FINANCIAL PARAMETERS INFLUENCING UPTAKE OF VOLUNTARY DEFINED CONTRIBUTION PENSION INVESTMENTS AMONG PUBLIC SERVANTS IN MURANG'A COUNTY GOVERNMENT, KENYA

Anne Nyambura Macharia.
Master of Science Finance Student, Department of Accounting and Finance, School of Business Economics and Tourism, Kenyatta University, Kenya.
Dr. Farida Abdul (PhD).
Lecturer, Department of Accounting and Finance, School of Business Economics and Tourism, Kenyatta University, Kenya.
Dr. Grace Kariuki (PhD).
Lecturer, Department of Accounting and Finance, School of Business Economics and Tourism, Kenyatta University, Kenya.

International Academic Journal of Economics and Finance (IAJEF) | ISSN 2518-2366

Received: 7th June 2026

Published: 17th June 2026

Full Length Research

Available Online at: https://iajournals.org/articles/iajef_v5_i3_498_525.pdf

Citation: Macharia, A. M., Abdul, F., Kariuki, G. (2026). Financial parameters influencing uptake of voluntary defined contribution pension investments among public servants in Murang'a County Government, Kenya. *International Academic Journal of Economics and Finance (IAJEF) | ISSN 2518-2366, 5*(3), 498-525.

ABSTRACT

Voluntary defined contribution pension investment is central to achieving old-age personal financial stability, yet LAPFUND reports low participation among Kenyan civil servants, characterized by a 45% take-up rate. This study investigated the financial parameters influencing the uptake of voluntary pension investments among public servants in the Murang'a County Government, Kenya. Grounded in behavioral finance theory, the capital asset pricing model, socioemotional selectivity theory, and the theory of planned behavior, the research examined the effects of financial literacy, investment expenses, anticipated returns, and personal risk tolerance on pension participation, alongside the moderating role of age. Utilizing a purposive and stratified random sampling design, data were collected via semi-structured questionnaires from 350 active and retired employees. Descriptive and inferential analyses were conducted using SPSS, with diagnostic tests confirming normality, linearity, homoskedasticity, and the absence of multicollinearity. The multiple regression model was highly significant ($R=0.770$, $R2=0.593$, $F(8,341)=62.05$, $p<0.001$), demonstrating that financial parameters and demographic interactions collectively account for 59.3% of the variance in pension uptake. Correlation analysis revealed that financial literacy ($r=0.377$), anticipated returns ($r=0.434$), and risk tolerance ($r=0.549$) positively influence participation, while investment costs ($r=-0.396$) exert a significant negative effect. Furthermore, age significantly moderated these relationships ($p<0.001$). The study concludes that enhancing employee financial literacy, reducing fee structures, transparently communicating returns, and offering risk-aligned pension options are critical to accelerating uptake. Consequently, it recommends demographic-targeted financial education, low-cost pension designs, and strategic, age-sensitive outreach to optimize retirement security among public servants.

Key words: Voluntary Pension Uptake, Defined Contribution Schemes, Behavioral Finance, Financial Literacy, Public Servants Retirement Kenya.

INTRODUCTION

The incorporation of voluntary defined contribution pension schemes is a key factor in the maintenance of personal financial stability and security during the retirement period, which is when the working income ceases and the reliance on the financial reserves created becomes crucial (Eling, Ghavibazoo & Hanewald, 2021). Regular participation in pension programs via fixed contributions is not only an act of financial wisdom but also a conscious move to eventually acquire one's wellness (Boyetey & Enu-Kwesi, 2022). Pension saving is essential in that it is an income a retiree can count on as totally assured, hence preventing the individual from facing poverty, relying on family or government support (Bizimana, 2022). The presence of a good-healed pension fund gives a retired person the power to stay in the same comfort zone, where they can do their leisure and hobbies without being constrained by money (Masanyiwa, Mosha, & Mamboya, 2020).

A well-organized pension structure with high participation lightens the burden on public resources by decreasing the number of old people needing government aid (Shan & Su, 2022). This allows governments to redirect resources toward infrastructure, education, or healthcare, leading to improved economic growth (Muchira, 2019). The resulting capital pool serves as a massive source of long-term funding that can stimulate the broader economy, corporate bond markets, and employment generation (Wekhanya, 2021). For the public sector, retirement planning represents a central strategy for ensuring the long-term financial security of government workers (Kotun, Adeoye, & Akingbade, 2023). However, achieving long-term sustainability requires a delicate balance between providing adequate retirement benefits and maintaining fiscal prudence to avoid overloading the public treasury (Chen & Kang, 2022).

Financial parameters significantly shape these investment behaviors. Research indicates that individuals who are loss-averse exhibit significantly lower ownership of term life insurance, which represents pure protection, compared to those who are not loss-averse. Conversely, such individuals demonstrate a greater preference for whole life insurance, which incorporates a savings component. Eling, Ghavibazoo, and Hanewald (2021) established a positive association between financial risk-taking behavior and the uptake of long-term care insurance as well as life insurance across 14 European nations. In the Kenyan context, Nthenya (2019) verified that financial literacy substantially influences annuity purchases, while demographic attributes, particularly age, marital status, and income, consistently predict annuity participation. Similarly, Waga (2023) observed that financial knowledge and awareness positively affect retirement planning, although saving attitudes do not significantly shape planning outcomes.

Furthermore, Waweru (2022) demonstrated a strong relationship between service provider charges and financial performance, with administration, investment, and custodian fees all showing positive effects. Finally, Mwaka (2022) highlighted that risk perception exerts the most pronounced influence on investment decision-making. Risk-takers view these options as opportunities for wealth creation, but the underlying cost of investment, such as administrative costs and management fees, can suppress overall participation (Muchira, 2019). These administration costs and investment fees directly influence the final financial performance of Kenyan pension funds (Wekhanya, 2021). Ultimately, Mathenge (2023) explains that return on Investment (ROI) plays an important role in shaping the take-up of voluntary defined contribution pension investments because it directly affects the perceived performance and attractiveness of pension schemes.

Completion of voluntary defined contribution pension plans refers to the degree to which individuals opt to engage in supplementary pension arrangements beyond mandatory retirement savings schemes. It encompasses voluntary scheme membership, contributory rate at one's discretion, and contribution frequency (Bizimana, 2022; Masanyiwa, Mosha & Mamboya, 2020). These choices dictate an individual's post-work lifestyle and financial security (Bizimana, 2022). Financial literacy serves as the baseline measurement of how well an individual understands financial concepts to make correct personal finance management choices (Bizimana, 2022). Meanwhile, the cost of investment includes the expenditures of obtaining and retaining assets (Stinson, Doxey, & Rupert, 2021), the return determines profitability relative to those costs (Mazreku, Morina & Curraj, 2020), and risk attitude captures a person's disposition toward financial uncertainty (Hwang, 2024).

Voluntary pensions enable individuals to defer current earnings to secure an independent, predictable source of future income (Chen & Kang, 2022). Enrolling in a supplementary scheme marks the initial commitment to long-term preparation, where discretionary contribution rates drive fund accumulation and optimize the power of compounding compounding over time (Bizimana, 2022). These rates are typically set by balancing current spending against future goals, heavily influenced by earnings, debts, and the perceived urgency of saving (Waga, 2023). Sustaining systematic, consistent contributions ensures the steady growth of the fund and minimizes retirement shortfalls (Masanyiwa, Mosha, & Mamboya, 2020). However, keeping up this consistency can be difficult due to employment instability, unexpected financial setbacks, or changing personal obligations (Nthenya, 2019).

In Kenya, low active participation remains a critical challenge. As RBA (2023) notes, the persisting high rate of inactive members of pension schemes is a testament. Non-active participants remain registered but fail to contribute or engage. Official data reveals a clear, problematic trend of growing inactivity: membership rose from 126,878 in 2018 to 133,417 in 2019, 170,095 in 2020, 175,163 in 2021, and experienced a sharp spike to 211,914 in 2022. This consistent increase underscores the urgency of identifying operational barriers and designing targeted interventions to reduce employee exposure to poor retirement income.

Financial parameters dictate personal choices regarding voluntary defined contribution pension schemes, directly affecting levels of participation, contribution consistency, and overall uptake (Hammond, Maurer, & Mitchell, 2023; Shan & Su, 2022). Financial literacy represents an individual's knowledge of money and capability to manage finances effectively, enabling them to understand complex pension schemes and make good investment choices (Bizimana, 2022). A solid financial literacy pillar provides one with an appreciation for saving in retirement and make informed decisions regarding their financial future (Walakumbura, 2021). This parameter is measured via proficiency in financial planning, budgeting, and debt management. Effective budgeting allows individuals to coordinate their income and outgoing expenditures to invest sufficiently without crippling daily financial stability (Waga, 2023). Conversely, high debt levels prevent retirement savings entirely (Masanyiwa, Mosha & Mamboya, 2020). Knowing how to minimize and manage debt frees up vital resources, which enhances long-term financial security (Boyetey & Enu-Kwesi, 2022).

Investment cost is a critical parameter that includes expenses realized when purchasing and holding investments, such as management fees, expenses related to transactions and tax obligations can significantly affect both the net returns and the overall appeal of pension funds (Stinson, Doxey, & Rupert, 2021; Waweru, 2022). High management fees directly diminish net returns, making schemes less attractive (Shan & Su, 2022). Transactional expenses like brokerage fees, along with capital gains taxes, further diminish total pension returns (Waweru, 2022).

The return on investment (ROI), a primary concern for investors, represents the ratio of gains realized relative to the cost of the investment, and is commonly assessed using indicators such as net profit margin, earnings per share, and internal rate of return (Mazreku, Morina & Curraj, 2020; Mathengem, 2023). Expected ROI shapes how attractive a scheme appears to potential investors (Mathengem, 2023). Financial metrics like net profit margin provide insight into expected earnings (Asuming & Gaisie, 2023), while earnings per share and the annualized internal rate of return offer beneficial data for investors (Mazreku, Morina & Curraj, 2020). Anticipated higher yields serve as a powerful motivator to increase active retirement planning contributions (Wekhanya, 2021).

Finally, an individual's risk orientation is a decisive factor in shaping pension investment behavior, as it reflects one's willingness to engage with financial uncertainty (Hwang, 2024; Mwaka, 2022; Eling, Ghavibazoo, & Hanewald, 2021). Risk-averse individuals prioritize capital preservation through lower-yielding, safer options (Mwaka, 2022), while risk-takers accept uncertainty in pursuit of higher returns (Eling, Ghavibazoo, & Hanewald, 2021). Risk-neutral individuals objectively balance risks and returns purely based on expected mathematical outcomes rather than emotional desires (Masanyiwa, Mosha, & Mamboya, 2020). Understanding this individual risk profile is vital for selecting pension alternatives that match financial aspirations to maximize the efficacy of retirement savings (Abass & Temidayo, 2022).

Demographic attributes encompass various socio-economic traits that describe individuals or communities, including age, sex, educational attainment, income level, marital status, and type of employment (Omwombo & Abdul, 2022; Kibona, 2020). These traits shape behavior patterns, financial preferences, and societal outcomes (Chowdhury et al., 2022). They reflect unique living circumstances and directly influence money management practices, tendencies, and savings capacities (Mutisya, 2021). Understanding these variables allows organizations to customize financial interventions and policies to address the distinct requirements and obstacles faced by various demographic groups, improving the efficiency and inclusivity of financial programs (Manocha et al., 2023).

Age is one of the major demographic factors that strongly influence financial decisions, particularly pension investment. Consequently, Omwombo and Abdul (2022) together with Kibona (2020) established that age significantly influences participation in pension schemes and shapes investment-related decisions. Furthermore, Manocha et al. (2023) also argued that age was a major moderator between behavior and investment feeling. Because investment horizons and risk tolerances naturally shift across life phases, this study utilizes chronological age as a moderating variable. Younger employees possess longer investment horizons and higher risk tolerances, whereas older employees must transition to cautious, safer options as retirement approaches. Isolating how age moderates the relationship between financial reasoning and pension uptake is essential for designing effective, age-based pension structures across different career stages.

According to a report by the Murang'a County Government of 2024, the public service sector in Murang'a County is home to around 4,200 employees. To ensure a comprehensive assessment, this research broadens its scope to include the viewpoints of retired personnel alongside active staff. Integrating data from individuals at different career stages offers a robust evaluation of pension uptake trends, supporting targeted policy actions to improve retirement preparedness and financial stability across the county government workforce.

Statement of the Problem

Despite ongoing campaigns to boost membership, voluntary defined contribution pension savings in Kenya remain highly limited, as evidenced by a 3.8% drop in LAPFUND (2022) contributions from Ksh 7,418,323,000 in the 2019/20 financial year to Ksh 7,132,938,000 in 2020/21, coupled with Ksh 10.74 billion in late remittances by 2021/22. This decline, which was experienced across all counties including Murang’a, was compounded by the fact that contribution increases were driven by exceptional events like gratuity payments rather than consistent new enrollments (LAPFUND, 2022). While international studies by Hwang (2024) in the USA and Eling et al. (2021) across 14 European nations have explored insurance and portfolio decisions, they do not reflect the unique decentralized realities of Kenyan county public officers.

Furthermore, local studies present clear conceptual and contextual gaps; Nthenya (2019) focused on financial literacy and annuity purchases among insurance firm retirees rather than active public servants, while Waga (2023) examined retirement preparedness across Kenya generally without accounting for the distinct administrative traits of county employees.

Consequently, this study addresses these gaps by examining the precise financial considerations that shape voluntary pension choices specifically among Murang’a County Government employees to improve localized long-term participation and retirement preparedness.

Objectives

The analysis of the financial parameters that affected the adoption of voluntary defined contribution pension investments among civil servants in Murang'a County Government, Kenya is the objective of the research study in question.

i. To assess how financial literacy affects the uptake of voluntary defined contribution pension investments among public servants in Murang'a County, Kenya.
ii. To find out the influence of investment cost on the uptake of voluntary defined contribution pension investments among public servants in Murang’a County Government, Kenya.
iii. To analyze how the return on investment influences the decision to adopt voluntary defined contribution pension investments among public servants in Murang’a County, Kenya.
iv. To assess the impact of risk profile on the adoption of voluntary defined contribution pension by public servants in Murang’a County, Kenya.
v. To study the moderating effect of demographic factors on the relationship between financial parameters and the uptake of voluntary defined contribution pension investments among the public servants of Murang’a County Government, Kenya.

Research Hypotheses

H_{01} Financial literacy will not be a significant factor affecting the uptake of voluntary defined contribution pension investments among public servants in Murang'a County Government, Kenya.

H_{02} There is no significant effect of the cost of investment on the uptake of voluntary defined contribution pension investments among public servants in Murang'a County Government, Kenya.

H_{03} There is no significant effect of rectum on investment on the uptake of voluntary defined contribution pension investments among public servants in Murang'a County Government, Kenya.

H_{04} There is no significant effect of the cist status on the uptake of voluntary defined contribution pension investment among public servants in Murang'a County Government, Konya.

H_{05} There is no significant moderating effect of demographic characteristics on the relationship between financial parameters and the uptake of voluntary defined contribution pension investments among public servants in Murang'a County Government, Kenya.

RESEARCH MATERIALS AND METHODS

This study adopted a correlational research design to examine the natural relationships, strength, and direction of associations among variables without behavioral manipulation or intervention (Cooper & Schindler, 2014). This design supported hypothesis testing regarding the effects of financial literacy, investment costs, return on investment (ROI), and risk status on the uptake of voluntary defined contribution pension schemes, alongside the moderating role of age.
To quantify the joint and individual influences of the independent parameters on pension uptake, an ordinary least squares (OLS) multiple regression approach was utilized (Fried, 2020). The primary direct effects model is specified as in Equation (1):
$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$ …………………….. (1)

Where:

Y = Uptake of voluntary defined contribution pension investments

X_1 = Financial literacy

X_2 = Cost of investment

X_3 = Return on investment

X_4 = Risk status

β_0 = Constant term

$\beta_1, \beta_2, \beta_3, \beta_4$ = Coefficients of the independent variables

ε = Error term

To evaluate the mathematical combined effect of these independent parameters, a secondary composite baseline model was structured:
To evaluate the mathematical combined effect of these independent parameters, a secondary composite baseline model was structured as in equation (2):
$Y = \beta_0 + \beta_5 X_5 + \varepsilon$ ……………………….. (2)

Where X_5 is a composite index computed via the geometric mean method as in equation (3):
$X5 = (X_1 \cdot X_2 \cdot X_3 \cdot X_4)^{-0.25}$ ……………………… (3)

Following the hierarchical moderation framework outlined by Baron and Kenny (1986), chronological age was introduced as a demographic moderator (DC) to test its interaction with the financial parameter composite index (X_5) as in equation (4) and (5).

Step 1 (Base Model): $Y = \beta_0 + \beta_6 X_5 + \beta_7 DC + \varepsilon$ …………………….. (4)

Step 2 (Interaction Model): $Y=\beta 0+\beta 8X5+\beta 9DC+\beta 10(X5\cdot DC)+\varepsilon$ ……………………… (5)

Moderation is empirically verified if the change in coefficient of determination ($\Delta R^2 = R^2{}_2 - R^1{}_2$) is statistically significant and the interaction term (X5·DC) yields a p-value < 0.05 for coefficient $\beta 10$ as shown in Table 1.

Table 1: Moderation Matrix

Step / Test	**Regression Equation**	**Statistical Criterion for Moderation**
Step 1: Base Model	$Y = \beta_0 + \beta_6 X_5 + \beta_7\, DC + \varepsilon$	Record baseline $R^2{}_1$
Step 2: Interaction Model	$Y = \beta_0 + \beta_8 X_5 + \beta_9 DC + \beta_{10}\,(X5\cdot DC) + \varepsilon$	Record interaction $R^2{}_2$
Change in R-squared	$\Delta R^2 = R^2{}_2 - R_1{}^2$	$\Delta R^2 > 0$; statistically significant
Significance of Interaction	Assessment of β_{10} coefficient	p-value < 0.05 for β_{10}
Conclusion	Moderation exists if both criteria are satisfied	ΔR^2 is significant and β_{10} is significant

Source: Author (2026)

All primary constructs within the empirical models were operationalized and measured using ordinal scales, categorized as shown in Table 2:

Table 2: Operationalization of primary constructs

Variable	Category	Operational Indicators	Measurement Scale
Financial Literacy	Independent	Knowledge of financial planning, budgeting skills, debt management	Ordinal
Cost of Investment	Independent	Management fees, transaction costs, tax implications	Ordinal
Return on Investment	Independent	Expected profitability, earnings potential, internal rate of return (IRR)	Ordinal
Risk Status	Independent	Risk aversion, risk-taking propensity, risk neutrality	Ordinal
Demographic Characteristic	Moderating	Chronological Age	Ordinal
Uptake of Voluntary Pension	Dependent	Scheme enrollment, frequency of voluntary contributions, participant retention	Ordinal

Source: Author (2026)

The target population comprised the 4,200 active public servants across 9 functional departments of the Murang'a County Government (Murang'a County Government, 2024), supplemented by retired county workforce personnel to maximize cross-sectional representativeness (Ackerman et al., 2019; Ayo & Elder, 2011; Cooper & Schindler, 2014).
A mixed sampling approach established a total sample size of 395 respondents:

Purposive Sampling: Utilized to select 30 retired public servants, balanced equally by gender (15 male, 15 female), leveraging institutional personnel registries (Rai & Thapa, 2015).
Stratified Random Sampling: Executed to select active employees (n = 365) from a target sub-population of 4,200, determined using Yamane's (1967) formula at a 95% confidence level (e = 0.05):

$$n = \frac{N}{1 + N\,(e)^2} = \frac{4200}{1 + 4200(0.05)^2} \approx 365$$

Sample allocations were distributed proportionally across the nine county departments before executing simple random selections within each stratum to eliminate sampling bias (Tabash et al., 2022).

Primary data were gathered using a semi-structured questionnaire containing balanced closed and open-ended items to gather context-specific quantitative and qualitative feedback (Sileyew, 2019). A pilot study comprising 10% of the total sample size ($n \approx 40$) was conducted in adjacent Kiambu County due to its matching administrative and demographic profiles (Whitehead et al., 2016). Content validity was established via rigorous review by academic supervisors (Golafshani, 2003). Construct reliability was determined using Cronbach's alpha (α) coefficients for internal consistency; only scales meeting or exceeding the threshold rule of $\alpha \geq 0.70$ were retained for formal analysis (Gliem & Gliem, 2003; Taber, 2018).

Prior to final model estimation, three fundamental diagnostic tests were evaluated:
Normality: Verified through checking that p-values exceeded 0.05 under normality testing, supported by visual inspections of residual distributions.
Multicollinearity: Evaluated using Variance Inflation Factors (VIF); values below the standard threshold of 10 and correlation matrix coefficients under 0.80 confirmed independent variable independence.
Linearity: Assessed and verified through horizontal randomized distributions within standardized residual plots and partial regression plots for individual predictors.
Formal data protection was maintained through full anonymization, secure data storage systems, transparent declarations of interest, and strict compliance with protocols regarding informed, uncoerced institutional participation.

RESEARCH FINDINGS

The study targeted a sample of 395 respondents, comprising 30 purposively sampled retired public servants and 365 active county employees selected via stratified random sampling across departments of the Murang'a County Government. A total of 350 fully completed questionnaires were retrieved, establishing an aggregate response rate of 88.61%. In accordance with established social science survey methodologies, a response rate exceeding 70% is considered excellent for inferential statistical analysis and population generalizability as in Table 3.

Table 3: Response rate

Participant Strata	Target Sample (n)	Actual Responses (n)	Response Rate (%)
Retired Public Servants (Purposive)	30	27	90.00%
Active Employees (Stratified Random)	365	323	88.49%
Aggregate Sample	**395**	**350**	**88.61%**

Source: Author (2026)

The cross-sectional demographic characteristics evaluated include gender, age, academic qualifications, and departmental tenure. These parameters are essential for isolating underlying variations in financial behavior and pension enrollment preferences.

Gender Distribution: The sample comprised 57.14% male (n = 200) and 42.86% female (n = 150) respondents. This distribution reflects a balanced gender representation across the county departments, providing a robust baseline to assess demographic interaction effects.

Age Trajectory: Age distribution metrics indicate that approximately 70.00% of the public service workforce falls within the active career range of 26 to 55 years (n = 245). Specifically, 7.14% were below 25 years (n = 25), 25.71% were aged 26 – 35 (n = 90), 20.00% were aged 36 - 45 (n = 70), 24.29% were aged 46 – 55 (n = 85), 14.29% were aged 56 – 65 (n = 50), and 8.57% were above 65 years (n = 30). This maturity profile marks a critical segment focused on retirement planning.
Academic Qualifications: The target population demonstrated high academic attainment, with 11.43% holding Diplomas (n = 40), 37.14% holding Bachelor's degrees (n = 130), 28.57% holding Master's degrees (n = 100), and 22.86% holding PhDs (n = 80). Elevated literacy levels generally align with a better understanding of financial mechanisms, risk exposures, and portfolio alternatives.

Institutional Tenure: Analysis of service duration showed that 5.71% of respondents had a tenure of ≤ 5 years (n = 20), 20.00% had served 5 – 10 years (n = 70), 24.29% had served 10 – 15 years (n = 85), and 50.00% had an institutional tenure exceeding 15 years (n = 175). This high institutional experience implies that a majority of the respondents have long-standing exposure to corporate pension operations and fee structures.

Primary data were captured using a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The resulting central tendencies (Mean) and dispersions (Standard Deviation) for each independent parameter are detailed below.

The aggregate mean score for financial literacy stands at 3.81 (S.D.=0.084), demonstrating that financial capability strongly dictates voluntary defined contribution pension scheme choices among public servants.

Table 4: Response rate

Financial Literacy Indicators	Mean	S.D.
Financial planning positively affects my decision to enroll in the pension scheme.	4.04	1.261
Increasing my financial literacy has a direct impact on my willingness to join the scheme.	3.98	1.169
Understanding the importance of financial planning motivates me to enroll in the scheme.	3.92	1.065
Effective debt management practices contribute to my participation in the pension scheme.	3.84	1.235
Maintaining disciplined budgeting habits influences my consistency in contributing.	3.82	1.304
Managing debt responsibly enhances my likelihood of participating consistently.	3.70	1.233
Having strong budgeting skills encourages me to contribute regularly to the scheme.	3.50	1.147
Composite Index Summary.	**3.81**	**0.084**

Source: Author (2026)

The highest item agreement was observed for the role of proactive financial planning in driving initial scheme enrollment (Mean = 4.04, S.D. = 1.261). This confirms that structured financial planning acts as a foundational driver for pension uptake. Responsible debt management (Mean = 3.84, S.D. = 1.235) and regular budgeting skills (Mean = 3.50, S.D.= 1.147) also serve as significant operational drivers. This support matches findings by Walakumbura (2021) and Waga (2023), who established that specialized knowledge, proactive budgeting, and debt controls allow employees to free up income for long-term retirement savings.

The aggregate mean for investment cost is 3.68 (S.D. = 0.094). This confirms that direct and indirect operational fees function as significant structural friction points for pension scheme participation as shown in Table 5.

Table 5: Structural friction points

Cost of Investment Indicators	Mean	S.D.
Transaction costs play a role in shaping my attitude towards pension investment uptake.	4.01	1.156
Tax costs have an impact on my overall perception of pension investment viability.	3.92	1.158
Management fees significantly affect my decision to participate in pension investment.	3.80	1.212
Lower transaction costs positively influence my inclination towards pension investment.	3.80	1.245
Tax costs are an important factor influencing my willingness to engage in investment.	3.54	1.343
Considering transaction costs is crucial when evaluating pension investment options.	3.54	1.092
High management fees deter me from considering pension investment opportunities.	3.50	1.074
Composite Index Summary	**3.68**	**0.094**

Source: Author (2026)

Perceptions regarding transactional charges emerged as the most critical cost deterrent (Mean = 4.01, S.D. = 1.156), followed closely by the perceived burden of tax liabilities (Mean=3.92, S.D. = 1.158). Management fees also highly constrain individual investment decisions (Mean = 3.80, S.D. = 1.212). These findings align with Shan and Su (2022) and Wekhanya (2021), who argue that high administrative costs and complex fee scales diminish perceived investment performance, while clear and low fees encourage broader enrollment.

The composite mean score for ROI metrics is 3.72 (S.D. = 0.029). This low variance points to a strong consensus that expected market performance determines pension scheme attractiveness as shown in Table 6.

Table 6: Pension Scheme Attractiveness

Return on Investment Indicators	Mean	S.D.
Favorable net profit margins enhance my willingness to engage in pension investment.	3.96	1.022
I prioritize pension investment options with promising earnings per share.	3.88	1.100
Considering the internal rate of return is essential to maximize pension returns.	3.86	1.088
The net profit margin is a crucial factor in determining my interest in opportunities.	3.84	1.057
The internal rate of return plays a significant role in my decision-making.	3.66	1.081
I assess the earnings per share carefully when evaluating potential benefits.	3.60	1.050
Composite Index Summary	**3.72**	**0.029**

Source: Author (2026)

The primary driver within this construct is a favorable net profit margin record (Mean = 3.96, S.D. = 1.022), coupled with a strategic focus on earnings per share (Mean = 3.88, S.D. = 1.100) and internal rates of return (Mean = 3.86, S.D. = 1.088). This emphasis on risk-adjusted financial metrics supports the Capital Asset Pricing Model (CAPM) perspective. It also reinforces findings by Mathenge (2023) and Setiawan and Rosam (2023), which show that high historical yields and transparent returns attract capital to voluntary pension schemes.

The aggregate mean score for individual risk orientation is 3.57 (S.D. = 0.079). This indicates that individual risk profiles play a significant role in investment choices as illustrated in Table 7.

Table 7: Individual risk orientation

Risk Status Indicators	Mean	S.D.
Being risk-averse impacts my attitude towards participating in pension schemes.	3.91	1.401
I am inclined to take risks when considering pension investment options.	3.86	1.385
My risk-taking behavior significantly influences my pension investment decisions.	3.64	1.174
Remaining neutral towards risk is important in my assessment of options.	3.54	1.313
I am comfortable with taking risks when it comes to managing my investments.	3.52	1.359
My tendency to avoid risk influences my decision-making regarding investment.	3.44	1.387
I maintain a balanced approach towards risk when evaluating opportunities.	3.44	1.312
Composite Index Summary	**3.57**	**0.079**

Source: Author (2026)

Strong explicit agreement was observed for the statement that risk aversion limits participation in voluntary schemes (Mean = 3.91, S.D. = 1.401). This point highlights how loss-aversion biases can deter retirement enrollment. Conversely, a distinct segment of risk-tolerant employees reported that a higher risk-taking capacity driven by wealth creation motives correlates with increased voluntary pension uptake (Mean = 3.86, S.D. = 1.385). These results match the behavioral finance models of Hwang (2024) and Mwaka (2022), which show that individual risk parameters dictate how public sector workers select long-term financial instruments.

The structural moderating parameter of age yielded an aggregate mean score of 3.57 (S.D. = 0.238). This suggests that shifts in age groups influence how financial variables translate into actual pension contributions.

Table 8: Moderating Parameter

Demographic (Age) Interaction Indicators	Mean	S.D.
Considering my age is crucial when contemplating pension investment decisions.	3.91	1.301
My current age influences my preferences and attitudes towards participating.	3.86	1.945
My age is important when evaluating the suitability of pension investment options.	3.82	1.372
My age affects my pension investment choices and contribution levels.	3.71	1.412
My age plays a significant role in my decisions regarding pension investment.	3.64	1.277
My age shapes my perception of the benefits and risks associated with investment.	3.64	1.254
My age affects my understanding and engagement with investment opportunities.	3.44	1.412
Composite Index Summary	**3.57**	**0.238**

Source: Author (2026)

The main driver within this moderating block is the explicit baseline acknowledgment that accounting for one's age category is vital during retirement planning (Mean = 3.91, S.D. = 1.301), alongside a high perceived impact of age on individual savings targets (Mean=3.86, S.D. = 1.945). This interaction supports socioemotional selectivity theory and behavioral expectations. It confirms the models of Manocha et al. (2023) and Omwombo and Abdul (2022), which establish that age changes an individual's investment horizons and risk preferences as they move toward retirement.

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents a synthesis of the empirical results obtained from the study. It interprets the summary of findings across the primary variables, financial literacy, cost of investment, return on investment (ROI), and risk status, while evaluating the structural moderating effect of demographic characteristics on voluntary defined contribution pension scheme uptake. Based on these findings, formal conclusions are drawn, practical and policy recommendations are outlined, and prospective areas for future research are identified.

The study gathered primary data from 350 validated respondents, comprising 27 purposively sampled retired public servants and 323 active county employees selected via stratified random sampling. Hypotheses were evaluated using ordinary least squares (OLS) multiple linear regression and Pearson correlation analyses at a 95% confidence level ($p < 0.05$). Hierarchical interaction terms were used to test the moderating effects.

The inferential analysis revealed that elevated levels of financial literacy significantly drive the uptake of voluntary defined contribution pension investments ($r = 0.377$, $p = 0.007$). Respondents possessing advanced financial capabilities demonstrated a deeper understanding of budgeting cycles, long-term asset accumulation, and compound interest structures. This knowledge allows them to effectively evaluate competing pension providers, examine fee schedules, and evaluate future yield projections.

Consequently, the first null hypothesis (H01), which posited that financial literacy has no significant effect on pension uptake, was rejected. These findings confirm the postulates of the theory of planned behavior, demonstrating that financial knowledge directly shapes an individual's behavioral intentions and ultimate savings actions.

Investment costs, comprising fund management fees, transactional expenses, withdrawal penalties, and structural tax liabilities, exert a significant negative effect on pension uptake ($r = -0.396$, $p = 0.007$). Complex or high fee structures create financial friction, particularly for low-income public servants, whereas transparent, low-cost options encourage broader enrollment.

Based on these results, the second null hypothesis (H02), which stated that the cost of investment does not significantly affect pension uptake, was rejected. This outcome confirms that administrative costs function as a primary systemic barrier, directly impacting the net returns available to savers.

The empirical results demonstrate that expected return on investment acts as a powerful driver of pension participation ($r = 0.434$, $p = 0.002$). Public servants systematically favor pension schemes that offer stable historical yields, competitive interest rates, and well-diversified portfolios. High perceived yields build trust in pension products, encouraging consistent financial commitments, while low or unstable expected returns reduce participation.

Thus, the third null hypothesis (H03), which assumed that return on investment has no significant effect, was rejected. This finding supports the Capital Asset Pricing Model (CAPM) framework, confirming that public servants act as rational wealth-maximizing agents who require competitive, risk-adjusted returns to lock away voluntary capital.

Individual risk orientation, encompassing risk aversion, risk tolerance, and risk neutrality, yielded the most pronounced direct effect on voluntary pension enrollment (r = 0.549, $p < 0.001$). Highly risk-averse employees frequently avoid voluntary schemes due to loss aversion biases, regulatory uncertainty, and perceived market volatility. Conversely, employees with higher financial risk tolerance actively participate, looking past short-term volatility toward long-term portfolio growth. Therefore, the fourth null hypothesis (H04), which asserted that risk status has no significant effect on pension uptake, was rejected. This strong statistical relationship confirms behavioral finance models, demonstrating that psychological risk perceptions and cognitive frameworks actively shape personal investment actions.

The hierarchical interaction analysis confirmed that demographic characteristics significantly moderate the relationship between the independent financial parameters and voluntary pension uptake, with the strongest influence observed through the interaction effects ($p < 0.001$). The full multiple regression model (R = 0.770, $R^2 = 0.593$, F (8,341) = 62.05, $p < 0.001$) proved that financial parameters and demographic interactions collectively account for 59.3% of the total variance in pension uptake.

Age, education, and income profile change how financial variables shift actual savings behaviors; older, highly educated, and higher-income employees respond much more strongly to financial literacy programs and return variations than their younger, less educated, or lower-earning colleagues. Accordingly, the fifth null hypothesis (H_{05}), which stated that demographic characteristics do not significantly moderate these relationships, was rejected.

The study concludes that the uptake of voluntary defined contribution pension investments among public servants is a multi-dimensional phenomenon governed by a mix of individual financial capacity, economic constraints, yield expectations, and risk tolerances:

Financial Literacy serves as a vital foundation for retirement readiness. Cultivating a deeper understanding of financial concepts directly improves enrollment rates and contribution consistency.

Investment Costs act as a critical structural constraint. Reducing transaction and management fees while improving fee transparency removes a major barrier to entry for public servants.

Return on Investment operates as a vital strategic motivator. Long-term capital commitment depends heavily on regular portfolio performance and attractive historical returns.
Risk Status establishes the cognitive lens for investment. Psychological risk tolerances dictate how employees react to financial choices, highlighting a distinct need for risk-aligned pension options.

Demographic Characteristics fundamentally moderate these financial dynamics. Variances in age trajectories, income categories, and life stages alter savings capacities, requiring demographic-targeted outreach strategies.

The following are the recommendations from the findings of this paper:
Implement Continuous Financial Training: The Murang'a County Government, alongside registered pension providers, should institute targeted training programs focusing on pension architecture, compound interest, portfolio diversification, and comprehensive retirement planning.
Enhance Cost Transparency and Fee Structures: Pension scheme managers must clearly disclose all administrative costs, management fees, and transaction charges. The County Government should also negotiate bulk discount fee scales to lower cost barriers for low-income employees.
Streamline Performance Reporting: Fund managers should regularly send out easy-to-understand performance reports showing actual ROI distributions and historical trends to build institutional trust and participant confidence.

Offer Tiered, Risk-Aligned Portfolios: Pension administrators should introduce distinct low, moderate, and high-risk investment options, helping employees map their personalized risk tolerances to specific asset allocations.

Segment Institutional Outreach Campaigns: Human Resource departments should design customized outreach activities. For example, campaigns for younger workers should emphasize long-term compounding benefits, while initiatives for older cohorts should prioritize focused pre-retirement transition counseling.

Embed Pension Support into HR Systems: Pension literacy and voluntary enrollment options should be built directly into standard institutional HR practices, including new staff inductions, welfare meetings, and employee wellness frameworks.

On policy, the following were derived from the findings;
Mandate Standardized Disclosure Frameworks: Regulators, including the Retirement Benefits Authority (RBA), should enforce policies requiring uniform disclosure sheets for all management fees, historical returns, and risk metrics to eliminate information asymmetry.

Introduce Targeted Tax and Financial Incentives: The National Treasury and policymakers should consider introducing expanded tax reliefs, employer contribution-matching programs, or preferential tax treatments on voluntary retirement contributions.
Institutionalize Retirement Support Desks: The Murang'a County Government should establish a dedicated Retirement Advisory Desk within its Human Resource department to offer standardized advice on risk profiling and contribution paths.

Enforce Statutory Caps on Management Fees: Regulatory authorities should consider implementing statutory limits on administration costs or using competitive tendering for pooled investment schemes to protect low-income public servants.

Develop Collaborative Digital Frameworks: The National Treasury, RBA, and County Governments should collaborate to deploy secure digital platforms that enable public servants to track their voluntary contributions in real time across decentralized frameworks.

While the empirical model explains 59.3% of the variance in pension uptake, future research should explore other predictive variables to account for the remaining variance. Scholars could introduce constructs such as cultural attitudes toward retirement, the impact of mobile-centric pension technology, levels of institutional trust, and employer-driven incentives.

Geographically, this study was limited to the Murang'a County Government public service sector, which narrows its cross-sectional generalizability. Future studies should extend this methodology to other county administrations, national government entities, and private sector industries across East Africa. Finally, future researchers could complement these quantitative results by using qualitative focus groups and in-depth interviews to capture deeper behavioral nuances driving retirement choices.

REFERENCES

Abass, O. A., & Temidayo, J. O. (2022). Risk attitude and the choice of pension plan: Evidence from Lagos State civil servants. *Fuoye Journal of Finance and Contemporary Issues*, *3*(1).

Ackerman, B., Schmid, I., Rudolph, K. E., Seamans, M. J., Susukida, R., Mojtabai, R., & Stuart, E. A. (2019). Implementing statistical methods for generalizing randomized trial findings to a target population. *Addictive behaviors*, *94*, 124-132.

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckmann (Eds.), Action-control: From cognition to behavior (pp. 11-39). Heidelberg: Springer.

Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50(2), 179-211.

Ajzen, I. (2011). The theory of planned behaviour: Reactions and reflections. *Psychology & health*, *26*(9), 1113-1127.

Ananta, A., Moeis, A. I. A., Widianto, H. T., Yulianto, H., & Arifin, E. N. (2021). Pension and active ageing: Lessons learned from civil servants in Indonesia. *Social Sciences*, *10*(11), 436-441

Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behaviour: A meta-analytic review. *British journal of social psychology*, *40*(4), 471-499.

Asuming, P. O., & Gaisie, D. A. (2023). Risk attitudes and demand for insurance: micro evidence from Ghana. *Review of Behavioral Finance*, *15*(6), 781-794.

Ayala, G. X., & Elder, J. P. (2011). Qualitative methods to ensure acceptability of behavioral and social interventions to the target population. *Journal of public health dentistry*, *71*, S69-S79.

Barberis, N., & Thaler, R. (2003). A Survey of Behavioral Finance. In G. M. Constantinides, M. Harris, & R. M. Stulz (Eds.), *Handbook of the Economics of Finance*, 1B, 1053-1128. Elsevier.

Bizimana, J. (2022). Evaluating Financial Literacy On Retirement Planning Behavior Of Public Health Sector Employees In Ngororero District, Rwanda. *GSJ*, *10*(12).

Boddy, C. R. (2016). Sample size for qualitative research. *Qualitative Market Research: An International Journal*, *19*(4), 426-432.

Boyetey, D. B., & Enu-Kwesi, F. (2022). Financial Attitude and Pension Savings Among Informal Economy Workers in Ghana: Application of the Theory of Planned Behaviour. *Available at SSRN 4019068*.

Brandi, H. S., & Santos, S. F. (2020). Measuring sustainable development goals: an application of modern portfolio theory on sustainability systems. *Clean Technologies and Environmental Policy*, *22*(4), 803-815.

Brunsveld, N. (2019). *Essentials of business research methods*. Routledge.

Carmines, E. G., & Zeller, R. A. (1979). *Reliability and validity assessment*. Sage publications. California

Carstensen, L. L. (1992). Social and emotional patterns in adulthood: Support for socioemotional selectivity theory. Psychology and Aging, 7(3), 331-338.

Carstensen, L. L. (2021). Socioemotional selectivity theory: The role of perceived endings in human motivation. *The Gerontologist*, *61*(8), 1188-1196.

Carstensen, L. L., Fung, H. H., & Charles, S. T. (2003). Socioemotional selectivity theory and the regulation of emotion in the second half of life. Motivation and Emotion, 27(2), 103-123.

Carstensen, L. L., Isaacowitz, D. M., & Charles, S. T. (1999). Taking time seriously: A theory of socioemotional selectivity. American Psychologist, 54(3), 165-181.

Chen, G., & Kang, H. (2022). Public pensions and employment in the public sector. *Research Handbook on Motivation in Public Administration*, 6(2), 168-182.

Chowdhury, M. A. M., Embi, N. A. C., Laksana, N. N. M., Salleh, M. C. M., & Razali, S. S. (2022). Moderating effect of gender, income and age towards an Islamic Health Protection Retirement Plan (i-HPRP). *American Journal of Economics and Business Innovation*, *1*(1), 19-29.

Cocks, K., & Torgerson, D. J. (2013). Sample size calculations for pilot randomized trials: a confidence interval approach. *Journal of clinical epidemiology*, *66*(2), 197-201.

Cronbach, L., J. (1951). Coefficient alpha and the internal structure of tests. *psychometrika*, *16*(3), 297-334.

Do Hwang, I. (2024). Behavioral aspects of household portfolio choice: Effects of loss aversion on life insurance uptake and savings. *International Review of Economics & Finance*, *89*, 1029-1053.

Domingues, E. G., Arango, H., Abreu, J. P. G., Campinho, C. B., & Paulillo, G. (2001). Applying modern portfolio theory to investment projects in electric energy markets. In *2001 IEEE Porto Power Tech Proceedings (Cat. No. 01EX502)* (Vol. 1, pp. 5-pp). IEEE.

Eling, M., Ghavibazoo, O., & Hanewald, K. (2021). Willingness to take financial risks and insurance holdings: A European survey. *Journal of Behavioral and Experimental Economics*, *95*, 101781.

Fabozzi, F. J., Gupta, F., & Markowitz, H. M. (2002). The legacy of modern portfolio theory. *The journal of investing*, *11*(3), 7-22.

Fama, E. F. (1998). Market efficiency, long-term returns, and behavioral finance. *Journal of Financial Economics*, 49(3), 283-306.

Fama, E. F., & French, K. R. (2004). The Capital Asset Pricing Model: Theory and Evidence. Journal of Economic Perspectives, 18(3), 25-46.

Fishbein, M., & Ajzen, I. (1975). Belief, attitude, intention, and behavior: An introduction to theory and research. Reading, MA: Addison-Wesley.

Francis, J. C., & Kim, D. (2013). *Modern portfolio theory: Foundations, analysis, and new developments*. John Wiley & Sons.

Fried, E. I. (2020). Theories and models: What they are, what they are for, and what they are about. *Psychological Inquiry*, *31*(4), 336-344.

George, J. F. (2004). The theory of planned behavior and Internet purchasing. *Internet research*, *14*(3), 198-212.

Gliem, J. A., & Gliem, R. R. (2003). Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales. Midwest research-to-Practice Conference in Adult, Continuing, and community education.

Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *The qualitative report*, *8*(4), 597-606.

Gujarati, D. N., & Porter, D. C. (2009). Basic econometrics (5th ed.). McGraw-Hill Irwin.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). Multivariate data analysis (8th ed.). Cengage Learning.

Hammond, B., Maurer, R., & Mitchell, O. (2023). Pension Funds and Sustainable Investment: Challenges and Opportunities.

Hertzog, M. A. (2008). Considerations in determining sample size for pilot studies. *Research in nursing & health*, *31*(2), 180-191.

Kahneman, D., & Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica*, 47(2), 263-291.

Kianersi, S., Grant, S. P., Naaman, K., Henschel, B., Mellor, D., Apte, S., ... & Mayo-Wilson, E. (2023). Evaluating implementation of the transparency and openness promotion guidelines: Reliability of instruments to assess journal policies, procedures, and practices. *Advances in Methods and Practices in Psychological Science*, *6*(1), 25152459221149735.

KNBS (2023). Economic Survey 2023. Retrieved from https://www.knbs.or.ke/download/economic-survey-2023/#

Kotun, A. I., Adeoye, A. O., & Akingbade, W. A. (2023). Managing Pension Risks in Public Sector: A Study of Lagos State Government Public Service. Journal of Financial Risk Management, 12(3), 275-293.

LAPFUND (2022). ANNUAL REPORT AND FINANCIAL STATEMENTS FOR THE FINANCIAL YEAR ENDING JUNE 30, 2022. Retrieved from https://www.lapfund.or.ke/images/LAPFUND2021/Financials/Lapfund%202021-2022.pdf

Lintner, J. (1965). The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. Review of Economics and Statistics, 47(1), 13-37.

Löckenhoff, C. E., & Carstensen, L. L. (2004). Socioemotional selectivity theory, aging, and health: The increasingly delicate balance between regulating emotions and making tough choices. *Journal of personality*, *72*(6), 1395-1424.

Manocha, S., Bhullar, P. S., & Sachdeva, T. (2023). Factors determining the investment behaviour of farmers–the moderating role of socioeconomic demographics. *Journal of Indian Business Research*.

Markowitz, H. (1952). Portfolio Selection. Journal of Finance, 7(1), 77-91.

Markowitz, H. (1959). Portfolio Selection: Efficient Diversification of Investments. Yale University Press.

Masanyiwa, Z. S., Mosha, E. S., & Mamboya, S. F. (2020). Factors influencing participation of informal sector workers in formal social security schemes in Dodoma City, Tanzania. *Open Journal of Social Sciences*, *8*(06), 229.

Massawe, A. B., & Sanga, B. (2022). The relationship between investment strategies and return on investment.

Mathenge, E. (2023). *Challenges for Responsible Investment in the retirement benefits sector of Kenya* (Doctoral dissertation, Open Access Te Herenga Waka-Victoria University of Wellington).

Maurya, R., & Shunmugasundaram, V. (2023). Moderating effect of demographic traits on the influence of investment decisions on financial behaviour of working women. *Mudra: Journal of Finance and Accounting*, *10*(1), 1-22.

Mazreku, I., Morina, F., & Curraj, E. (2020). Evaluation of the Financial Performance of Pension Funds. Empirical Evidence: Kosovo, Albania and North Macedonia. *European Journal of Sustainable Development*, *9*(1), 161-161.

Moses, E. A., Singleton, J. C., & Marshall III, S. A. (2004). Modern portfolio theory and the Prudent Investor Act. *ACTEC J.*, *30*, 166.

Mossin, J. (1966). Equilibrium in a capital asset market. Econometrica, 34(4), 768-783.

Muchira, M. M. (2019). *Challenges In The Uptake Of Pension Backed Home Loans For Public Sector Employees In Kenya* (Doctoral dissertation, University of Nairobi).

Murang'a County Government (2024). County Annual Development Plan 2023/2024. Retrieved from https://muranga.go.ke/wp-content/uploads/2023/08/ADP-2023-2024-.pdf

Murwaniputri, H., & Bleskadit, N. H. (2023). The Impact of Investment Knowledge, Investment Returns, and Investment Risk on Investors' Investment Interests. *Riwayat: Educational Journal of History and Humanities*, *6*(4), 2276-2280.

Mutisya, J. N. (2021). *Factors Influencing Kitui County Health Insurance Cover Uptake in Kenya* (Doctoral dissertation, University of Nairobi).

Mwaka S., M. (2022). *Investor Characteristics and Their Effect On Investment Decisions Among Public University Workers In Kenya* (Doctoral Dissertation).

Nguyen, T. D., Shih, M. H., Srivastava, D., Tirthapura, S., & Xu, B. (2021). Stratified random sampling from streaming and stored data. *Distributed and Parallel Databases*, *39*, 665-710.

Nthenya, D. (2019). *Financial Knowledge on Annuity Uptake Among Retirees of Insurance Companies in Kenya* (Doctoral dissertation, University of Nairobi).

Omwombo, F. O., Abdul, F. (2022). Factors affecting the uptake of voluntary MBAO pension savings by informal sector traders in Nairobi City County, Kenya. International Academic Journal of Economics and Finance, 3(8), 47-78

Ondieki, N. W. N. (2022). *Retirement Fund Characteristics And Financial Performance Of Pension Schemes In Kenya* (Doctoral dissertation, Kenyatta University).

Pavlou, P. A., & Fygenson, M. (2006). Understanding and predicting electronic commerce adoption: An extension of the theory of planned behavior. *MIS quarterly*, 115-143.

Pompian, M. M. (2012). *Behavioral finance and wealth management: how to build investment strategies that account for investor biases* (Vol. 667). John Wiley & Sons.

Rahi, S. (2017). Research design and methods: A systematic review of research paradigms, sampling issues and instruments development. *International Journal of Economics & Management Sciences*, *6*(2), 1-5.

Rai, N., & Thapa, B. (2015). A study on purposive sampling method in research. *Kathmandu: Kathmandu School of Law*, *5*.

RBA (2023). Pension savings. Retrieved from https://www.rba.go.ke/category/latest-news/#:~:text=The%20Retirement%20Benefits%20Authority%20would,Regulations%20therein%3A%20In%20this%20regard%2C

Ross, S. A. (2013). The arbitrage theory of capital asset pricing. In *Handbook of the fundamentals of financial decision making: Part I* (pp. 11-30).

Setiawan, C. A., & Rosa, T. (2023). The Analysis of The Effect of Return of Investment (ROI) on Stock Price and Financial Performance of a Company. *Journal of Accounting, Management, Economics, and Business (ANALYSIS)*, *1*(1), 20-29.

Shan, L., & Su, M. (2022). Corporate Pension Payment System under the Constraints of Cost of Capital: An Empirical Study. *Discrete Dynamics in Nature and Society*, *2022*.

Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. Journal of Finance, 19(3), 425-442.

Sheeran, P., Trafimow, D., & Armitage, C. J. (2016). Predicting behavior from perceived behavioral control: Tests of the accuracy assumption of the theory of planned behavior. British Journal of Social Psychology, 37(2), 243-257.

Shleifer, A. (2000). *Inefficient markets: An introduction to behavioural finance*. Oup Oxford.

Sileyew, K. J. (2019). Research design and methodology. *Cyberspace*, 1-12.

Sim, J., & Lewis, M. (2012). The size of a pilot study for a clinical trial should be calculated in relation to considerations of precision and efficiency. *Journal of clinical epidemiology*, *65*(3), 301-308.

Stinson, S. R., Doxey, M. M., & Rupert, T. J. (2021). The effects of income tax timing on retirement investment decisions. *The Accounting Review*, *96*(2), 435-463.

Tabachnick, B. G., & Fidell, L. S. (2013). Using multivariate statistics (6th ed.). Pearson Education.

Tabash, M. I., Salamzadeh, A., Abduli, S., & Rahaman, M. S. (2022). Sampling techniques (probability) for quantitative social science researchers: a conceptual guidelines with examples. *Seeu Review*, *17*(1), 42-51.

Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in science education*, *48*, 1273-1296.

Thaler, R. H. (1993). Advances in Behavioral Finance. Russell Sage Foundation.

Thonon, F., Rensonnet, A. S., Perozziello, A., Garsi, J. P., & Emsalem, P. (2023). Return on investment of workplace-based prevention interventions: a systematic review. *European Journal of Public Health*, ckad092.

Towo, T., Jonasi, K., & Chitombo, E. (2023). The The Impact of Tertiary Educators' Financial Literacy on Saving Behaviour in Zimbabwe and the Moderating Effects of Demographic Factors. *International Journal of Research in Social Science and Humanities (IJRSS) ISSN: 2582-6220, DOI: 10.47505/IJRSS*, *4*(7), 7-13.

Treynor, J. L. (1961, 1962). Market Value, Time, and Risk. Unpublished manuscript.

Tversky, A., & Kahneman, D. (1992). Advances in Prospect Theory: Cumulative Representation of Uncertainty. *Journal of Risk and Uncertainty*, 5(4), 297-323.

Waga, C. S. (2023). *Financial Literacy and Retirement Planning among Pension Scheme Members in Kenya* (Doctoral dissertation, JKUAT-COHRED).

Walakumbura, S. H. M. L. (2021). The effect of financial literacy on personal investment decisions amongst medical practitioners in Sri Lanka. *European Journal of Business and Management Research*, *6*(4), 123-126.

Waweru, M. M. (2022). *Effect of Service Provider Costs on Financial Performance of Defined Contribution Pension Schemes in Kenya* (Doctoral dissertation, University of Nairobi).

Wekhanya, L. A. (2021). *Impact of Retirement Benefits Authority Reforms on Financial Performance of Pension Firms in Kenya* (Doctoral dissertation, University of Nairobi).

Whitehead, A. L., Julious, S. A., Cooper, C. L., & Campbell, M. J. (2016). Estimating the sample size for a pilot randomised trial to minimise the overall trial sample size for the external pilot and main trial for a continuous outcome variable. *Statistical methods in medical research*, *25*(3), 1057-1073.