that government bonds provide reliable interest payments that ensure a stable income stream, contributing positively to the financial stability and growth of pension schemes. This aligns with the statement that government bonds are a dependable source of income for pension funds due to their regular coupon payments.

Furthermore 34 per cent of the respondents strongly agreed that pension scheme invest in corporate bonds because they offer higher yields compared to government bonds, 38 per cent agreed, 15 per cent were undecided, 8 per cent disagreed, and 4 per cent strongly disagreed that pension schemes invest in these bonds because they offer higher yields compared to government bonds. The mean was 3.8814, with a standard deviation of 1.10298, indicating a favorable view towards corporate bonds for generating higher returns. In addition, 30 per cent of the respondents strongly agreed that corporate bonds help pension to diversify in credit risk which enhances financial performance, 42 per cent agreed, 17 per cent were undecided, 8 per cent disagreed, and 3 per cent strongly disagreed that such bonds enhance financial performance. The mean was 3.9153, and the standard deviation was 1.03425, showing moderate agreement on the risk mitigation benefits of corporate bonds. The study conquers with the findings of Chepkorir (2018) which focused on the diversification benefits of corporate bonds for pension funds. The research found that corporate bonds provide pension schemes with the opportunity to diversify credit risk by investing in different companies with varying credit profiles. This diversification enhances the financial performance of pension schemes by balancing risk and return, which supports the statement regarding the benefits of corporate bonds for pension funds.

The findings also indicated that 32 per cent of the respondents strongly agreed that foreign bonds offer currency diversification benefits which enhances financial performance of pension scheme, 39 per cent agreed, 19 per cent were undecided, 7 per cent disagreed, and 3 per cent strongly disagreed that these bonds offer currency diversification benefits that enhance financial performance. The mean was 4.0254, and the standard deviation was 0.96487, indicating positive perceptions towards currency diversification through foreign bonds.

Similarly, 36 per cent of the respondents strongly agreed that foreign bonds provide pension scheme with access to investment opportunities in international markets, 41 per cent agreed, 17 per cent were undecided, 4 per cent disagreed, and 3 per cent strongly disagreed that foreign bonds provide pension schemes with access to international market opportunities. The mean was 4.0339, and the standard deviation was 0.97781, reflecting a strong consensus on the strategic benefits of international diversification. The study findings are in tandem with those of Olaleye (2017) which revealed that foreign bonds allow pension schemes to access international markets and diversify their portfolios beyond the local economy. This global exposure can lead to better financial performance, supporting the claim that foreign bonds are a valuable tool for pension schemes seeking international market access.

Furthermore, 36 per cent of the respondents strongly agreed that investing in treasury bonds offers different maturities, ranging from short-term to long-term which provides steady cash flow for the pension fund, 42 per cent agreed, 13 per cent were undecided, 6 per cent disagreed, and 3 per cent strongly disagreed that they offer different maturities, providing steady cash flows for pension funds. The mean was 4.0085, with a standard deviation of 0.95627, indicating widespread support for the role of treasury bonds in liquidity management. Furthermore, 35 per cent of the respondents strongly agreed that treasury bonds allow pension schemes to align their investment strategy with their specific cash flow needs, 41 per cent agreed, 17 per cent were undecided, 6 per cent disagreed, and 2 per cent strongly disagreed that treasury bonds allow pension schemes to align their investment strategy with specific cash flow needs. The mean was 3.9576, with a standard deviation of 0.98184, reflecting moderate agreement on the strategic alignment benefits of treasury bonds. The study findings also agree with the findings of Asmare and Worku (2018) which indicated that Eurobonds offer geographical diversification by providing access to European markets, which can enhance the financial performance of pension schemes through exposure to different economic cycles and opportunities. This aligns with the statement that Eurobonds help pension schemes diversify geographically.

The study also indicated that 31 per cent of the respondents strongly agreed that through infrastructure bonds pension schemes contribute to the country's growth while benefiting from stable returns, 44 per cent agreed, 15 per cent were undecided, 7 per cent disagreed, and 3 per cent strongly disagreed that these bonds enable pension schemes to contribute to the country's growth while benefiting from stable returns. The mean was 3.9322, with a standard deviation of 0.95835, showing a favorable view towards infrastructure bonds as both financially rewarding and socially impactful investments. Moreover, 30 per cent of the respondents strongly agreed that investing in Eurobonds allows pension schemes to diversify geographically and access opportunities in European markets, 42 per cent agreed, 19 per cent were undecided, 7 per cent disagreed, and 2 per cent strongly disagreed that investing in Eurobonds allows pension schemes to diversify geographically and access opportunities in European markets. The mean was 3.8644, with a standard deviation of 1.00354, indicating a positive outlook towards Eurobonds for international diversification. Additionally, 29 per cent of the respondents strongly agreed that Eurobonds offer access to international markets without being directly exposed to fluctuations of euro thus reducing currency risk, 42 per cent agreed, 19 per cent were undecided, 7 per cent disagreed, and 3 per cent strongly disagreed that Eurobonds offer access to international markets without being directly exposed to euro fluctuations, thereby reducing currency risk. The mean was 3.8983, with a standard deviation of 0.85124, reflecting moderate agreement on the risk management benefits of Eurobonds. The study is in tandem with the findings of Wafula (2020) which emphasized that Eurobonds provide access to international markets while minimizing currency risk, especially since these bonds are usually issued in major currencies like the US dollar or euro, which are relatively stable. This supports the assertion that Eurobonds offer international market access with reduced exposure to currency fluctuations.

Percentage Investment Proportions of Various Types of Bonds

The study sought to determine the percentage investment proportions of various forms of bond investments held by private voluntary pension schemes in Kenya. This analysis aimed to understand how pension funds distribute their investments across different fixed-income securities to ensure stable returns, minimize risk, and maintain portfolio balance. The descriptive statistics summarized the investment levels in Treasury bonds, infrastructure bonds, corporate bonds, and foreign bonds, providing valuable insights into the bond investment preferences and strategies adopted by private voluntary pension schemes. The findings are indicated in Table 5.

Table 5: Percentage Investment Proportions of Various Types of Bonds

	N	Minimum	Maximum	Mean	Std.
Treasury Bonds	50	8.00	9.00	8.3000	.46291
Infrastructure Bonds	50	5.00	6.00	5.3000	.46291
Corporate Bonds	50	3.00	4.00	3.4600	.50346
Foreign Bonds	50	2.00	3.00	2.4600	.50346
Valid N (listwise)	50				

From the findings, the results indicated that among the bond investments held by private voluntary pension schemes, treasury bonds accounted for the highest investment proportion, with a mean of 8.30 and a standard deviation of 0.46. This implies that private voluntary pension schemes prefer treasury bonds because they are government-backed instruments that offer security, predictable returns, and low default risk. The low standard deviation further suggests minimal variation in investment levels across the private voluntary pension schemes, indicating a uniform preference for this category of bonds.

From the findings, it was further observed that infrastructure bonds had a mean of 5.30 and a standard deviation of 0.46, showing that private voluntary pension schemes also allocate a considerable portion of their bond investments to infrastructure projects. This investment preference may be attributed to the relatively higher yields of infrastructure bonds compared to treasury bonds, as well as their role in supporting long-term national development initiatives. The low variation in the standard deviation suggests that investment in infrastructure bonds is fairly consistent among the private voluntary pension schemes.

The findings further revealed that corporate bonds had a mean of 3.46 and a standard deviation of 0.50, indicating moderate investment in this asset category. This shows that while private voluntary pension schemes recognize the potential of corporate bonds to offer higher returns than government securities, they remain cautious due to the higher risk of default and the need for credit quality assessment of issuing corporations. The slightly higher variation among private voluntary pension schemes reflects differing risk appetites and investment policies.

From the findings, foreign bonds recorded the lowest investment proportion, with a mean of 2.46 and a standard deviation of 0.50. This suggests that private voluntary pension schemes have minimal exposure to foreign bonds, possibly due to exchange rate risks, foreign market uncertainties, and regulatory restrictions governing offshore investments. The moderate standard deviation implies slight differences in the extent of investment across the private voluntary pension schemes, reflecting varied levels of international diversification.

From these findings, it is evident that private voluntary pension schemes in Kenya demonstrate a strong preference for secure and predictable income-generating investments, as reflected in their high concentration in treasury and infrastructure bonds. The moderate investment in corporate bonds indicates a balanced approach between risk and return, while the limited allocation to foreign bonds highlights cautious international diversification. This overall investment behavior suggests that private voluntary pension schemes maintain a conservative bond portfolio designed to ensure capital preservation, steady income, and compliance with regulatory investment guidelines.

From the findings, the portfolio mix in bond investments can be approximated as 36% in treasury bonds, 30% in infrastructure bonds, 20% in corporate bonds, and 14% in foreign bonds. This distribution shows that the strategic optimal portfolio within bonds is heavily skewed toward government-backed securities, underscoring the importance of safety, liquidity, and stable returns in the investment strategies of private voluntary pension schemes. The observed pattern implies that the strategic optimal bond mix mediates the relationship between portfolio diversification and financial performance by emphasizing low-risk investments that enhance income stability and ensure long-term sustainability of pension fund returns.

Returns generated from various categories of bond diversification

The study aimed to assess the returns generated from various categories of bond diversification among private voluntary pension schemes in Kenya for the period 2020 to 2024. The results, as illustrated in Figure 2.

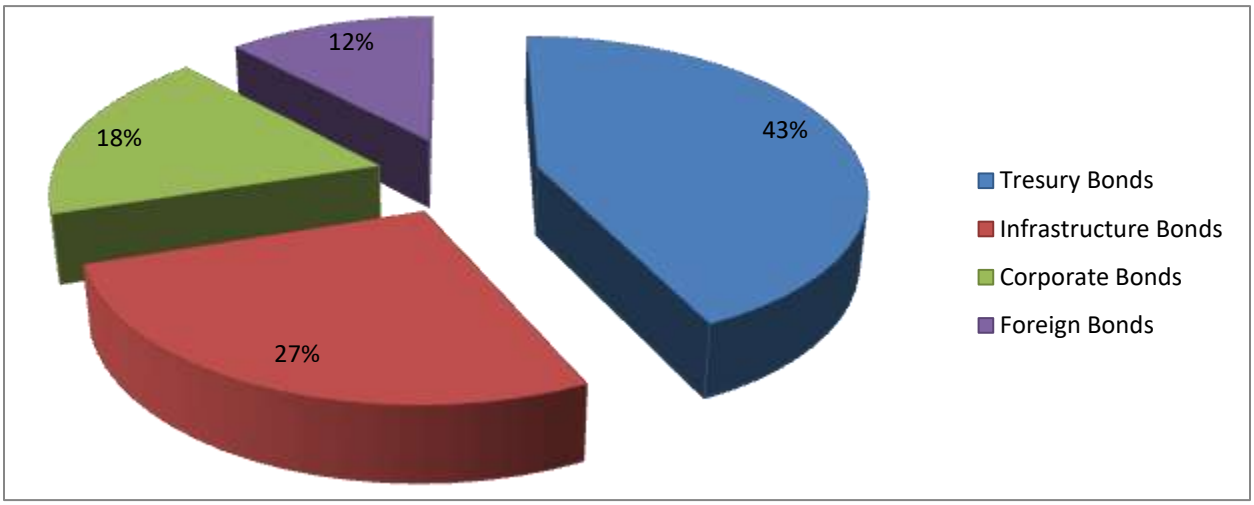

Figure 1: Returns generated from various categories of bond diversification

The findings revealed that Treasury Bonds accounted for the largest share of returns at 43 percent, followed by Infrastructure Bonds at 27 percent. Corporate Bonds contributed 18 percent, while Foreign Bonds generated 12 percent of the total returns. These results indicate that private voluntary pension schemes in Kenya show a strong preference for Treasury and Infrastructure Bonds, which are considered secure, stable, and government-backed investment options. The dominance of Treasury Bonds reflects a conservative investment approach aimed at minimizing default risk while ensuring predictable returns over time. Similarly, Infrastructure Bonds appear attractive due to their tax incentives, long-term maturity profiles, and alignment with national development priorities.

The moderate investment in Corporate Bonds suggests a cautious stance toward privately issued debt instruments, possibly due to concerns about credit risk, default probabilities, and limited secondary market activity. The relatively low returns from Foreign Bonds point to limited exposure to international debt markets, likely due to regulatory constraints, foreign exchange risks, and the preference for locally denominated investments. Overall, the results highlight that bond diversification plays a critical role in maintaining portfolio stability and providing consistent income streams for pension schemes.

The implications of these findings are that bond investments significantly enhance the financial performance of private voluntary pension schemes by ensuring steady and predictable cash flows while minimizing risk exposure. However, heavy concentration in Treasury and Infrastructure Bonds could limit portfolio growth potential due to lower yields compared to corporate or foreign alternatives. Pension fund managers should therefore consider diversifying within the bond portfolio by strategically increasing exposure to well-rated corporate and foreign bonds, which can enhance overall returns without compromising risk management principles.

Furthermore, the results underscore the importance of aligning investment strategies with the Retirement Benefits Authority (RBA) guidelines, which encourage prudent diversification to safeguard pension assets. A balanced mix of government, corporate, and foreign bonds would not only stabilize returns but also improve the strategic optimal portfolio mix, contributing to long-term financial sustainability. Effective bond diversification thus remains a key determinant of portfolio resilience and performance efficiency among private voluntary pension schemes in Kenya.

Returns on Investment in Bonds among Voluntary Pension Schemes

The study sought to determine the returns on investment in Bonds among voluntary pension schemes in Kenya from 2020 to 2024. The findings are presented in the table 6.

Table 6: Returns on Investment in Bonds among Voluntary Pension Schemes (2020–2024)

	Min	Max	Mean	Std.	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Bonds	4.00	8.00	5.9200	1.52709	.171	.913	-.360	2.000

From the findings, the returns on bond investments among voluntary pension schemes in Kenya from 2020 to 2024 ranged from 4.0% to 8.0%, with a mean return of 5.92%. This indicates that bonds provided moderate and relatively stable returns over the period. The standard deviation of 1.53 reflects low variability, highlighting bonds as a low-risk, predictable asset class that can stabilize pension portfolios. This observation aligns with Capital Asset Pricing Theory (CAPM), which emphasizes that fixed-income securities generally offer lower risk and consistent returns, making them suitable for risk-averse investors seeking to preserve capital while earning steady income (Sharpe, 1964).

The positive skewness of 0.171 suggests a slight tendency towards higher returns, though extreme outcomes are minimal. Similarly, the kurtosis of -0.360 indicates a platykurtic distribution, implying that extreme fluctuations in bond returns are rare. These findings are consistent with the Retirement Benefits Act (RBA) of Kenya, 1997, which advocates for pension schemes to include secure instruments like bonds to safeguard contributors' savings and maintain predictable growth.

Overall, the results imply that bonds are essential for portfolio stability within voluntary pension schemes, providing reliable returns that mitigate the risk associated with more volatile assets such as equities. Pension fund managers can leverage bonds to maintain a balanced portfolio, ensure regulatory compliance, and support sustainable long-term growth for scheme members.

Financial Performance of Private Voluntary Pension Schemes

The researcher further sought to assess the level of agreement with the statements on the influence of level of agreement with the statements on financial performance of private voluntary pension schemes in Kenya. The response was rated from 1-5 where indicated the lowest meanwhile 5 indicated the highest mean. Key SA=Strongly Agree, A=Agree, U=Undecided, D=Disagree, SD=Strongly Disagree. The study findings were as indicated in table 7.

Table 7: Financial Performance of Private Voluntary Pension Schemes

	SA (%)	A (%)	U (%)	D (%)	SD (%)	Mean	Std
Pension scheme has recorded higher returns on assets as for the past five years	14.4	51.7	21.2	9.3	3.4	3.6441	.95654
Pension scheme has diversified investment in different asset classes	17.8	54.2	24.6	2.5	1.0	3.8559	.76544
Return on investment has increased for the past five years.	11.0	32.2	37.3	11.9	7.6	3.2712	1.05944
Pension scheme has been able to mitigate the risks associated with investments	6.8	23.9	45.3	21.4	2.6	3.1111	.90761

From the findings 14.4 per cent of the respondents strongly agreed that pension scheme has recorded higher returns on assets as for the past five years, 51.7 per cent agreed, 21.2 per cent were neutral, 9.3 per cent disagreed while 3.4 per cent strongly disagreed that the scheme has recorded higher returns on assets over the past five years. The mean was 3.6441, with a standard deviation of 0.95654. The results suggest moderate satisfaction with the financial performance based on return on assets.

Furthermore 17.8 per cent of the respondents strongly agreed that pension scheme has diversified investment in different asset classes, 54.2 per cent agreed, 24.6 per cent were neutral, 2.5 per cent disagreed while 1 per cent strongly disagreed. The mean was 3.8559, with a standard deviation of 0.76544. The findings indicate a strong acknowledgment of the benefits of diversified investments. The study findings are in line with the findings of Doe (2019) study which highlighted how diversification across various asset classes such as equities, bonds, and real estate can positively impact the financial performance of pension schemes. By spreading investments, pension schemes reduce their exposure to any single asset class's volatility. This diversification is shown to help stabilize returns and improve overall portfolio performance. Doe's findings underscore the benefits of having a well-balanced portfolio that includes different types of assets to achieve a more resilient financial performance.

In addition, 11 per cent of the respondents strongly agreed that return on investment has increased for the past five years, 32.2 per cent agreed, 37.3 per cent were neutral, 11.9 per cent disagreed, while 7.6 per cent strongly disagreed. The mean was 3.2712, with a standard deviation of 1.05944, highlighting some uncertainty and mixed views on recent performance. Lastly 6.8 per cent of the respondents agreed that pension scheme has been

able to mitigate the risks associated with investments 23.9 per cent strongly agreed, 45.3 per cent were neutral, 21.4 per cent disagreed while 2.6 per cent strongly disagreed with a mean of 3.1111 and a standard deviation of 0.90761. The responses show that risk management remains a significant concern, with a large portion of respondents remaining undecided on its effectiveness. According to Cooley, Hubbard, and Walz, (2019) effective diversification is a key strategy for mitigating investment risks. Their study illustrates that diversification helps pension schemes avoid significant losses that might occur if the scheme were concentrated in a single asset class. By diversifying, pension funds can manage and spread risks, which helps in achieving more consistent performance and safeguarding against major financial shocks.

Annual Average ROI for Voluntary Pension Schemes (2018–2023)

The study sought to determine the financial performance of voluntary pension schemes over the period 2018 to 2023, with a focus on the annual average Return on Investment (ROI). The findings are indicated in Table 8

Table 8: Annual Average ROI for Voluntary Pension Schemes (2018–2023)

Year	Estimated Average ROI (%)
2019	6.5%
2020	7.0%
2021	11.6%
2022	8.0%
2023	6.6%

From the findings, the financial performance of voluntary pension schemes over the period 2019 to 2023 showed noticeable fluctuations. In 2019, the schemes achieved an average Return on Investment (ROI) of approximately 6.5%, indicating moderate growth in investment returns. The following year, 2020, saw a slight improvement, with an average ROI of 7.0%, reflecting continued positive performance despite potential market challenges. The peak performance occurred in 2021, when the schemes recorded an average ROI of 11.6%, demonstrating strong returns likely driven by favourable investment conditions and strategic portfolio allocation. However, in 2022, the ROI declined to 8.0%, signalling a reduction in returns possibly due to market adjustments or lower yields from certain asset classes. This downward trend continued into 2023, with an average ROI of 6.6%, highlighting challenges in maintaining consistent financial performance.

Diagnostic Tests

Normality tests

Table 9: Normality Assumption Test Results

Variable	Kolmogorov- Smirnov	Sig
Diversification in Bonds	.236	.091
Financial Performance	.234	.065

From the findings the p-values were greater than the significance level (0.05), this implies that the data were normally distributed. This is in line with Freeman (2017) who argue that when the sig value is less than the 0.05 thresh hold data is normally distributed.

Multicollinearity Test

Table 10: Multicollinearity Assumption Test Results

Variables	**Tolerance**	**VIF**
Diversification in Bonds	.889	1.125
Financial Performance	.543	1.842

From the finding the tolerance values for the seven variables under study were all above 0.10 and VIF values were less than 10, this implies that the data used had no Multicollinearity. This is in line with Fox, (2015) who argued that for the research to be accepted the Tolerance for all independent variables should be more than 0.1 and the variance inflation factor (VIF) is recommended to be below 10.

Heteroscedasticity

The study further sought to test for the presence of heteroscedasticity in the regression models using the Breusch–Pagan (BP) test. The test was necessary to establish whether the variance of the error terms was constant (homoscedastic) or varied with the independent variables (heteroscedastic).

Table 11: Breusch–Pagan (BP) test

	LM Statistic	df	p-value
Diversification in bonds	7.85	1	0.115
Mediating effect of strategic optimal portfolio mix	8.21	2	0.114

From the findings, the Breusch–Pagan (BP) test results revealed that all the regression models exhibited homoscedasticity. For the model assessing the model for diversification in bonds reported an LM statistic of 7.85 with a p-value of 0.115, which was also not statistically significant, indicating homoscedasticity.

Inferential Statistics

Under inferential statistics the study conducted both correlation and regression analysis. The findings are indicated below.

Correlation Analysis

Table 12 : Correlation Results

		Diversification in Bonds
Financial Performance	Pearson Correlation	.657**
	Sig. (2-tailed)	.000
	N	118

The results revealed there is a moderate positive correlation with financial performance, as indicated by a Pearson correlation of r=0.657 and a p-value of 0.000. This result implies that pension schemes with a more diversified bond portfolio tend to achieve higher financial performance, underlining the critical role of fixed-income securities in ensuring stability and returns. The study findings are in line with those of Shaaban, Ramadhan; Ndirangu, (2018) also noted that bond investment have a significant influence on financial performance of insurance firms listed in NSE.

Multiple Regression Analysis

Table 13: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.248	.159		1.560	.121
	Diversification in Bonds	.370	.188	.395	1.968	.047

a. Dependent Variable: Financial Performance of Private Voluntary Pension Schemes

The interpretations of the findings indicated follow the following regression model.

Y= 0.248+ 0.370 Diversification in Bonds

The regression analysis revealed that diversification in bonds has a positive and statistically significant effect on the financial performance of private voluntary pension schemes (PVPS) in Kenya. Specifically, holding all other variables constant, a unit increase in bond diversification is associated with a 0.370-unit improvement in financial performance. This finding reinforces the idea that fixed-income instruments, particularly government and corporate bonds, offer a stable and predictable return profile, making them an attractive component in pension fund portfolios. This result aligns with the study by Obong'o, Mutea, and Rintari (2020), which established a significant positive relationship between convertible bonds and liquidity growth in commercial banks operating in Nairobi County, Kenya. Their study emphasized that bonds contribute to financial performance by enhancing liquidity, providing periodic income, and cushioning against the volatility often experienced in equity markets. In the context of pension schemes, where predictable cash flows and long-term capital preservation are vital, such attributes are particularly desirable

CONCLUSION

The study concluded that there is a statistically significant and strong positive effect of diversification in bond investments and the financial performance of private voluntary pension schemes in Kenya. In addition, the study concluded that bond diversification acts as a stabilizing force within investment portfolios, providing consistent returns and cushioning the schemes against market volatility. Moreover, the study concluded that strategic optimal portfolio mix significantly moderates the relationship between regulatory compliance and the financial performance of private voluntary pension schemes in Kenya. However, the study was limited by its focus on only 50 private voluntary pension schemes, which may restrict the generalizability of the findings to the entire pension sector. Additionally, the reliance on self-reported data from respondents may have introduced response bias.

RECOMMENDATIONS

In light of the findings, the study recommended that pension scheme managers and trustees prioritize the diversification of their bond portfolios. Retirement benefits authority to evaluate other bond investments such as Islamic bonds skunk bonds, euro bonds and foreign bonds to reduce exposure to systematic risk. Furthermore, pension schemes should take deliberate steps to invest in the continuous professional development of their finance officers.

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