THE INTERNATIONAL JOURNAL OF BUSINESS & MANAGEMENT

Influence of Investment Management Practices on Sustainability of Pension Funds Administrative Institutions in Kenya

D.K, Nduruhu
Accountant, Department of Finance,
Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenya
G. S. Namusonge
Professor, School of Procurement and Management,
Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenya
K. Kabare
Lecturer, Department of Entrepreneurship, Technology, Leadership and Management
Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenya

Abstract:
This study sought to evaluate the influence of investment management practices on the sustainability of pension funds administrative institutions (PFAIs) in Kenya. The study adopted a correlation research design with a target population of 85 PFAIs operating in Kenya from 2008 to 2016. Stratified sampling technique was used to select the sample size and a sample size of 70 PFAIs was drawn from the target population using Slovin's formula. The study utilized both primary and secondary data with the primary data collected using structured questionnaire and data was analysed using descriptive and inferential statistics in SPSS version 20.The reliability of the instrument was tested by using Cronbach alpha, correlation analysis to test the strength of the relationships between the variables and linear regression was used to determine the form of the relationship between the dependent and independent variables. The results show that investment management practices significantly and positively influences the financial sustainability of PFAIs in Kenya ($r^2 = 0.208$, $p< 0.05$).It is therefore recommended that PFAIs management should consistently review investment strategies and investment guidelines with a view to enhancing investment choices that are fully compliant with the investment policy statements (IPS) to improve on their operational and financial sustainability.

Keywords: *Investment, management, practices, pension, sustainability, institutions*

1. Introduction

Financial sustainability is a core principle of social security (Billing &Menard, 2013).Navajas et al., (2000) defines sustainability as the ability to repeat performance through a long time. It is a positive financial state in which fund revenues exceed fund expenditures (Chadwick et al., 2014) and indicates the possibility of making profit out of the pension fund administrative institutional operations allowing continuous provision of pension administrative services to the pension funds. Adongo & Stock (2006) states that specific sustainable practices can lead to specific competitive outcomes. Nidumolu, et al., (2009) reported that sustainability when considered strategically, can be a source of competitive advantage and a key driver of innovations for firms. According to Tijjani (2014), an efficient pension funds administrator should deliver at a reasonable cost, a pension that provides a high degree of retirement income security.

Pension funds administrations in developing countries are faced with increasing administrative costs affecting their capacities to offer efficient administrative services. This implies that much of the allocated amounts to the administrators are not sufficient to meet all of the expenditures; a fact that raises the question of their sustainability. In this scenario, pension fund administration in Kenya is not an exception. Mutuku (2007) indicates that among the problems faced by pension industry in Kenya are high service providers' expenses, inadequate returns, inability to meet pension promise requirements and the need for credible fund manager performance. Investment management and administrative costs can significantly increase the cost of retirement security, lower the rates of return on investments and decrease the retirement benefits (Bikker and Dreu, 2009).This is because sustainability of PFAIs depends in part on prudent management of service providers expenses. High costs of administration may lead to less income for retiring contributors and a low annual rate of return since these expenses are paid from the pension funds budgets; especially for funded schemes (Mutuku, 2007).Whitehouse (2000) reports that sustainability comprises financial sustainability, adequate management, planning, and policy making. It has however been argued that pension schemes in Kenya are poorly

managed and hence do not use minimal resources (Ambachtsheer, 2011). Weak financial management practices may lead to pension funds failure to deliver adequate retirement benefits and may also expose them to financial abuse.

Investment management is one of the financial management strategies employed by Pension Fund Administrative Institutions (PFAIs) to address on these issues. Investment management practice is the professional asset management of various securities and other assets in order to meet specified investment objectives (KRBA, 2010). Investment strategy determines the investment mix of the total funds of a retirement fund that aims at having a careful balance between investment risks and returns (Eichholtz &Margaritova, 2009). Investment strategy is therefore a plan that guides the choice of the investments that retirement funds make and by extension the returns of the funds. Risky assets (equity investments) generates higher returns compared to the less risky ones (bonds) (Bikker *et al.* 2009). According to Campbell and Viceira (2002), strategic investment decision-making results in higher returns that contribute to increased efficiency leading to the sustainability of pension systems. A good investment strategy results in more returns and lesser risks for retirement funds (Leisako, *et al.,* 2005). To achieve retirement fund efficiency, retirement funds must devise sound investment strategies and apply them consistently (Kyiv, 2003). Investment strategy determines the short-term and long-term sustainability of a retirement fund (OECD 2009). An investment strategy ensures that money is available to pay benefits and other costs as they fall due (Bikker *et al.* 2009).

This study therefore sought to assess the influence investment management practices on sustainability of pension funds administrative institutions in Kenya.

2. Methodology

2.1. Research Design

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose (Kothari & Garg, 2014). This study used correlational research design involving a quantitative method of research with two or more quantitative variables from the same group of subjects, from which a relationship was determined (or covariation) between the variables. This design was adopted so as to determine both the direction relationships among variables and also the relationships between different variables. Mugenda and Mugenda (2003) and Kothari (2004) explain that a correlational research is used to explore the relationship between variables and this is consistent with this study which seeks to establish the relationship between financial management practices and sustainability of pension funds administrative institutions.

2.2. Target population

Population is a large collection of individuals or objects that is the main focus of a scientific query. A population also refers to an entire group of individuals, events or objects having a common observable characteristic. Zikmund *et al.,*(2010) defines population as all items in any field of inquiry, also known as the universe. The target population is asserted to be the entire set of units to which the study findings will be generalized (Levy & Leme show, 2013). This study comprised of 85 pension funds administrators in Kenya as at December 2016 from which the target and accessible population was drawn. According to RBA (2017), there were 54 internal pension funds administrators (in-house) and 31 registered fund administrators in Kenya which was also be the accessible population in this study as shown in table 1.

Description	Number
In-house	54
Outsourced	31
Total	85

Table 1: Target Population
Source: RBA Data 2016

2.3. Sample and Sampling Technique

A sample design is the architecture or the strategy used to select study participants or respondents (Kothari, 2004). Sampling refers to the systematic selection of a limited number of elements out of a theoretically specified population of elements. The rationale is to draw conclusions about the entire population. According to Kothari (2004), the ultimate test of a sample design is how well it represents the characteristics of the population it purports to.

This study used a combination of stratified and simple random sampling method on all the pension funds administrative institutions. Stratified random sampling was used in each category of funds administrators to group respondents into two strata. The strati were that of in-house and externally out-sourced pension funds administrators operating in Kenya. Within each of the two strata, simple random sampling was done to identify individual respondents who were issued with a questionnaire to respond to research statements. Kothari (2004) supports random sampling as it satisfies the law of statistical regularity if a sample is chosen at random, and on average it has the same characteristics and composition as the population.

2.4. Sample Size

Sampling is the selection of a subset of individuals from within a population to yield some knowledge about the whole population, especially for the purposes of making predictions based on statistical inference (Black, 2011). The

advantages of sampling are cost, speed, accuracy and quality of the data (Ader et al., 2008). The sampling process comprises of defining the population, sampling frame, sampling method, sample size and sample plan (Lavrakas, 2008).

Cooper and Schindler (2007) recommend that a sample can be drawn from a sampling frame using a formula for determining appropriate sample from a small population. This study adopted a stratified sampling technique to select the sample size of 70 from the internal and external funds administrators from the sampling frame as at 31st December 2016. If a population from which a sample is to be drawn does not constitute a homogeneous group, stratified sampling technique is generally applied in order to obtain a representative sample (Kothari, 2004).The sample respondents were selected randomly by the researcher on the basis that the sample units selected out of the sample size was typical or representative of the whole (Kothari & Garg, 2014). In determining the sample size, Slovin's formula was used to calculate the sample size (at 95% confidence level and $\alpha = 0.05$) as indicated on Equation 1.

$$n = \frac{N}{(1+N e^2)} \quad \text{Equation 1}$$

Where, n = is the desired sample size
N = is the population size
e = margin of error (at 95% confidence level).

Simple random sampling was then used to select the sample sizes from each stratum so as to increase the samples' statistical efficiency. Table 2 shows the sample sizes and sample distribution from the strata. The sample size of 70 constituted 82.35% of the target population which was adequate based on the recommendation by Kothari (2004) who assert that a sample of at least 10% to 15% is able to lead to meaningful generalizations about the general characteristics of a study population. The target sample size was distributed within the 85 pension funds administrative institutions in the two strati using the study population ratio representation. This ensured that sample distribution is unbiased and balanced.

Description	Target Population	Sample Size
In-house FAs	54	44
Outsourced FAs	31	26
Total	85	70

Table 2: Sample Size and Sample Distribution
Source: Survey Data, 2018

2.5. Data Collection

Both primary and secondary data were collected for the purpose of this study. Primary data was collected using semi-structured questionnaire which comprised of both open and closed ended questions. This study also utilized secondary data from published reports and financial statements of the pension funds collected from the PFAIs' Website, RBA, and pension schemes.

2.5.1. Data Collection Procedure

Data was collected through administration of questionnaires in which the researcher distributed the questionnaires in person to the institutions identified for the study. The unit of analysis for this study was the fund administrator. The questionnaires were self-administered to participants who included administrators, accountants, senior managers or chief administration managers working under the administrator with delegated authority. The questionnaires were first dropped with an introductory letter of authority to carry out research to the institutions identified for the study and follow up was done through telephone and personal visits to secure appointment dates for collection of the filed questionnaires.

2.5.2. Primary Data

The primary data was collected using semi-structured questionnaire which comprised of both open and closed ended questions. Questionnaires are uniform and standardized and are less susceptible to biases due to deviations from instructions and method of administration are generally less costly, less time consuming, and considerably less demanding with respect to such matters such as selection, training, and supervision of personnel (Cooper and Schindler, 2003). A questionnaire is more preferred by respondents due to anonymity. In the current study, the questionnaire was based on a 5-point Likert scale. This scale was used to quantify responses on items in the questionnaires. The 5-point Likert scale was thus adopted for the predictor and the predicted variables so as to ensure that respondents make a definite choice rather than an inclination to a neutral response. Kothari & Garg (2014) defines a questionnaire as a document that consists of a number of questions printed or typed in a definite order on a form or set of forms, sent to persons concerned with a request to answer the questions and return the questionnaire.

According to Dawson (2002), there are three basic types of questionnaires; closed ended, open-ended or a combination of both. Closed-ended questionnaires are used to generate statistics in quantitative research while open-ended questionnaires are used in qualitative research, although some researchers will quantify the answers during the analysis stage. Obtaining data from participants with different methods and experience will help prevent information bias thus, increasing credibility regarding the information collection (Louis *et al.,* 2007). Sasaka et al.,(2014) showed that self-administered questionnaires are usually preferred for purposes of developing close relationship with the respondents and also assists in providing clarifications sought by respondents on the spot. The questions were formulated to address all the

objectives of the study and consisted of three parts: Part A focused on the respondent's demographics and part B assessed the measures of the relationship between investment management practices and sustainability of PFAIs.

2.5.3. Secondary Data

This study also utilized secondary data from published reports and financial statements of the pension funds collected from the PFAIs' Website, RBA, and pension schemes. The study reviewed secondary data for pension funds for eight (8) years from 2008 to 2016. Secondary data included total contributions, net assets available for benefits, investment returns, schemes expenditure, administrative expenses, number of active contributors and related pension funds information This data was used was used to compute the expenses ratios and trends related to performance and growth of pension funds for assessment of sustainability of PFAIs. Secondary data was used to complement information from the primary sources (Zikmund, et al., 2010).

2.6. Pilot Testing

A pilot test is done to ascertain the reliability and validity of the instrument to be used for collecting data essentially to reveal the weakness that may be in the questionnaire, for instance unclear directions, ambiguous questions and general layout. Duncan *et al*., (2015) confirms that a pilot study helps in assessing the feasibility of the study; designing a research protocol and assessing whether it is realistic; establishing the effectiveness of the sampling frame and technique; identifying logistical problems that might occur with the proposed methodology; determining resources required for the planned study for assessment of the proposed data analysis techniques to uncover potential problems

The questionnaire was pre-tested on selected PFAIs before the study started. It was essential to pre-test the questionnaire so as to increase the validity and reliability to identify any ambiguous questions in the questionnaire to establish the range of possible responses for each question. Adjustments were made based on the outcome of the pre-test results. Seven questionnaires were used for pilot study. According to Creswell (2003) and Cooper and Schindler (2011) the respondents used in pilot test should constitute 10 percent of the sample used in data collection.

2.6.1. Validity of the Instrument

Validity is the degree to which results obtained from the analysis of data actually represent the phenomenon under study (Kothari & Garg, 2014). According to Mugenda and Mugenda (2003), validity is the degree to which results obtained from the analysis of the data actually represent the phenomenon under study. This study utilised both construct validity and content validity. For construct validity, the questionnaire is divided into several sections to ensure that each section assesses information for a specific objective, and also ensures the same was guided by the conceptual framework for the study (Cooper & Schindler, 2011). Validity of the questionnaire was initially tested by reviewing it with my supervisors. The questionnaire was also validated by discussing it with two randomly selected managers of the target administrative institutions whose views were evaluated and incorporated to enhance content validity of the questionnaire.

2.6.2. Reliability of Instrument

Reliability is the extent to which an instrument is predictable, accurate and dependable to yield the same results every time it is administered (Kothari& Garg, 2014). Cronbach's alpha was used to test the reliability of the measures in the questionnaire (Cronbach, 1951). On testing the reliability of the instrument, 10% of the sample size was used as recommended by Sekaran (2003) and Kothari (2004) who stated that 5% to 10% of the sample could be adequate for running reliability tests. The reliability of the questionnaire was tested using the Cronbach's Alpha in Statistical Package for Social Sciences (SPSS) software. According to Cronbach (1951) and Sekaran (2003) the closer Cronbach's alpha coefficient is to 1, the higher the internal consistency of reliability. Cronbach (1951) as cited in Sekaran (2003) recommend Cronbach coefficient of 0.7 for a newly developed questionnaire.

2.7. Diagnostic Tests

It was essential to ensure non-violations of the assumptions of the classical linear regression model (CLRM) before attempting to estimate equation. Estimating these equations when the assumptions of the linear regression are violated runs the risk of obtaining biased, inefficient, and inconsistent parameter estimates (Brooks, 2008). Normality test, sampling adequacy, multicollinearity, and autocorrelation tests were used as diagnostic tests during this study.

2.8. Data Analysis and Presentation

Data was analysed using both descriptive and inferential statistics in SPSS. Descriptive measures such as percentages and frequencies were used to draw inferences and make conclusions. Inferential analysis was done by use of Pearson's correlation to determine the strength of the relationship between the variables and linear regression to establish the form of the relationship. The information were represented using tables.

2.9. Statistical Measurement Model

The following linear regression analysis model was used to guide the study:

$Y=\beta_0+\beta_1 X_1+\varepsilon$

Where;

Y represents sustainability of PFAIs (Dependent variable),

X_2representsinvestment management practices,

β_0, β_1, are regression coefficients to be estimated.

ε is the error term.

Analysis of variance (ANOVA) was used to test the significance of the overall model at 95% level of significance. Coefficient of correlation (R) was used to determine the strength of the relationship between the dependent and independent variables. Coefficient of determination (R^2) was also used to show the percentage for which the independent explained the change in the dependent variable. The benchmark for this study for accepting or rejecting the null hypothesis was a level of significance of 5 percent. If the p-value was less than five percent, the null hypothesis was rejected and the alternate hypothesis was accepted. Also if the p-value was greater than 5 percent the null hypothesis was accepted and the alternate hypothesis was rejected.

3. Findings and Discussion

3.1. Sample Characteristics

The study sought to determine respondent's demographic characteristics including their gender, education levels, designation, experience, type of pension administered, period taken to pay benefit claims and administrative services rendered as elaborated in table 3.

Demographic Characteristics	Frequency	% Response
Gender		
Male	34	56.7
Female	26	43.3
Level of education		
Diploma	3	5
Undergraduate Degree	34	56.7
Master Degree	23	38.3
Designation of the Respondents		
Chief Funds manager	8	13.3
Senior admin	15	25.0
Administrator	25	41.7
Business Development and Consulting	1	1.7
Manager pensions	2	3.3
Supervisor	1	1.7
Accountant	6	10.0
Actuarial analyst	1	1.7
Relationship manager	1	1.7
Chief Funds manager	8	13.3
Senior admin	15	25.0
Experience of the Respondents		
Less than 5 years	13	21.7
6-10 years	28	46.7
over 10 years	19	31.7
Types of Pension Schemes Administered		
Contributory	59	98.3
Contributory+ Non-Contributory	1	1.7
Period Taken To Pay Benefits Claims		
1-10 days	21	35.0
11-20 days	17	28.3
21-30 days	20	33.3
Over 30 days	2	3.3
Type of Administrative Services Rendered	Self-administered - 61.7%) Externally administered - 38.3%	

Table 3: Sample Characteristics

3.2. Descriptive and Qualitative Analysis on Sustainability of Pfais

In order to determine whether investment management practices had improved the sustainability of PFAIs, the respondents were requested to indicate the importance of measures of sustainability for the study. The responses were rated on a five-point Likert scale where: 1-least important, 2-Not important, 3- Somehow important, 4- Important, 5-Very important.

3.2.1. Descriptive Statistics

Sustainability was assessed by two measures namely, operational sustainability and financial sustainability. Descriptive data shown on Table 4 presents the relevant results. Responses on sustainability attracted various responses from the respondents. From the study findings, the pension funds had consistently been realising increasing investment

returns (Mean = 4.15), schemes had consistent improvement in performance of services providers (Mean = 4.15), the pension funds had increasingly complied with relevant financial reporting framework (Mean = 4.0833) and the PFAIS had been experienced decreasing administrative cost in the past (Mean = 4.0333). Majority of the respondents agreed (mean = 4) that all the four factors were considered as appropriate measures of sustainability of PFAIs in Kenya.

	N	Mini	Max	Mean	Std.Dev
1. Our institution has been experiencing decreasing administrative cost in the past	60	2.00	5.00	4.0333	.82270
2. The pension funds have consistently been realising increasing investment returns	60	2.00	5.00	4.1500	.79883
3. There has been consistent improvement in performance of services providers in the pension funds	60	3.00	5.00	4.1500	.65935
4. Pension funds have increasingly complied with relevant financial reporting framework	60	1.00	5.00	4.0833	.73857

Table 4: Descriptive Statistics on Sustainability of Pfais

Key: 1= Very Low Extent, 2=Low Extent, 3 = Somehow, 4 = Great Extent, 5 = Very Great Extent

3.2.2. Sampling Adequacy for Sustainability

To examine whether the data collected on sustainability was adequate and appropriate for inferential statistical tests such as the factor analysis, regression analysis and other statistical tests, two main tests were performed namely; Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity. For a data set to be regarded as adequate and appropriate for statistical analysis, the value of KMO should be greater than 0.5 (Field, 2000) as summarized in Table 5. The findings showed that the KMO statistic was 0.676 which was significantly high; that is greater than the critical level of significance of the test which was set at 0.5 (Field, 2000). In addition to the KMO test, the Bartlett's Test of Sphericity was also highly significant (Chi-square = 27.202 with 6 degrees of freedom, at $p < 0.05$). These results provide an excellent justification for further statistical analysis to be conducted.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.676
Bartlett's Test of Sphericity	Approx. Chi-Square	27.202
	df	6
	Sig.	.000

Table 5: Sampling Adequacy for Sustainability KMO and Bartlett's Test

3.2.3. Factor Analysis on Sustainability of PFAIs

Factor analysis is used to produce a small number of factors from a large number of variables which is capable of explaining the observed variance in the larger number of variables (Theuri *et al*., 2015). According to Bartholomew *et al.,* (2011), factor analysis works on the fact that measurable and observable variables can be reduced to fewer latent variables that share a common variance and are unobservable, which is known as reducing dimensionality. The broad purpose of factor analysis is to summarize data so that relationships and patterns can easily be interpreted and understood. It is normally used to regroup variables into a limited set of clusters based on shared variance (Yong & Pearce, 2013). Table 6 shows the variance explained for sustainability which is the dependent variable where constructs were subjected to a variance test through the principal component analysis test for data reduction and interpretation of the data.

Sustainability was assessed by two measures namely; operational sustainability and financial sustainability and four constructs were tested for factor analysis. Factor analysis was conducted after successful testing of sampling adequacy and reliability using KMO coefficient and Cronbach alpha results. The extraction of the factors followed the Kaiser Criterion where an Eigen value of 1 or more indicates a unique factor. Total Variance analysis indicates that the 4 statements on sustainability can be factored into 1 factor. The component identified to have the highest influence was the consistent improvement in the performance of services providers which had Eigen value greater than 1 and explained52.61 % in this construct. This was therefore used as a main factor explaining more on sustainability of PFAIs in Kenya.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.105	52.613	52.613	2.105	52.613	52.613
2	.805	20.131	72.744			
3	.674	16.855	89.599			
4	.416	10.401	100.000			

Table 6: Total Variance Explained on Sustainability
Extraction Method: Principal Component Analysis.
Source: Survey Data, 2018

Table 7 shows the factor loadings for sustainability statements on rotated component matrix. All the four factors attracted had coefficients of more than 0.4 hence all the statements were retained for analysis. According to Rahn (2010) a factor loading equal to or greater than 0.4 is considered adequate.

	Component
	Financial sustainability
1. Decreasing administrative cost	.695
2. Increasing investment returns	.787
3. Improved performance of services providers	.795
4. Compliance with financial reporting framework	.608

Table 7: Rotated Component Matrix on Sustainability of Pfais
Extraction Method: Principal Component Analysis.
a.1 Components Extracted
Source: Survey Data, 2018

3.2. Descriptive and Qualitative Analysis on Investment Management Practices

3.2.1. Descriptive Analysis on Investment Management Practice

Investment management practice was assessed by two measures namely investment strategies and investment guidelines. Descriptive data shown on table 8 presents the relevant results on a scale of 1 to 5 (where 5 = Very great extent and 1 = very low extent). From the study findings, majority of the respondents agreed that the schemes maintained statutory compliant investment policy statements (IPS) (mean = 4.8000), that the schemes gave total investment discretion to fund managers within IPS guidelines (mean = 4.6000), that the schemes consistently diversified assets investments within RBA investment guidelines (mean = 4.5833), that the schemes consistently made investment choices compliant with IPS (mean = 4.4167), that the schemes consistently used professional investment advisors in investment decisions (mean= 4.3333), that the schemes continuously monitored fund manager's adherence to the IPS (mean = 4.3167), that the schemes regularly carried out investment performance appraisal (mean = 4.0833), and that the schemes reliably used investment risk management policy (mean = 3.9667). The respondents seemed to agree (mean = 4 and strongly agree, mean = 5) with almost all investment management practice measures as being incorporated in pension funds investment decision making. Osano (2013) study concluded that investment strategies have a positive influence on investment funds performance. The findings also concur with Mutula & Kagiri (2018) studies that revealed that investment strategies determine the returns from investment.

	N	Min	Max	Mean	Std Dev
1. The schemes maintain statutory compliant investment policy statements (IPS)	60	3.00	5.00	4.8000	.48011
2. The schemesgives total investment discretion to fund managers within IPS guidelines.	60	2.00	5.00	4.6000	.66892
3. The schemes reliably use investment risk management policy	60	1.00	5.00	3.9667	.91996
4. The schemes regularly carries out investment performance appraisal	60	2.00	5.00	4.0833	.88857
5. The Schemes consistently diversify assets investment within RBA investment guidelines	60	4.00	5.00	4.5833	.49717
6. The schemes consistently make investment choices compliant with IPS	60	2.00	5.00	4.4167	.64550
7. The schemes consistently uses professional investment advisors in investment decisions	60	3.00	5.00	4.3333	.62887
8. The schemes continuously monitor fund manager's adherence to the IPS	60	2.00	5.00	4.3167	.77002

Table 8: Descriptive Statistics on Investment Management Practice
Key: 1= Very Low Extent, 2=Low Extent, 3 = Somehow, 4 = Great Extent, 5 = Very Great Extent.
Source: Survey Data, 2018

3.2.2. Sampling Adequacy on Investment Management Practices

To examine whether the data collected on investment management practice was adequate and appropriate for inferential statistical tests such as the factor analysis, regression analysis and other statistical tests, two main tests were performed namely; Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity. For a data set to be regarded as adequate and appropriate for statistical analysis, the value of KMO should be greater than 0.5 (Field, 2000) as summarized in Table 9. The results showed that the KMO statistic was 0.765 which was significantly high; that is greater than the critical level of significance of the test which was set at 0.5 (Field, 2000). Bartlett's Test of Sphericity was also highly significant (Chi-square = 228.717 with 28 degrees of freedom, at $p < 0.05$). These results provided an excellent justification for further statistical analysis to be conducted.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		**.765**
Bartlett's Test of Sphericity	Approx. Chi-Square	228.717
	Df	28
	Sig.	.000

Table 9: KMO and Bartlett's Test for Investment Management Practice

3.2.3. Factor Analysis Results on Investment Management Practice

Factor analysis was done on investment management practice variables where constructs were subjected to a variance tests through the principal component analysis test. Investment Management practice was assessed by two measures namely; investment strategies and investment guidelines and eight constructs were tested for factor analysis. Through factor analysis, out of the eight factors that were considered to be measuring investment management practice, the results showed that only two had their Eigen values greater than 1 with a cumulative 67.7% of the total variance. Factor 1 contributed the highest variation of 52.20% (Eigen value 4.176), while factor 2 contributed 15.52% (Eigen value 4.176) of the total variation. Therefore, the components identified to have the highest influence were that the schemes consistently made investment choices compliant with IPS and gave total investment discretion to fund managers within IPS. These two factors had their Eigen values greater than 1 and had the greatest influence on sustainability as shown in table 10. Their contributions decreased as one moves from one factor to the other up to factor 2. These were therefore used as the main factors explaining investment management practice.

Component	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.176	52.199	52.199	4.176	52.199	52.199
2	1.241	15.515	67.714	1.241	15.515	67.714
3	.878	10.978	78.692			
4	.483	6.042	84.733			
5	.472	5.899	90.633			
6	.300	3.756	94.389			
7	.278	3.472	97.861			
8	.171	2.139	100.000			

Table 10: Total Variance Explained on Investment Management Practice
Source: Survey Data, 2018
Extraction Method: Principal Component Analysis

Rotated component matrix was also carried out on investment management practice. From the results, all the investment management practice variables had a factor loading of higher than 0.4 (table 11). Therefore, the component values indicate that they are highly interrelated with each other.

	1 =IS	**2=IG**
1. The schemes maintain statutory compliant investment policy statements (IPS)	.687	
2. The schemes gives total investment discretion to fund managers within IPS guidelines.		.768
3. The schemes reliably use investment risk management policy	.713	
4. The schemes regularly carries out investment performance appraisal	.833	
5. The Schemes consistently diversify assets investment within RBA investment guidelines	.565	
6. The schemes consistently make investment choices compliant with IPS	.868	
7. The schemes consistently uses professional investment advisors in investment decisions	.730	
8. The schemes continuously monitor fund manager's adherence to the IPS	.813	

Table 11: Rotated Component Matrix on Investment Management Practice
Key: IS = Investment Strategies, IG = Investment Guidelines
Extraction Method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalization
Source: Survey Data, 2018

3.2.4. Normality Tests on Investment Management Practice

Normality test was done to test for significance of confidence interval estimates of the parameter variables which were assumed to be normally distributed. In their study, Ali *et al*. (2016), showed that the assumptions and application of statistical tools as well as suitability of the tests were important aspects for statistical analysis. To check for normality, the study adopted the skewness and kurtosis tests in which measures of skewness was based on mean and median while kurtosis measured the peaked-ness of the curve of the frequency distribution (Kothari & Garg, 2014).

Investment management practice had a skewness coefficient of -0.380 and kurtosis coefficient of -0.827 (Table 12). According to George & Mallery (2010), values for asymmetry and kurtosis lying between -2 and +2 are considered acceptable in order to prove normal distribution. All the statistical values for both skewness and kurtosis were within the recommended range. Based on these results therefore, it was concluded that the data was normally distributed since their statistical values were between -2 and +2.

	N	Minimum	Maximum	Mean	Std. Dev	Skewness		Kurtosis	
	Statisti	Statisti	Statisti	Statisti	Statisti	Statisti	Std. Error	Statisti	Std. Error
Investment management practices	60	3.00	5.00	4.4500	.56524	-.380	.309	-.827	.608

Table 12: Normality Tests on Investment Management Practice
Source: Author, 2018

3.2.4.1. Hypothesis Testing

The objective of this study was to evaluate the influence of investment management practice on sustainability of PFAIs in Kenya. The stated hypothesis that Investment management practice does not have a significant influence on sustainability of PFAIs in Kenya was tested using inferential statistics as elaborate in sub- sections 3.4.1 and 3.4.2.

3.2.5. Correlation Analysis

Correlation analysis was used to establish the strength and the nature of the relationship between investment management practice measures (investment strategy and investment guidelines), and financial sustainability (operational sustainability and financial sustainability) of PFAIs in Kenya. Table 13 shows the results of the correlation analysis with varied degree of interrelationship between investment management practice and sustainability of PFAIs.

The Pearson correlation coefficient was generated at 0.05 significance level (2-tailed). Correlation analysis results shows a positive significant correlation ($r = 0.448$; $p<0.05$) indicating that sustainability increases with increase in investment management practice of pension funds. The findings are in conformity with Mugambi (2014) study which revealed a Pearson coefficient of 0.780 and p-value of 0.000 with a strong, significant, positive relationship between property investment and growth of pension funds in Kenya. Kyanda (2014) also established that the fund had increased its reliance on relevant professional advisors in making investment decisions that led to improved returns. The findings are also in agreement with Namusonge *et al*., (2017) who found out that Asset mix had a positive influence (r= 0.813) on the financial performance of occupational pension schemes in Kenya.

	Investment Management practice (X_1)	Financial Sustainability
Investment Management practices X_1	.314*	.061
	.015	.641
	60	60
Financial sustainability	.448**	1
	.000	
	60	60

Table 13: Correlation Analysis - Investment Management Practice and Sustainability of Pfais
**. Correlation Is Significant at the 0.05 Level (2-Tailed)*
Source: Survey Data, 2018

3.2.6. Regression Analysis

To establish the influence of investment management practice (that is, investment strategies and investment guidelines) on sustainability of PFAIs in Kenya, the following hypothesis was tested: $H0_1$: Investment management practice does not have a significant influence on sustainability of PFAIs in Kenya. Regression analysis was conducted to empirically determine whether investment management practice measures had any significant influence on the sustainability of PFAIs in Kenya.

Results in Table 14shows that investment management practice measures (investment strategies and investment guidelines) had explanatory power on financial sustainability as it accounted for 20.8% of its variability ($r^2= 0.208$) as indicated in the model. This indicates that investment management practice explains about 20.8% of the variations observed in sustainability among PFAIs in Kenya. This therefore led to the rejection of the null hypothesis and instead stated that investment management practice significantly influenced sustainability of PFAIs in Kenya. Thus, higher levels of investment management practice in pension funds are associated with increased sustainability of PFAIs.

The findings are in line with Mutula (2018) who showed that the investment strategies explain 78.1% of the total variations in the investment performance of pension funds in Kenya. Namusonge et al.,(2017) in a similar study found out that Asset mix has an immense positive influence on the financial performance of occupational pension schemes in Kenya. From their study findings the coefficient of determination (r^2) value was 0.661 meaning that 66.1% of the variation in financial performance of pension schemes could be explained by the independent variable which was the asset mix. Blake et.al., (2004) also reported that key differences between outcomes depend on the strategic asset allocation strategy chosen.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.456[a]	.208	.180	.59712

Table 14: Model Summary - Investment Management Practice on Sustainability
a. Predictors: (Constant), Investment Management Practice

Similarly, Lumby & Steve (2011) established that when risks are well controlled through wise and prudent selection of investment opportunities such as financial assets and other properties, the pension scheme performance improves tremendously.

Anova results in table 15shows a significant relationship between investment management practice and financial sustainability (F = 7.470, p = 0.01) of PFAIs. This indicates that the model is statistically significant (p< 0.05) and that investment management practice has a positive significant influence on sustainability of PFAIs in Kenya.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.327	2	2.663	7.470	.001[a]
	Residual	20.323	57	.357		
	Total	25.650	59			

Table 15: ANOVA Results on Investment Management Practice
a. Predictors: (Constant), Investment Management Practice
b. Dependent Variable: Sustainability of Pfais
Source: Survey Data, 2018

Kieslowski*et al.,* (2006) found that some growth-oriented mutual fund managers earned positive abnormal returns due to genuine skill rather than good luck. Chen *et al.,* (2010) showed that superior growth-oriented fund managers had growth timing abilities revealing that growth timing accounted for about half of the abnormal returns. The study further determined that investment performance had improved over the years with benefits paid to members and investment returns reported having improved and being above the average returns as reported by industry surveys.

Table 16 displays the regression coefficients results of the investment management practice measures (β= 0.476, p-value = 0.000) which were statistically significant in explaining sustainability of PFAIs in Kenya. This implies that the more the investment management practice, the greater the sustainability as measured by operational sustainability and financial sustainability. The model connecting financial sustainability of pension fund institutions therefore becomes $Y= 2.403 + 0.486X_1$. The constant term implied that at zero investment management practice, sustainability of PFAIs in Kenya performs at 2.403 units. The coefficient 0.486 implies that improvement in funding management practice by one unit increases sustainability by 0.486 units.

Model		Unstandardized Coefficients	Standardized Coefficients		t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.403	.662		3.627	.001
	Investment management practice (X_1)	.486	.127	.476	3.830	.000

Table 16: Regression Coefficients on Investment Management Practices and Sustainability of Pfais
Dependent Variable: Sustainability of Pfais
Source: Survey Data, 2018

4. Conclusion

From the findings of this study, it is concluded that investment management practices positively and significantly influence the operational and financial sustainability of PFAIs in Kenya (r^2 = 0.208; p<0.05). This implies that 20.8% of the variation observed in the operational and financial sustainability of PFAIs in Kenya in explained by investment management practices.

5. Recommendations

To increase on both financial and operational sustainability of pension funds administration institutions, pension funds boards of trustees should consistently review investment strategies and investment guidelines. This should be in a view to enhancing investment choices that are fully compliant with the investment policy statements (IPS) and also ensure that they always give total investment discretion to fund managers within IPS guidelines.

6. References

i. AdèrH.J, J.G, &HandD.J (2008). Advising on Research Methods: a consultant companion, Netherlands.
ii. Adongo, J., & Stork, C. (2006). Factors Influencing the Financial Sustainability of Selected Microfinance Institutions in Namibia. The Namibian Economic Policy research Unit (NEPRU) (No. 39). Research Report.
iii. Ali, C. A. & Akayuure, P. (2016).Exploring Postgraduate Students' Research Knowledge and Skills in Normality Tests and Verifications. US-China Education Review. 6(1), 53-60.
iv. Ambachtsheer, K. (2007). The three grades of pension fund governance quality: bad, better and best. OECD Publishing.
v. Bartholomew, D., Knotts, M., & Moustaki, I. (2011).Latent variable models and factor analysis: A unified approach. (3rded.). West Sussex, UK: John Wiley & Sons.
vi. Bikker, J. & Dreu, J. (2009). Operating Costs of Pension Funds: The impact of scale, governance and plan design. Journal of Pension Economics and Finance. (8)63- 89.
vii. Billig, A.; Ménard, J.C. (2013).Actuarial balance sheets as a tool to assess the sustainability of social security pension systems. Int. Soc. Secur. 66, 31–52.
viii. Blake, D., Cairns, A., and Dowd, K. (2004). The Impact of Occupation and Gender on Pensions from Defined Contribution Plans, Pensions Institute Paper, Cass Business School.
ix. Brooks C (2008). Introductory econometrics for finance, 2ed. New York, Cambridge University Press,
x. Campbell, J. Y., & Viceira, L. M. (2002). Strategic asset allocation: portfolio choice for long-term investors. Oxford University Press, USA.
xi. Chadwick, D.G.; Wilson, M.B.; Anderson, C.F (2014). Shaping oral health care in North Carolina with East Carolina University's community service learning centers. North Carol. Med. J. 75, 36–38.
xii. Chen, L.W., Adams, A. & Taffler, R. (2010). What Skills do Star Fund Managers Possess? Working Paper, University of Edinburgh.
xiii. Cooper, D. R., & Schindler, P. S. (2011). Business Research Methods (9th ed.). New Delhi: McGraw-Hill Publishing, Co. Ltd.
xiv. Creswell, J. W. (2003). Research design: qualitative, quantitative, and mixed methods approaches. (CA, Ed.) (2nd ed.). Sage Publications.
xv. Cronbach, L. J. (1951). Coefficient alpha and the international structure of tests. Psychometrica, 16, 297-334.
xvi. Dawson, C. (2002). Practical Research Methods: A user friendly guide to research. How to Books Ltd, 3 Newtec Place, United Kingdom.
xvii. Duncan N., Agnes N., Member F.,&Tirimba O. (2015). Effect of Cash management on Financial Performance of Deposit Taking Saccos in Mount Kenya Region. International Journal of Scientific and Research Publications, 5(2), 1-7.
xviii. George, D., & Mallery, P. (2010). SPSS for Windows step by step. A simple study guide and reference (10. Baskı).
xix. Kosowski, R., Timmerman, A., White, H., & Wermers, R. (2005). Can Mutual Fund "Stars"
xx. Kothari, C. R. (2004). Research methodology and techniques. (2nd ed). New Delhi: New Age Int.
xxi. Kothari, C., & Garg, G., (2014).Research Methodology. New Delhi: New Age International (P) Ltd. Publishers.
xxii. Kyanda, H. K. (2014). Corporate Governance As a Strategy to Improve Performance in Pension Funds: A Survey of Kenya Power Pension Fund (Doctoral dissertation, United States International University-Africa).
xxiii. Kyiv. (2003). Pension Investment Regulation: Collection of Data and Recommendations. USAID.
xxiv. Leisako, T., Mitchell, O. & Piggot, J. (2005). Strategic Asset Allocation in Japan: An Empirical Evaluation. Pension Research Council. PRC WP 2005-1.
xxv. Levy, P. S., & Lemeshow, S. (2013).Sampling of populations: methods and applications. John Wiley & Sons.
xxvi. Louis, C., Lawrence, M., & Morrison, K. (2007). Research Methods in Education, 6thedition. Routledge, New York, United States of America.
xxvii. Mugambi, M. P. (2014). The Effect of Property Investment on Asset Growth of Pension Funds in Kenya. Unpublished MBA Project, University of Nairobi.
xxviii. Mugenda, O. M. Mugenda. AG (2003). Research Methods, Qualitative and Quantitative Approaches.
xxix. Mutuku, N. (2006). The trends and challenges for pension schemes. Research Paper RBA presented at Maseno University, Kenya.
xxx. Mutula & Kagiri (2018). Determinants Influencing Pension Fund Investment Performance in Kenya. International Journal of Finance, 3(2).
xxxi. Namusonge, G. S., Sakwa, W. W., & Gathogo, G. M. (2017). Impact of Asset Mix on Financial Performance of Registered Occupational Pension Schemes. International Journal of Innovative Research and Development, 6(8).
xxxii. Navajas, S. (2000). Microcredit and the Poorest of the Poor: Theory and Evidence from Bolivia. World Development, 28(2), pp. 333-346.
xxxiii. Nidumolu, R., Prahalad, C.K., Rangaswami, M.R., (2009). Why sustainability is now the key driver of innovation. Harv. Bus. Rev. 87, 25 34
xxxiv. OECD. (2009). Pension Fund Governance, Investment Strategies, and their Role in Corporate Governance. OECD Publishing.
xxxv. Osano, B. O. (2013). The Effect of Investment Strategies on Financial Performance of Investment Funds in Kenya. Unpublished Thesis (University of Nairobi 2013)
xxxvi. RBA Quarterly reports 2010. Available: http://www.rba.go.ke

xxxvii. RBA Quarterly reports 2017. Available: http://www.rba.go.ke
xxxviii. Sasaka, P., Namusonge, G., & Sakwa, M., (2014). Effects of Strategic Management Practices on Corporate Social Responsibility Performance of Parastatals In Kenya. European Journal of Business and Innovation Research, 2(1), 106- 128.
xxxix. Sekaran, U. (2003). Research Methods for Business: A Skill Building Approach. (4th edn.). India: wiley.
xl. Stock J, Speh T, Shear H. (2006). Managing product returns for competitive advantage. MITS loan Management Review pp 48(1):57–62.
xli. Theuri, S., Mugambi, F. & Namusonge, G. (2015). Strategic Management Determinants of Value Addition of Industrial Fish Processors in the Sea Food Processing.
xlii. Tijjani, M. (2014). Determinants of financial sustainability of pension fund administrators in Nigeria. Ahmadu Bello University.
xliii. Whitehouse. (2000).Paying for pensions: An international comparison of administrative charges in funded retirement-income systems. London: Financial Services Authority.
xliv. Zikmund, G. W., Babin, B. J., Carr, C. J., & Griffin, M. (2010). Business research methods (8th ed.). South-Western, Cengage Learning.