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Asset Class Selection and Financial Performance of Registered Umbrella Retirement Benefits Schemes in Kenya

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Abstract

Purpose: The financial performance of pension funds has deteriorated over time, threatening their main purpose of shielding retirees from old age poverty. Asset class selection is an essential component of pension management as it outlines the various investments undertaken to give a return, manage risks and maintain the liquidity of the retirement schemes. Uninformed or inappropriate selection of assets may lead to decreased performance of the pension schemes and a consequential decrease in the fund value of the pension savings. This study aimed to ascertain how asset class choice affects the financial performance of Kenyan registered Umbrella Retirement Benefits Schemes (URBS). The main goals of this study were to determine how allocating equity, fixed income, and alternative investments impacts the financial performance of registered URBS in Kenya. Three main research questions were employed in the study.

Methodology: This research targeted thirty-two (32) registered Umbrella Retirement Benefits Schemes as of December 2022. The sampling technique in this study was a complete census because the data was available; the researcher sought to reduce errors and give an overall view of the asset allocation and how the Kenyan Umbrella Schemes performed over the five years. The study utilised secondary data which was obtained from the RBA's website and offices for the five-year period between 2018 and 2022. A quantitative approach using descriptive and inferential analysis was employed. A multiple linear regression model was fitted on the data using SPSS version 27 and STATA version 14.2 for panel data analysis. Tables, charts, and graphs were also used to display the data.

Findings: According to the multiple linear regression model's findings, alternative investments highly influenced the financial performance of the URBS, followed by fixed income and equity investments. Real estate contributed the highest returns in alternative investments, followed by offshore investments. For fixed income, treasury bonds and bills contributed the most considerable returns, followed by cash, bank deposits, and corporate and commercial bonds. For the equity investments, quoted equity contributed the most returns, followed by the unquoted equity. It was noted that the allocation of private equity by umbrella schemes was almost non-existent as it only

began in 2022. Panel data analysis showed that all the weighted returns of the three asset classes are significant predictors of total weighted return. Weighted returns of offshore investment and property had the most significant associations with total weighted returns among all semi-variables.

Unique Contribution to Theory, Policy and Practice: The results support increased weighting of alternative investments, particularly offshore investments, followed by fixed-income investments.

Key Words: *Equity Investments Allocation, Fixed-Income Investments Allocation, Alternative Investments Allocation, and Financial Performance*

Background of the Study

Pension schemes are contractual arrangements that are made between an individual or an institution and a fund management or investment firm with the aim of saving for retirement. Pension schemes performance has however gradually reduced thereby threatening the sustainability of retirees, loss of investment assets and failure to meet their long-term objective. A survey conducted by Zamara Actuaries, Administrators & Consultants Ltd in 2023 on 423 pension schemes in Kenya reveals that the average return of pension investments was (0.20%) for the quarter ending 30th June 2023 (ZCASS, 2023). The same report shows that the yearly return was 7.65% and the three-year return was 7.8% for same period end (ZCASS, 2023). The above publication therefore means that the returns are way below the quarter two (Q2, 2023) inflation rate of 2.2%, yearly average inflation of 7.88%- and three-years' inflation rate of 6.8% for the same period (ZCASS, 2023). Having low investment returns of the pension funds is not ideal as that would eat away the investment amount and it would translate to the retirees having less than their invested amount at retirement and this may further impact on their livelihood and by extension the country's Gross Domestic Product (GDP) of Kenya. Understanding what impacts the financial performance of the pension industry is essential to assess the pressing issues and develop solutions that will lead to long-term sustainability. Questions regarding the sustainability of retirement savings in Kenya led to the enactment of NSSF Act number 45 of 2013 in February, 2023 (NSSF,2023). This Act requires members to raise their NSSF contributions from two hundred Kenyan Shillings (200) each month to 12% of their earnings, which should be contributed equally between the employer and the employee. Further, those earning above eighteen thousand (18,000) Kenyan Shillings are allowed to channel their extra contributions (Tier-11 funds) to a private pension management company (NSSF, 2023). The new changes have led to more involvement and vested interest from key pension stakeholders in Kenya's performance and management of retirement schemes. Assets invested should give adequate cash flows at retirement while also ensuring that there is capital preservation and appreciation.

There are five types of pension schemes registered in Kenya: Defined Contribution and Defined Benefit Schemes, National Social Security Fund (NSSF), Provident and Pension Funds, Umbrella Retirement Benefits Schemes, Occupation and Individual Schemes as displayed on the RBA website (2023). Umbrella Retirement Benefits Schemes were the primary subject of this study. Umbrella Retirement Benefits Schemes are pension plans that are composed of pooled funds from various employers to give their employees an excellent financial shield on retirement. Members of Umbrella schemes are businesses or companies that may lack the manpower, financial muscle, and expertise to run a fully-fledged pension scheme. The umbrella schemes are governed by a board of trustees with the fiduciary duty of acting in the members' best interest. Unlike other pension schemes, Umbrella Retirement Benefits Schemes allow the members to have bargaining power regarding administrative and management costs due to economies of scale. Further, pooling funds together gives the umbrella funds the liberty of many investment options that may fetch high returns for the members, thereby maximizing the retirement contributions' worth. The cumulative return on all the different asset classes within each pension scheme makes up the total return of the pension fund. A limited number of studies have been carried out recently to investigate the correlation between the asset class selection and the financial performance of the Umbrella retirement benefits programme. Additionally, there hasn't been much research done on how asset classes affect the success of pension plans, especially since the COVID-19 epidemic in 2020. The correlation between Kenyan registered Umbrella Retirement Benefits Schemes' financial success and the choice of asset classes is examined in this thesis. The study offers suggestions and potential solutions that investors can implement to optimise the pension fund returns while balancing the risks inherent in each asset class.

Statement of the Problem

Pension funds are organizations set up to receive financial contributions from employers, employees, or both to ensure capital preservation and appreciation, and the funds are paid out to the employees on retirement either as a lump sum or in instalments. The pension industry’s main objective is to ensure wealth sustainability, supports the capital market, and prevents old-age poverty. However, this important goal is being challenged by the consistent low performance evidenced by the pension industry in Kenya. Research done by Actuarial Services East Africa (Actserv, 2022) shows that Kenya's weighted average returns of pension funds stood at 1.7% in 2022, way below the average inflation level of 7.64%. The poor performance was attributed to the negative performance in equity, which averaged -14% (Actserve, 2022). Zamara Group studied the pension returns across 423 schemes, including the umbrella benefits schemes, and presented a report revealing that the average yearly returns were 2.4% compared to 12.4% in 2021 against an average inflation level of 9.1% for the period ending December 2022 (ZCASS,2023). Further, the Kenyan economy has been on a downward trajectory, with rising inflation currently at 8.52% as of August 2023, as shown by the Central Bank of Kenya (CBK,2023). The rising inflation level may eat away at investment returns, raising anxiety regarding managing retirement funds. The

investment market indices have also underperformed, with the Nairobi Securities Exchange All-Share Index (NASI) leading the pack. All listed equities on the NSE are included in the market capitalization-weighted index known as NASI. Investors utilise indices as a framework for assessing the effectiveness of fund managers in the present market. For instance, the fund manager is thought to be performing better than the market if NSE 25 posted a performance of 2% and the fund manager posted 2.2 %. NASI's performance averaged (5.1%) in Quarter 2 of 2023, one-year was (14.0%), three years was (8.1%) and five-year performance (9.3%) for the period ending June 2023 (ZCASS, 2023). The indices have, therefore, been a perfect indicator of how the market is performing, further affirming the need to study the phenomenon between asset allocation and pension fund performance. If the current performance trend is not fully addressed, there is a risk that pensioners may get less money than the invested funds. There is a need to ensure that the assets invested can give the much-needed cash flows at retirement while striving for capital preservation and appreciation.

Research has been done on asset allocation and how it affects pension plans' financial performance. On the other hand, little study has been done on asset class selection and how it affects Kenyan umbrella retirement benefit schemes' financial success. The impact of choosing an asset class among fixed income, equity, and alternative assets—all of which the RBA permits—on the umbrella schemes' financial success has not received much attention in research. Conflicting information about how asset class selection affects pension plans' financial success may also be found in published research. While investigating the effect of fund features on the financial performance of pension plans in Kenya, Wambui (2021) noticed the inadequate financial performance of Kenyan pension funds. She also confirmed that portfolio mix, fund size, liquidity, and operating costs account for 33 percent of pension fund returns. Auma (2013) investigated the connection between portfolio holding and Kenyan insurance companies' financial results. Auma found a robust and favourable correlation between the financial success of insurance businesses and the asset classes in their portfolios. In particular, the study revealed an inverse relationship between equity investments, bank deposits and profitability (Auma, 2013). However, real estate and government securities were positively correlated to the insurance industry's financial performance (Auma, 2013). There is disagreement between Auma's findings and those of Njeru (2014), who conducted an evaluation of the financial performance of pension funds' holdings in Kenya. Njeru (2014) discovered that for the first three years, stocks performed better than other asset classes, but the performance was poor for the first three months. Mariana Mwachanya (2015) conducted research on how asset allocation affected Kenyan pension funds' financial results. According to this analysis, asset allocations account for 28% of the variation in pension fund results. Other conditions, such as asset class timing, security and manager selection, accounted for 72% of the fund returns. Mwanchanya posits that after considering the assets allowable by the Retirement Benefits Authority (RBA), equity was more important than fixed deposits in establishing the returns of a portfolio. This study confirms the findings of Shukrani, Ifire, Yeya,

and Banafa's (2022) investigation on the effect of investment portfolio selection on the financial performance of investment companies listed on Kenya's Nairobi Securities Exchange (NSE). The study found a strong and positive correlation between bond, stock, and real estate investments with financial performance.

Research Objectives

i To evaluate the influence of equity investments allocation on the financial performance of Registered URBS in Kenya.
ii To explore the influence of fixed income investments allocation on the financial performance of Registered URBS in Kenya.
iii To investigate the influence of alternative investments allocation on the financial performance of Registered URBS in Kenya.

Literature Review

Theoretical Review

Capital Asset Pricing Model-Equity Investments

Wilfred Forsyth Sharpe, John Lintner, and Jan Mossin established the capital market pricing theory in the 1960s (Dhankar, 2019). The theory attempts to explain the relationship between expected returns for assets and systematic risks (beta) in the market (Berns, 2020). Systematic risks are those risks that arise from the market such as inflation, recession and change of government and may not be diversifiable (Abrahams, 2020). Capital Market Pricing Theory (CAPM) looks at how firms price certain risky securities like equity to enable them to get the expected returns (Dhankar, 2019). The risk free rate (Abrahams, 2020) represents the time it takes for a portfolio to achieve the projected returns for the client. The minimal rate of return that an investor can expect from a risky investment must be the same as the risk-free rate of return (McCarthy and Miles, 2013). CAPM also uses a standard holding period of portfolio like six months or one year before making assumptions on the performance of the portfolio and compares returns across different securities (Dhankar, 2019). The beta within the formula explains the volatility of the asset in the market and when it surpasses 1, it is considered to be highly risky (Abrahams, 2020) while a beta of below 1 is fairly risky and considered ideal. CAPM is applicable in this research as it elaborates on how equity investments affects the performance of pension funds. CAPM can assist in estimating the expected return of a pension fund's equity portfolio based on its systematic risk (beta) relative to the general market. Pension fund managers can determine if the equity element of the portfolio is likely to contribute positively to overall fund performance by assessing the expected return on equity. The CAPM measures the systematic risk of an asset or portfolio, which can be useful in evaluating the risk associated with an equity allocation (McCarthy and Miles, 2013). A higher beta implies higher sensitivity to market movements, and pension fund managers can use this information to assess how the allocation to equities affects the overall risk profile of the fund.

CAPM aids in asset allocation decisions in that pension fund managers often allocate a portion of their assets to equities to potentially generate higher returns. CAPM can help in comparing the expected returns and risk-adjusted returns of equities with other asset classes in the portfolio, such as fixed income or alternative investments. CAPM can help estimate the cost of equity capital for the fund thereby helping decision-makers evaluate whether the expected returns from equities are sufficient to meet those objectives and justify the associated risks. Most importantly, using CAPM can enable pension fund managers to conduct stress tests to understand how changes in equity allocation would impact the fund's expected return and risk. Abrahams (2020) affirms that this analysis can help identify scenarios where the equity allocation might perform well or poorly. When evaluating the performance of a pension fund, it's important to consider not only the absolute return but also the risk-adjusted return. The CAPM provides a framework for assessing whether the fund is earning an appropriate return given its level of systematic risk. If the actual return of the pension fund exceeds what the CAPM predicts based on its risk exposure (as measured by beta), it may indicate skilled management or superior asset allocation.

Modern Portfolio Theory

Harry Markowitz developed the Modern Portfolio Theory (MPT) in 1952 which emphasizes on the importance of diversification in constructing portfolios (Elton, Gruber, Brown & Goetzmann, 2017). According to MPT, investors can develop an efficient frontier of portfolios that offer the highest projected return for an identified risk level or the minimum risk for a defined level of return by combining assets with diverse risk and return characteristics (Lukomnik & Hawley, 2021). Further, the theory states that a portfolio's risk and return profile is better than individual investment's risk and return (Lukomnik & Hawley, 2021). Understanding the risk return tradeoff for a portfolio can enable institutional and individual investors to select appropriate assets for the portfolio (Elton et al., 2017). The rationale behind selecting this theory for the study is its broad applicability, as it is employed by investors to guide their decisions. It presents various concepts such as risk-return trade-offs, efficient market frontiers, portfolio rebalancing, quantitative approaches based on historical returns, and long-term focus. When examining how asset allocation and fixed income investments affect pension fund performance, modern portfolio theory (MPT) is a valuable tool (Berns, 2020). According to Elton et al. (2017), MPT highlights the significance of asset allocation as the main factor influencing portfolio performance. Pension fund managers can use MPT to gain a better understanding of the optimal mix of fixed income assets, stocks, real estate, and other asset classes to meet the fund's objectives while minimising risk (Berns, 2020). MPT calculates the value of the portfolio as well as the risk and return of each individual asset. Although they offer lower returns than equities or alternative investments, investments like fixed income investments are less risky (Elton et al., 2017). MPT helps pension fund managers assess how different allocations to fixed income affect the overall portfolio's expected return and risk. MPT advocates diversifying investments to spread risk by holding a mix of fixed income securities with different maturities, credit qualities, and interest rate sensitivities. Diversification helps

mitigate the impact of poor performance in any single fixed income asset or sector. MPT relies on correlations between asset classes to estimate portfolio risk. Pension fund managers can use historical data and statistical analysis to understand how fixed income investments correlate with other assets in the portfolio, such as equities. By selecting assets with low correlations, they can achieve better risk reduction through diversification. Modern Portfolio Theory is highly applicable when studying the impact of fixed income investments and asset allocation on pension fund performance. It provides a rigorous framework for decision-making that aims to optimize returns while managing risk, which is essential for long-term investors like pension funds.

Behavioral Finance Theory

Behavioral Finance Theory was developed by Daniel Kahneman, Amos Tversky, Richard Thaler, Robert Shiller, and others in the 1970s to 1980s (Baker & Ricciardi, 2014). Behavioral finance incorporates psychological and cognitive factors into financial decision-making. It suggests that investors are not always rational and may exhibit biases that affect their asset allocation decisions (Baker & Ricciardi, 2014). There is a likelihood that pension trustees are influenced by the current performance of assets such as real estate and stock and desire to invest there. Fund manager therefore has to well understand the risk and return aspect of such asset allocation while also considering future cash flow needs. Copur 2(015) notes that prospect theory, loss aversion, and herding behavior are examples of biases that can lead to suboptimal asset allocation decisions. Understanding these biases helps investors mitigate their impact on portfolio returns. Behavioral finance theory is highly applicable when studying the influence of asset class selection on the financial performance of pension funds as it recognizes that human emotions and cognitive biases can significantly influence investment decisions and, consequently, portfolio performance. Behavioral finance theory remains highly applicable when studying the impact of alternative investments' asset allocation on pension fund performance. According to (Caselli & Negri, 2018) alternative investments, such as private equity, offshore investments and real estate present unique challenges and opportunities for pension funds, and behavioral biases can influence decision-making. This theory notes the prevalence herding behavior in the alternative investments space in that investors and pension fund managers may follow their peers without having thorough analysis and this could lead to poor decision making (Waldemar & Nermend, 2019). Behavioral biases can lead pension fund managers to be overly confident in their ability to pick successful alternative investments or timing their entry and exit from these assets. Overconfidence can result in excessive allocation to riskier alternatives or mistimed investments (Waldemar & Nermend, 2019). It is also possible for managers to be reluctant to exit underperforming alternative investments, even if it's rational to do so, due to the disposition effect. This bias can lead to a suboptimal allocation of resources as funds are tied up in underperforming assets. Behavioral Finance Theory best explains the concept of risk aversion in that pension fund managers may avoid making unconventional or contrarian allocations to alternative investments out of fear of regret if these choices underperform. This aversion to regret can lead to a lack of diversification and suboptimal portfolio construction.

Platanakis, Sakkas and Sutcliffe (2019) notes that the way alternative investments are presented or marketed can impact allocation decisions. Notably, Behavioral Finance Theory suggests that managers may react differently to the same investment opportunity if it is framed positively or negatively. Understanding the inherent boas in the pension fund management can enable the investors to implement alternative asset allocation strategies that will counteract them and lead to rational asset allocation.

Conceptual Framework

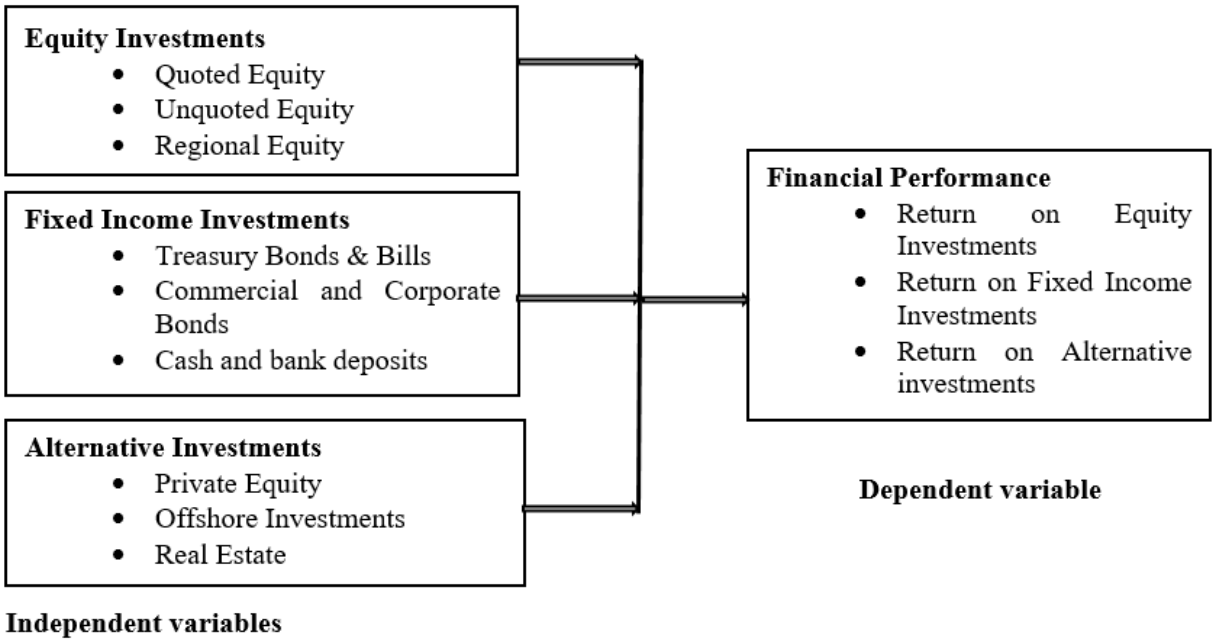

Figure 1: Conceptual Framework

Research Methodology

The study utilized a descriptive research design. The target population was all the 32 registered umbrella benefits retirement schemes from all the 1028 registered pension schemes in Kenya as of December 2022. The study used a census of all the firms. This study used secondary data through quarterly and yearly statistical digest publications on the RBA website for the period between 2018 to 2022. The study was analyzed using SPSS version 27 and Stata version 14.2 and the data is presented in form of pie charts, tables, and figures. Multiple linear regression model was chosen to study the three main variables of the Umbrella Retirement Benefits Schemes. Panel data fixed effects regression analysis was utilized to study the sub variables on the Umbrella schemes and three other schemes namely NSSF, Occupational and provident schemes. The three extra schemes were selected to get a more comprehensive view of the industry. The multiple linear regression model is as shown below:

$$Y=\alpha+ \beta1X1 + \beta2X2 + \beta3X3 + \varepsilon$$

Where: Y=Financial performance as measured by ROI, α= slope, β= Regression coefficient, X1= Weighted Return of Fixed Income Investments, X2= Weighted Return of Equity Investments, X3= Weighted Return of Alternative Investments, ε= error term

Fixed Effects Regression

Stock and Watson (2015) assert that the random effects model assumes that the entity's (in this case the scheme) error term is uncorrelated to the predictors. That allows the variables that do not change over time to play the role of explanatory variables (Stock & Watson, 2015). Results from the random effects regression model allows one to make inferences concerning the entire population based on the study sample. Panel data analysis for the current study was done using the xtreg command in STATA with total weighted returns as the dependent variable. A robust term was added at the end of the xtreg command to control for hetroskedasticity while the term 'fe' was included to specify that the model is a fixed effects one.

$$Yit = \alpha i + \beta Xit + ui + eit$$

Where: t= time, i= entity, Yit =Financial performance as measured by total returns, αi = slope for each entity, β= Regression coefficient, Xit=vector of predictors, ui and eit = error terms within the entity and overall error term respectively.

The independent variables are listed below: X1= Weighted Return of quoted equity, X2= Weighted Return of unquoted equity, X3= Weighted Return of treasury bonds and bills, X4= Weighted Return of commercial and corporate bonds, X5= Weighted Return of cash and bank deposits, X6= Weighted Return of offshore investments and X7= Weighted Return of fixed property and REITs

Findings of the Study

Final Data Set

Table 1 presents the dataset used to carry out the regression analysis. The data covers five years, from 2018 to 2022. The weighted average returns is the dependent variable used in the regression analysis. The independent variables are the weighted returns of the three asset classes of fixed income, alternative investments, and equity investments.

Multiple Linear Regression Data Set

Table 1: Final Data Set for multiple linear regression model

Year	Total Weighted returns	Equity weighted Returns	Fixed income weighted Returns	Alternative Investments weighted Returns
2018	0.0151	0.0098	0.0052	0.0000
2019	0.0256	0.0194	0.0062	0.0000
2020	0.0721	0.0054	0.0664	0.0003
2021	0.0704	0.0100	0.0601	0.0003
2022	0.1076	0.0112	0.0967	-0.0002

Fixed Effects Regression Data Set

Table 2: Final Data Set for the First Fixed Effects Regression Model

Entity	Year	Weighted return (Wr)	Wr Equity Investments	Wr Fixed income investments	Wr Alternative investments	Quoted Equity return
Umbrella	2022	10.7598	1.1154	9.6651	-0.0207	1.1154
Umbrella	2021	7.0433	0.9960	6.0131	0.0341	0.8688
Umbrella	2020	7.2073	0.5435	6.6381	0.0257	0.5414
Nssf	2022	9.8290	1.3940	7.8160	0.6200	1.3920
Nssf	2021	7.8390	0.4710	6.8110	0.5570	0.4670
Nssf	2020	8.8880	0.5410	7.8360	0.5100	0.5420
Occupational	2022	7.9750	1.0020	6.5630	0.4090	0.9960
Occupational	2021	7.6250	0.6730	6.1010	0.8510	0.6460

Occupational	2020	7.7740	0.7220	6.5400	0.5120	0.6980
Provident	2022	8.5700	1.1600	7.0310	0.3780	1.1570
Provident	2021	8.1640	0.5350	6.6720	0.9570	0.5200
Provident	2020	8.5050	0.6040	7.5380	0.3630	0.5930

Table 3: Final Data Set for the First Fixed Effects Regression Model Continued

Unquoted equity returns	Treasury Bonds and Bills returns	Commercial Corporate bonds returns	Cash and bank deposits returns	Offshore investment returns	Property and reits returns
0.0000	8.6116	0.1091	0.9444	-0.0588	0.0382
0.1272	5.4935	0.0270	0.4926	0.0098	0.0243
0.0021	5.6487	0.4398	0.5496	0.0257	0.0000
0.0110	7.2310	0.0780	0.4930	0.0000	0.6190
0.0030	6.3950	0.0450	0.3710	0.0000	0.5570
0.0050	6.9310	0.0770	0.9180	0.0000	0.4830
0.0400	6.0330	0.0510	0.4380	0.0270	0.3730
0.0270	5.6530	0.0480	0.4000	0.0560	0.7940
0.0300	5.9430	0.0650	0.5880	0.0160	0.4810
0.0160	6.4880	0.0650	0.4610	0.0170	0.3590
0.0140	6.1890	0.0470	0.4350	0.0470	0.9100
0.0000	6.7360	0.0780	0.7990	0.0120	0.3330

Correlational Analysis of Variables

Correlation is a measure of the association between variables (Stock and Watson, 2015). Correlational analysis helps one to establish three things about the association of given variables namely the direction, strength, and significance of the association (Stock and Watson, 2015). In terms of significance, correlation can be either negative or positive. Negative correlation means that the lower values of one variable are associated with the higher values of another variable (Stock and Watson, 2015). On the other hand, positive correlation means that the higher values of one variable are associated with the higher values of another variable (Stock and Watson, 2015). The strength of the relationship is judged by looking at the correlation coefficient. Weak relationships are indicated by a correlation coefficient between 0.10 and 0.29. Moderate relationships are indicated by a correlation coefficient between 0.30 and 0.49 while strong relationships are marked by coefficients equal to or greater than 0.50 (Stock and Watson, 2015). The ranges apply regardless of whether the coefficients are positive or negative. The table 4 below shows the SPSS output of the correlational analysis. The table shows that alternative investments are strongly and positively correlation with the weighted returns at 0.994. A subsequent increase in the allocation of alternative investments will lead to an increase in the weighted returns by 0.994%. The correlations with fixed income and equity investments are -0.62 and -0.392 respectively meaning that an extra allocation in those asset classes with reduce the weighted returns by the stated proportions of -0.62% and -0.392%. The result indicates that among the independent variables it is alternative investment that has had the strongest relationship with the dependent variable for the period of study.

Table Error! No text of specified style in document.**: Correlations Table**

Correlations

		WeightedTotalReturns	FixedIncInv	EquityInv	AlterInvInv
WeightedTotalReturns	Pearson Correlation	--			
	N	5			
FixedIncInv	Pearson Correlation	-.062	--		
	Sig. (2-tailed)	.921			
	N	5	5		
EquityInv	Pearson Correlation	-.392	-.471	--	
	Sig. (2-tailed)	.514	.424		
	N	5	5	5	
AlterInvInv	Pearson Correlation	.994	-.005	-.494	--
	Sig. (2-tailed)	<.001	.994	.398	
	N	5	5	5	5

Descriptive Analysis

Figure 2 shows the average weighted returns of the three asset classes. Fixed income investment was the asset class with the largest weighted returns (an average weighted return of 4.69% which

accounted for over 80% of all total returns), followed by equity investment and alternative investment with 1.116% and 0.008% average weighted returns respectively. This shows that among the three asset classes fixed income is responsible for most of the returns by umbrella schemes..

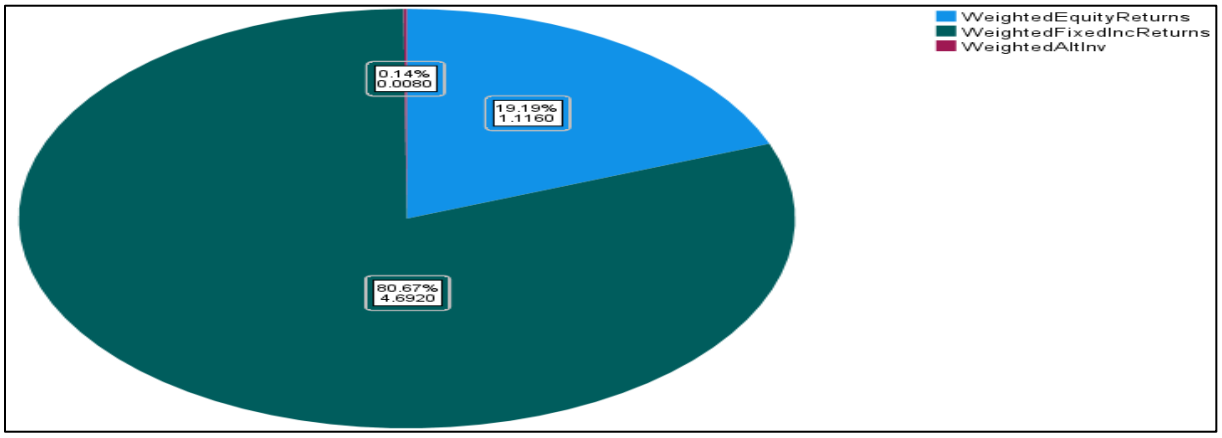

Figure 2: Pie Chart of Average weighted returns for the three asset classes over the study period

In regard to equity returns, figure 3 shows that for the study period weighted returns of quoted equities accounted for 96.44% of the weighted equity returns. Weighted returns from unquoted equity accounted for only 3.56% of the total returns from equity investments..

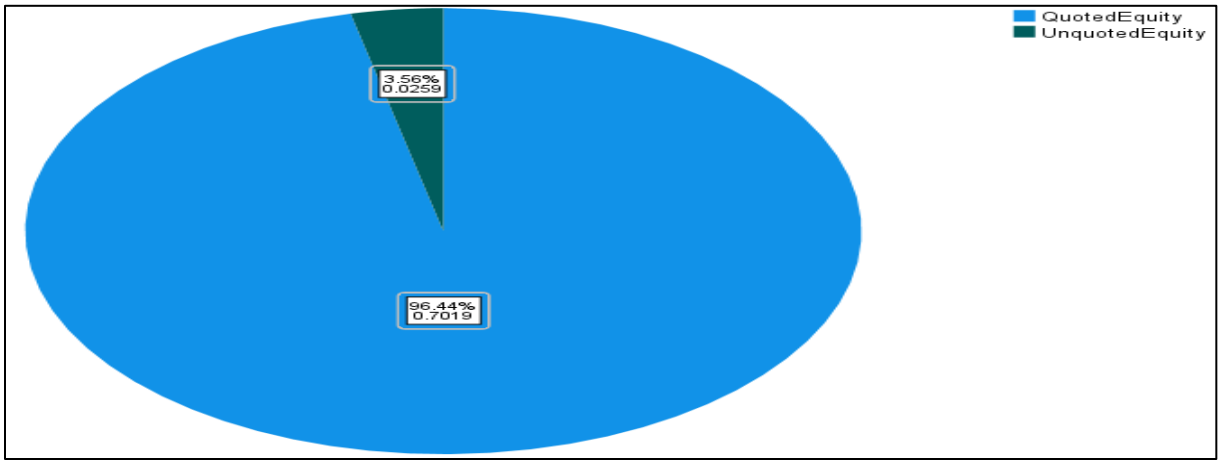

Figure 3: Weighted returns of equity investments

In terms of fixed income, treasury bonds and bills accounted for 88.52% of all the total weighted returns of the fixed income asset class. Cash and bank deposits and commercial and corporate bonds with weighted average returns of 3.973% and 0.1152% brought in the second and third highest weighted returns respectively (see figure 4)

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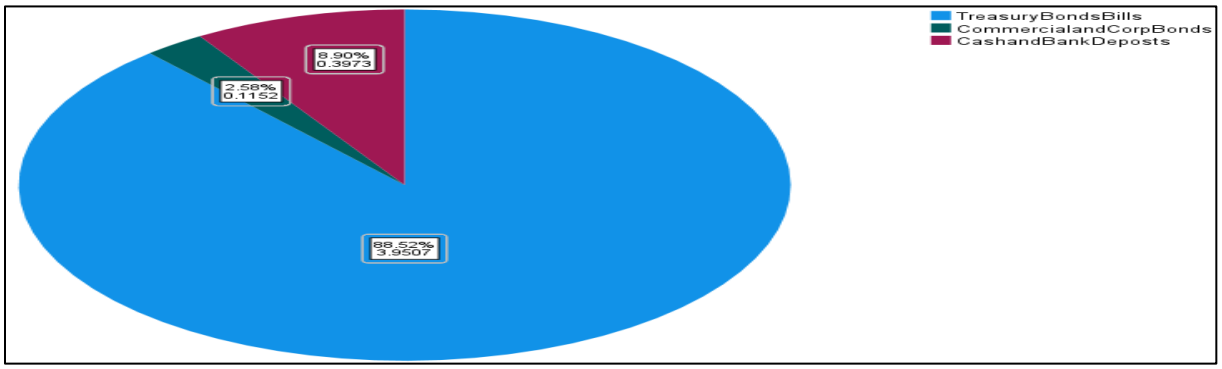

Figure 4: Weighted Returns of Fixed Investments

The weighted return of property and REITS accounted for the biggest proportion (over 85%) of weighted returns of alternatives investment asset class for umbrella schemes. It is worth noting that private equity investments which are part of the private equity investment class was not covered when analyzing the returns of the alternative investment class. The reason is because data showed that allocation of funds by umbrella investments into private equity was insignificant for the period.

The descriptive statistics in table 5 add more insight to the information shown by the figures shown so far in this section. Fixed income has the highest weighted returns (7.1%) among the three asset classes while treasury bills and bonds (6.44%) is the semi variable with the largest average weighted return.

Table 5: Descriptive Statistics of Different Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
wr	12	8.348283	1.072948	7.0433	10.7598
wrequityinv	12	.813075	.3061565	.471	1.394
wrfixdinv	12	7.102025	1.004174	6.0131	9.6651
wralinvest	12	.4330083	.3091299	-.0207	.957
quotedequi~n	12	.7947167	.3044967	.467	1.392
unquotedeq~s	12	.0229417	.0352967	0	.1272
treasurybo~s	12	6.446067	.8681829	5.4935	8.6116
commercial~s	12	.0941583	.1109268	.027	.4398
cashandban~s	12	.5741333	.2005008	.371	.9444
offshorein~s	12	.0126417	.0286978	-.0588	.056
propertyan~s	12	.4142917	.2919984	0	.91

Multiple Linear Regression

A regression analysis run to analyze the effect of the amount of investment put in the three asset classes of fixed income, equity investment and alternative investment gave the result posted in the tables 6 and 7. The significance of the predictors is judged using the hypothesis presented below. A p-value below 0.05 confirms that the predictor variable is a significant predictor of the dependent variable.

Table 6: Regression ANOVA Table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.006	3	.002	3917595.909	<.001[b]
	Residual	.000	1	.000		
	Total	.006	4			

The regression coefficients output is presented in table 6. A summary of the decisions regarding the significance of the three variables is presented in the three points below;

Weighted equity investment return is a significant predictor of weighted total returns since it has a p-value (0.002) of less than α=0.05

Weighted fixed income return is a significant predictor of weighted total returns since it has a p-value (0.001) of less than α=0.05

Weighted alternative investment return is a significant predictor of weighted total returns since it has a p-value (0.038) of less than α=0.05

Table 7: Regression Coefficients Table

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.00019	.000		4.050	.154
	Equity Investment	.991	.003	.134	335.270	.002
	Fixed Income	.998	.000	1.060	3004.836	<.001
	Alternative Investment	1.006	.061	.006	16.615	.038

Adding the regression coefficients in table 7 to the study model generates the model shown below.

Weighted total return = 0.00019 + 0.991 Weighted Equity Investment + 0.998 Fixed Income Investment + 1.006 Alternative Investment

The regression coefficients in table 7 and the regression model presented above indicate that alternative investment is the asset class that offers the most returns for every additional investment.

That is because an extra 1% of income generated by alternative investments is associated with a 1.006% increase in the return of the umbrella schemes. That is higher than the 0.991% and 0.998% that 1% increase in the returns of fixed income and alternative income respectively add to the total weighted returns.

Fixed Effects Regression

A fixed effects regression to examine the association between semi-variables of the three asset classes was run using the xtreg command. The terms fe and robust were added to specify that the model is a fixed effects one and to control for heteroscedasticity respectively. Interpretation of the p-values of the outputs is according to the two hypothesis below. P-values less than α=0.005 indicate that the predictor is significant.

H_0: The predictor variable is not a significant predictor of the dependent variable

H_1: The predictor variable is a significant predictor of the dependent variable

The results of the fixed effects regression are shown in table 8. As shown below, all the predictor variables had p-values below α=0.05, meaning that all of them are significant predictors of the dependednt variable.

x_1= Weighted Return of quoted equity (p-value= 0.00)

x_2= Weighted Return of unquoted equity (p-value= 0.027)

x_3= Weighted Return of treasury bonds and bills (p-value= 0.00)

x_4= Weighted Return of commercial and corporate bonds (p-value= 0.01)

x_5= Weighted Return of cash and bank deposits (p-value= 0.00)

x_6= Weighted Return of offshore investments (p-value= 0.01)

x_7= Weighted Return of fixed property and reits (p-value= 0.00)

Of all the seven variables, offshore investments is the semi variable that had the largest association with total weighted returns (see table 8). A 1% increase in the returns of offshore investments results in a 2.54% increase in total weighted returns. This result matches that of the multiple linear regression which showed that among the asset classes alternative investment gives the best returns for every percentage increase in its returns. The results mean that fund managers of umbrella schemes should place more investments into the alternative investment asset class, especially offshorinvestments.

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Table 8: Fixed effects regression; semi variables

```
> returns, fe robust

Fixed-effects (within) regression               Number of obs      =        12
Group variable: entity2                         Number of groups   =         4

R-sq:                                           Obs per group:
     within  = 1.0000                                         min =         3
     between = 0.9998                                         avg =       3.0
     overall = 1.0000                                         max =         3

                                                F(4,3)             =         .
corr(u_i, Xb)  = -0.1765                        Prob > F           =         .

                                              (Std. Err. adjusted for 4 clusters in entity2)
------------------------------------------------------------------------------
             wr |      Coef.   Robust Std. Err.      t    P>|t|     [95% Conf. Interval]
----------------+-------------------------------------------------------------
quotedequityreturn |    .960234   .0214416    44.78   0.000     .8919974    1.028471
unquotedequityreturns |   1.430208   .3513121     4.07   0.027      .312176     2.54824
treasurybondsandbillsre~s |   1.086999   .0205256    52.96   0.000     1.021677    1.152321
commercialcorporatebond~s |   1.030617   .0828176    12.44   0.001     .7670541    1.294179
cashandbankdepositsretu~s |   .7708281   .0262173    29.40   0.000      .687393    .8542632
offshoreinvestmentreturns |   2.541521   .1891409    13.44   0.001      1.93959    3.143451
propertyandreitsreturns |   .9023255   .0195995    46.04   0.000     .8399513    .9646997
              _cons |  -.4000647   .1125035    -3.56   0.038     -.758101   -.0420284
----------------+-------------------------------------------------------------
              sigma_u |  .00636956
              sigma_e |  .00781894
                  rho |  .39890322   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Discussion

The results and findings adequately addressed the specific objectives as highlighted below.

To evaluate the influence of equity investments allocation on the financial performance of Registered URBS in Kenya

Returns from equity investments accounted for just above a tenth of the returns by umbrella schemes in that five-year period from 2018 to 2023. Quoted equity contributed the most returns for the equity investment asset class with over 97% of the total weighted returns being attributed to unquoted equity. Regression analysis results showed that equity investment is the class that offers the lowest total return for every additional 1% increase in income is a significant predictor of weighted total returns; p-value of 0.001 that is less than α=0.05. An additional 1% of income generated by equity investments is associated with a 0.991% increase in the return of the umbrella schemes. Within the equity asset class quoted equity and unquoted equity were associated with a 0.9602% and 1.4302% respectively in the increase in weighted total returns for every 1% increase in the returns of each class. This shows that within the equity assets, unquoted equity should get more weighting from the umbrella fund managers. The study's conclusions sufficiently address the stated goal and are consistent with previous studies on the financial success of pension plans and the distribution of equity. Mwangi (2018) investigated how asset allocation affected Kenyan individual benefit pension schemes' financial results. The study found that individual programmes with investments in unquoted securities had better financial results. The same analysis found a

negative correlation between listed equity investments and the schemes' financial performance. Mella (2016) investigated how real estate investments affected Kenyan pension funds' financial results. According to the report, equity investments were deemed risky and significantly and negatively impacted Kenyan pension funds' financial performance. A study by Boyante, Muturi, and Gekara (2022) on the effect of Quoted Equity Investments on the Financial Performance of Pension Funds in Kenya is also supported by the research. The findings of the research demonstrated that pension fund performance was significantly impacted negatively by equities investments, suggesting that the asset class entailed a high degree of risk and that a larger risk premium was necessary to protect investors from both perceived and actual dangers. Nonetheless, the results differ from a research by Kioko and Ochieng (2020) regarding the impact of portfolio diversity on the financial outcomes of investment companies registered in the Nairobi Stock Exchange. Return on investments and equity investments have a strong and positive correlation, according to Kioko and Ochieng (2020).

To explore the influence of fixed income investments allocation on the financial performance of Registered URBS in Kenya

Fixed income accounted for over three quarters of the returns by umbrella schemes in the period from 2018 to 2023. The finding is expected since in the last few years, interest returns from government securities have been increasing, resulting in higher returns and higher asset allocations by fund managers. Also noted was the fact that fixed returns contributed the largest to the returns of the fixed income asset class. Regression results showed that fixed income is a significant predictor of weighted total returns; p-value of 0.001 that is less than α=0.05. An additional 1% of income generated by fixed income investments is associated with a 0.998% increase in the return of the umbrella schemes. Panel data analysis showed that within the fixed income asset class treasury bonds and bills, commercial and corporate bonds, and cash and bank deposits were associated with a 1.087%, 1.03%, and 0.77% respectively in the increase in weighted total returns for every 1% increase in the returns of each class. This shows that within the fixed income class treasury bonds and bills should get more weighting from the umbrella fund managers. The results of this analysis are consistent with a study conducted in 2019 by Chovancova, Hudcovsky, and Kotaskova on the effect of stocks and bonds on the performance of pension funds for members of the Organisation for Economic Co-operation and Development. The study found a significant correlation between pension fund performance and fixed income investments. The results also support Mwangi's (2018) study on the impact of asset allocation on the financial performance of Kenyan individual benefit pension plans. Mwangi noted that the financial performance of individual plans that invest in government, unquoted, and fixed interest securities is greater. Boyante (2013) studied the financial performance of Kenyan pension funds and the moderated analysis of asset allocation. The performance of pension funds and treasury bonds is positively and significantly correlated, according to the researcher. Research on the effect of investment portfolio selection on the financial performance of investment companies in Kenya was done by Kamwaro

(2013). The analysis shows that adding bonds improved investment companies' financial returns. An investigation on how asset allocation affects the financial performance of Kenyan pension plans was carried out by Ndung'u (2016). According to the study, there is a significant association between the financial performance of pension systems in Kenya and the distribution of assets towards fixed income and fixed deposits. Kenyan unit trust schemes' financial performance was examined by Mokaya, Chogi, and Nyamute (2020) in relation to asset allocation. Unit trust scheme funds' financial performance was shown to be significantly impacted by the proportion of money market instruments, corporate bonds, and treasury bonds, according to the researchers.

To investigate the influence of alternative investments allocation on the financial performance of Registered URBS in Kenya

Alternative investment is the asset class that contributed the least income to the total weighted returns among the three asset classes. In the alternative investment asset class, property contributed more than 84% of the returns while offshore investments contributed the rest. It was noted that allocation into private equity by umbrella schemes was almost non-existent. In fact, umbrella schemes did not allocate any funds into private equity in both 2020 and 2021. Hence, private equity returns were not included in the final dataset. Alternative income is the asset class with the highest potential to increase total weighted returns. The asset class is a significant predictor of total weighted returns; p-value (0.038) of less than α=0.05. A 1% increase in the returns of alternative investment is associated with a 1.006% increase in the total weighted returns; the highest impact on total weighted results among all asset classes. This result was supported by findings from the panel data fixed effects regression analysis. This is because the panel data analysis showed that weighted returns of offshore investment, a subset of alternative, had the largest association with total weighted returns among all semi variables: p-value (0.001) of less than α=0.05. A 1% increase in the returns of offshore investments results in a 2.54% increase in total weighted returns. This result shows that fund managers of umbrella schemes should pay more attention to offshore investment opportunities. The findings on alternative investments concur with previous studies done on how the financial performance of pension schemes is impacted by alternative investments. In 2019, Wanjohi and Kariuki conducted research on the connection between fund performance and asset allocation in Kenyan occupational pension systems. The academics observed a significant and affirmative relationship between the financial success of the pension plans and offshore investments. David (2014) carried out a study on improving portfolio diversification with uncorrelated market exposure which showed that real assets offer a good mode of diversification. According to Davis, real assets are not correlated with traditional investments and could hence be a good choice for a firm since they are illiquid hence not exposed to speculative trading (2014). Research on how alternative investments affect the financial performance of Kenyan pension funds was done by Mungai and Elly (2018). The study found a significant correlation between return on investments and alternative asset types. Research on the impact of portfolio mix on the financial performance of investment businesses registered on the Nairobi Securities Exchange was

conducted by Kimeu (2015). According to the study, real estate investment has a good impact on businesses' financial success (Kimeu, 2015). Further, a market report published by Cytonn Investments indicated that between the year 2013 and 2018, real estate had an average annual return of 24% which superseded the mainstream investments within the same period (Cytonn Research, 2021).

Conclusion

The analysis and findings of this research correlates with the previous work done on asset allocation and how it affects the pension schemes 'performance. As this study demonstrates, the choice of asset class influences the financial performance of Kenyan Umbrella Retirement Benefit Schemes. The study's findings indicate that the financial performance of URBS is most closely correlated with alternative investments. The alternative asset class is a significant predictor of total weighted returns; p-value (0.038) of less than α=0.05. A 1% increase in the returns of alternative investment is associated with a 1.006% increase in the total weighted returns; the highest impact on total weighted results among all asset classes. This result was supported by findings from the panel data fixed effects regression analysis. This is because the panel data analysis showed that weighted returns of offshore investment, a subset of alternative, had the largest association with total weighted returns among all semi variables: p-value (0.001) of less than α=0.05. A 1% increase in the returns of offshore investments results in a 2.54% increase in total weighted returns. This result shows that fund managers of umbrella schemes should pay more attention to offshore investment opportunities. This study also reveals the practicality of the selected theories that is the Capital Asset Pricing Model, the Modern Portfolio Theory, and the Behavioral Performance Theory in evaluating the asset allocation and financial performance. It is evident from this research the existence of a herding behavior as evidenced by the behavioral performance theory. Most fund managers shift to offshore investments and private equity as it has been evidenced by the increased allocation in 2021 and 2022 thereby positively affecting their performance. The empirical studies that have been done on the impact of asset class choice on pension fund financial performance are also substantially supported by this research. Empirical research suggests that fixed income has a significant impact on pension fund financial performance, which lends additional credence to the Modern Portfolio Theory's recommendation to select a portfolio that maximises returns while minimising risk.

Fixed income accounted for over three quarters of the returns by umbrella schemes in the period from 2018 to 2023. Regression results showed that fixed income is a significant predictor of weighted total returns; p-value of 0.001 that is less than α=0.05. An additional 1% of income generated by fixed income investments is associated with a 0.998% increase in the return of the umbrella schemes. Quoted equity has further demonstrated its impact on pension fund financial performance, thereby bolstering the capital asset pricing model that optimises both return and risk. According to the results of the regression study, the class of investments in stocks has the lowest

total return for each additional 1% rise in income. This class is also a significant predictor of weighted total returns, with a p-value of 0.001 less than α=0.05. An additional 1% of income generated by equity investments is associated with a 0.991% increase in the return of the umbrella schemes. Within the equity asset class quoted equity and unquoted equity were associated with a 0.9602% and 1.4302% respectively in the increase in weighted total returns for every 1% increase in the returns of each class. According to this study, the financial health of registered URBS in Kenya is impacted by the choice of asset type. The research specifically demonstrates that the financial performance of Kenyan Registered URBS is impacted by allocations to equity, fixed income, and alternative assets. The conclusion highlights the significance of allocating alternative investments to URBS's financial returns and the overall performance of Kenya's pension scheme market. The study also reveals that umbrella funds have been greatly underutilizing the alternative investment asset class opportunities considering that they have the lowest weights across the five years. This research indicates that security selection may have an impact on the financial success of Kenyan registered URBS, even though it was not a variable in this analysis. Inadequate data regarding regional equities and private equity investments was the primary source of limitation for this study. Due to this, the study is unable to determine if funding allocation for private equity and regional equities has an impact on the financial performance of Kenyan registered URBS.

Recommendations

The findings of this research underscore the importance of equity, fixed income and alternative investments for umbrella schemes and the Kenyan pension industry at large. Fund managers of registered umbrella schemes should rethink their asset allocation approach and invest more of their funds into the alternative income asset class, especially offshore investments. Their overdependence on fixed income as the main contributor of returns will hold back the growth of returns. Understanding the phenomena of security selection and how it affects the financial performance of Kenya's umbrella retirement benefit systems should be another area of research interest. Furthermore, since regional equities and private equity have not yet been fully embraced by umbrella schemes, it is important to research how the allocation of funds into those two asset classes will ultimately impact the financial performance of Kenya's Umbrella Retirement Benefit Schemes in the years to come.

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