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Assets Holding and Financial Performance of Pension Fund Administrators in Nigeria

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Abstract: Pension funds are established to guarantee that contributors get a monthly or lump amount of income upon retirement. The financial performance of pension funds in Nigeria appears to be riddled with uncertainty, risk, and delays in the distribution of the benefits, creating concerns about their ability to meet its main goal. Pension Fund Managers in Nigeria were subjected to this research in order to determine the link among assets held and financial organizational performance. A total of 21 PFAs were investigated as part of this investigation, which used judgmental sampling. Secondary data from PFAs was used in the research. Specifically, the information gathered refers to investments in asset classes, and the investment reports on dividends, interest, and rental revenue. The data was evaluated using correlational statistics to assess whether or not there is a statistically significant difference between the asset classes and the components of investment income in question. Assessments of the relationship between the composition of the various pension fund portfolios and the amount of the various asset classes in relation to the amount of investment income earned were also carried out in order to determine whether diversification of the portfolio has an impact on the financial performance of the pension funds. According to the findings of the study, the accumulation of assets by the PFAs has an impact on the financial performance of the pension funds. From the findings of this study, it is obvious that the assets held by PFAs are favorably and statistically relevant in terms of their financial

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performance. Consequently, it is vital for PFAs to assess the asset mix in the fund management process to avoid over-exposure to any one asset.

Keywords: Assets holding; financial performance; pension fund administrators

JEL Classification: L25; J32; G12

1. Introduction

According to Organization for Economic Cooperation and Development (OECD) report of 2015, United States, the United Kingdom, Australia, Canada and the Netherlands, altogether total whopping sum of USD 21.7 trillion in terms of pension funds' assets. Pension Fund Management is critical and important practice in developed countries. Key problems on pension fund managers are the misallocation of its fund to various assets in such a way that hinders attainment of optimal balance in growth, profits, cash flows and overall corporate risk. Universally, pension fund managers constantly face assets holding decision making and optimization of financial performance of classes of assets holding to provide good results.

According to data and report released by National Pension Commission (PENCOM) the total pension fund assets has grown to about ₦13trillion but the country is yet to have best managed pension schemes that are financially viable with good profitability and sustainability indicators (PENCOM Annual Report, 2020). In year 2020 Pension annual reports, the commission observed huge exposure to Federal Government Bonds and Treasury Bills relative to other assets held by pension fund administrators. Also, delay in payment of retirement benefit and portfolio investment concentration especially in the period of meltdown of economic meltdown were reported.

Assets holding reveal the proportion of various elements or classes of a company's assets which it utilizes to finance its operations in order to grow revenues and generate incomes (Gladys & Omagwa, 2017). Pension funds are a kind of fund that develops over the course of an employee's working years and is used to provide retirement benefits to the employee during his or her nonworking years. Pension funds invest their money in securities in accordance with a set of investment goals that have been established (treasury bills, corporate stocks and bonds), real estate. Effective evaluation of financial performance, worldwide, is based on growth and incomes (Morales, 2017). Operating efficiency of pension management is a product of assets productivity in generating investment income. Thus, generation of investment income is a vital financial performance measurement benchmark in fund management (Pandey, 2010).

Basically, the research question to be answered in this study is "what kind of relationship occurs between the classes of assets investment holding and financial performance of the pension fund". Broadly, the intent of this study is to investigate

the relationship between assets holding and financial performance of the pension fund administrators in Nigeria. More specifically, to investigate whether there is statistical significant relationship between asset holdings and investment income of pension fund administrators in Nigeria; to evaluate the relationship between investment in ordinary share and investment income of pension fund administrators in Nigeria; to assess whether investment in Federal Government of Nigeria (FGN) securities is significantly correlated with investment income of pension fund administrators in Nigeria; to find out whether there is statistical significant relationship between investment in real estate properties and investment income of the pension fund administrators in Nigeria and to determine the relationship between investment in corporate debt securities and investment income of pension fund administrators in Nigeria.

This research is important to pensioners with respect to ensuring prompt payment of pension, security of pension fund assets, ensuring sound and sustainable growth survival by pension fund administrators and fair return on investments. Moreover, the study served as management tools for pension fund administrators and regulators to ensure a safe and sound pension industry. Generally, the research made practical policy recommendations that ensure responsible corporate organization and environmentally friendly pension fund administrators and finally, it adds to academic body of knowledge.

2. Literature Review and Hypothesis Development

2.1. Conceptual Review

2.1.1. Assets Holding

According to Sharpe (1992), asset holding is essentially a collection of two or more securities of an asset; that is, the numerous asset classes in which the financial manager has made an investment. The bottom line is that financial managers are continually striving to attain optimum asset holding in order to maintain the greater growth in the volume of business and profitability of their respective companies (Abata, 2014).

An investor who holds a portfolio of fixed income securities until the maturity date does not have to worry about the amount of interest income he will get (Pandey, 2010). For a portfolio of common stocks, however, it will be difficult to estimate the value of the portfolio at any point in the foreseeable future. Overexposure may result from concentrating all of one's capital on a single investment class. The three major asset types through which an investor might diversify his or her assets are stocks, bonds, and real estate (property) (Pandey, 2010). Bonds have the lowest risk, while

stocks carry the biggest risk, with real estate investments falling somewhere in the middle.

2.1.2. Financial Performance

Performance is a subjective measure of how well a firm can use assets from its primary mode of business and generate revenues. Common examples of financial performance include investment income, operating income, earnings before interest and taxes, and net asset value. In order to evaluate the choices that investors make as part of the process of building their investment plan, it is essential that financial performance assessment be performed on a consistent basis. A strong performance assessment system will, as a result, make an effort to provide answers to queries such as: what investment income has been generated? What is the relationship between this investment income and other portfolios and assets? Is it possible to produce effective and efficient financial performance on a consistent basis from one period to the next?

The investment income produced by a pension fund is a significant indicator of the financial success of the fund. The different assets in the portfolio create this investment income, which is credited to the account. According to Chandra (2009), the pension fund is responsible for specifying the asset allocation, which means that the pension fund must determine how much of the acquisition of investment vehicles should be allocated to each of the following asset categories: bonds, stocks, real estate, mutual funds, trust funds, and other types of investments.

When evaluating investments, pension funds take into account a number of factors, including investment income, capital appreciation, and the overall safety of the assets. Purchasing inexpensive stocks and trying to sell overpriced equities, as well as sealing in profits on interest-bearing assets such as bonds and debt instruments. Major financial miscalculation by pension funds manager are insufficient and vague assessment of returns and risk, vaguely, inexperienced extrapolation of the past performance, hasty investment decision making rather than on systematic evaluation of portfolio (Chandra, 2009).

Benefits, contributions, and asset allocation are all critical components of a pension fund administrator's financial stability, and they are listed below (investment). These fundamentals are interdependent on one another. If the asset allocation of a pension fund generates insufficient investment income, the regular or lump sum payouts may not be postponed without a corresponding rise in recipients' contribution levels. So the stability of social security is dependent on all three of these factors. A pension fund's solvency must be maintained by the generation of expected investment earnings that equal or surpass the benefits paid out. This implies that contributions plus investment returns must equal or exceed the benefits.

2.1.3. Assets and Financial Performance

The success of pension funds' portfolios is assessed by their reported investment income (Yang & Mitchell, 2005). Having a high level of investment income is desired since it allows the pension fund to retain enough and suitable levels of funds. A key point has been made on the need of efficient pension fund asset holding, which should maximize investment income while being properly well financed. According to O'Neill (2007), excellent investment returns are essential for ensuring that pension payments are sustainable in the long run.

Grinblatt and Titman (1993) developed a theory of financial performance evaluation that was based on the makeup of the portfolio. Based on the analysis of changes in the composition of the portfolio, this metric is used to assess risk. According to many assumptions about investor risk aversion, rationality, and preference (among others), investors view each investment choice to be represented by a probability distribution of projected returns on investment over the asset holding time (or the asset holding duration). In their paper, Grinblatt and Titman (1993) argue that the theory based on levels of holdings contains significant information about future fund returns above and beyond alpha, and that most of the information contained in alpha is already contained in the measure based on levels of holdings (as opposed to alpha alone).

Cohen, Coval, and Pastor (2005) build on the work of Grinblatt and Titman (1993) and develop a performance evaluation method in which a financial manager's expertise is assessed by the extent to which the manager's investment decisions are similar to the decisions of managers with excellent performance histories (i.e., managers with excellent performance histories). They proposed two performance metrics that take into account previous returns and holdings of different funds in order to evaluate the performance of a fund in the future. The first metric is based on the level of holdings, while the second metric is based on the change in holdings over time.

The assets held in this research include stocks, bonds, debentures, real estate, cash, and other assets, among other things. The financial management of pension systems should be successful in order to improve the investment income in order to ensure the long-term viability of all stakeholders in the retirement benefits system. However, it is unclear if the selection of assets in a portfolio has an impact on the performance of the pension fund in question.

2.2. Theoretical Review

2.2.1. Modern Portfolio Theory (MPT)

MPT (Modern Portfolio Theory) was initially created by Markowitz in 1952, and it was a financial model that proved the benefits of a well-diversified portfolio. In the choice to invest in assets or securities that are subject to risk, the portfolio theory gives a normative approach to investors. According to MPT, the age-old saying "Don't put all your eggs in one basket" is correct. The portfolio theory supported diversification by calculating the value of diversity in terms of anticipated returns and risk exposures. But in the end, no matter how many assets you have, there is no way to guarantee that all risks will be avoided. Generally speaking, all assets are influenced by macroeconomic conditions that are widespread.

Consequently, Markowitz was the first to mathematically demonstrate that it was a matter of deciding how many eggs to place in which basket. Assuming that an investor is both rational and risk averse, portfolio theory predicts that the investor will select the portfolio that provides the highest returns for a given level of risk, and as a result, the investor will have a variety of options for the assets that will be included in the portfolio. Risk and reward are inherent in all investing options. When assets in a portfolio are merged, they form a "efficient frontier" portfolio, which Markowitz demonstrated should be followed by investors in order to maximize returns.

2.3. Empirical Review

Pension funds' financial performance in Kenya was investigated by Njeru, Njeru, and Kasomi (2015), who investigated the relationship between their portfolio holdings and financial performance. 1 262 pension funds in Kenya were polled for the research. In order to conduct this research, a sample of 35 pension funds was chosen. Secondary data was obtained from pension fund administrators for the research. Pension fund financial reports, including those pertaining to the pension fund portfolio, investment reports, and audited financial statements are used to compile this information. Utilizing Spearman's rank correlation coefficients of correlation, the researchers attempted to determine and evaluate if there is a statistically significant relationship between portfolio holdings and financial performance. A statistical inference was made from the data in order to establish whether or not there is a statistically significant difference between the asset categories. Results show that there was no statistically significant relationship between fixed income allocation and returns at three-month intervals, one-year intervals, and three years intervals. There was a statistically significant negative link between the allocation and the returns after one year, but there was none after three

months or three years in the case of common stocks. When it came to returns on offshore investments, there was just a slight positive correlation.

On the financial performance of pension funds, Kiplagat (2014) conducted a study to determine the influence of asset allocation. A linear positive relationship between fund performance and the weightiness of asset classes was discovered by the researchers, with the strongest correlation found between fund performance and the asset weights of cash and cash equivalents, quoted ordinary shares, government bonds, and real property. According to the findings of the research, financial policy preferences and variances in the asset combination of the different funds account for 58 percent of the variability in fund performance between the funds studied. In addition to the manager's selection, the timing of investments, and the selection of securities within an asset class, the remaining 42 percent is related to other variables.

According to Namusonge, Sakwa, and Gathogo (2017), the influence of asset structure on the financial performance of registered occupational pension systems has been investigated. An enormously favorable impact on the financial performance of occupational pension systems was revealed by the researchers via their research. According to the findings of the study, the independent variable (asset structure) demonstrated that the explanatory variable could predict 66.1 percent of the variance in the financial performance of pension plans. This research offered a significant addition to investment strategy, but it did not examine the impact of asset structure on the long-term viability of pension fund organizations, which was a significant oversight.

Alternative investments and the financial performance of pension funds were the subject of a study conducted by Mungai (2017). Private equity, real estate, investment trusts, venture capital, and bonds were among the alternative options available. As a result, it was determined that the vast majority of pension schemes had the bulk of their assets allocated to fixed income and government securities, as well as quoted equities, with just a small portion of their assets allocated to private equity, venture capital, and REITs. A positive and substantial association was found to exist between the financial success of pension funds and all alternative investments, with the exception of venture capital and private equity. A mutual fund was not included in the study, and the time span covered was just a few years, not more than five. Unlike other types of labor, this one did not concentrate on investment earnings.

As stated in Gladys and Omagwa (2017), they attempted to determine the relationship between asset mix and financial performance of companies listed on the Kenyan Stock Exchange in the commercial and service sector. The secondary data from the annual reports of the publicly traded corporations served as the study's sample population.... It is examined in terms of property, plants, and equipment; current assets; intangible assets; and long-term investments and finances, which

served as the explanatory variables in this investigation. This study's primary outcome variable was financial success, which was proxied by a composite index that included measures such as: productivity, turnover, and sales volume. From 2010 to 2014, a census was conducted on all of the businesses classified as belonging to this commercial and service sector. The survey covered a five-year period from 2010 to 2014. According to the findings of the study, asset mix had a statistically significant impact on the financial performance of the company. In particular, the study discovered that: property, plants, and equipment, as well as long-term investments and funds, have a statistically significant effect on financial performance, whereas current assets and intangible assets do not have a statistically significant effect on financial performance, according to the results of the research. According to the findings of this research, businesses should raise their allocation of resources to long-term investments and funding, as well as use more resources in terms of property, plant, and equipment in an effective manner.

In recent years, the role of assets in creating value for businesses has prompted a considerable deal of research into various aspects of assets in both developed and emerging economies. The asset structure and performance assumptions are supported by a substantial amount of actual data. However, most of results of empirical studies on the subject were varied. Not only that, but their methodologies were different. Again, none of these prior studies try to find out the possible linkage between investment in assets and investment income Njeru, Njeru and Kasomi (2015); Kiplagat (2014) Namusonge, Sakwa and Gathogo (2017) Mungai (2017); Empirical studies indicate that a balanced assets holding can create a lot of synergistic values (i.e. it can translate to pension contribution-reinforcement and/or investment income-reinforcement) (Gladys & Omagwa, 2017). In the light of this, it is desirable to examine the link between assets holding and investment income of pension funds administrators in Nigeria between 2007 and 2020 knowing that the major objectives of pension fund investments are to ensure flow of funds, profitability, safety of pension and sustainable growth survival.

It is against these challenges and problem that the researcher wishes to carry out a research work to investigate the relationship between pension fund assets holding and financial performance of PFAs in Nigeria. The variables under study are investments in ordinary shares, FGN Securities, Corporate Debt Securities and Real Estate Properties as independent variables and Performance of the PFAs in terms of investment income(viz. interest income, dividend income and rental income) as dependent variable.

The following null hypotheses will be tested in this study: *Ho1: Investment in ordinary shares has no statistical significant relationship with investment income of pension fund administrators in Nigeria; Ho2: Investment in federal government securities has no significant correlation with investment income of pension fund*

administrators in Nigeria and Ho₃: Investment in real estate properties is not significantly related to investment income of pension fund administrators in Nigeria and Ho4: Investment in corporate debt securities has no significant correlation with investment income of pension fund administrators.

3. Data and Methods

Correlational research design was utilized in this study, which is a quantitative technique of research that involves two or more quantitative variables from the same set of respondents, from which a link between the variables may be identified (Zikmund, Babin, Carr & Griffin, 2013). For the purpose of exploring the link between variables, correlational research is used. This approach fits well with our current research project, which tries to establish a relationship between assets held and the performance of pension fund managers in Nigeria.

As regards this study, assets holdings of PFAs comprises of ordinary shares, federal government securities (comprising FGN Bonds, Treasury bills, Agency Bonds, Sukuk, Green Bonds), Corporate Debt Instruments (comprising Corporate Bonds and Infrastructure Bonds) and Real Estate Properties. Financial performance is represented by investment income comprising aggregate of interest income, dividend income and rental income.

Secondary data is sourced from the audited annual reports of Pension Commission of Nigeria and Pension Fund Administrator, e-journals and publications. The study reviewed data for pension funds for nineteen (19) years from 2002 to 2020.

The target population for this study was all the 21 registered PFAs in Nigeria as at 31st December, 2020 (PENCOM Annual Report, 2020). PFAs are the 21 private limited liability companies licensed to generate pension contribution, invest and manage pension fund assets under the Pension Reform Act 2004, namely: AIICO, APT, ARM, AXA Mansard, Crusader Sterling, FCMB, Fidelity, First Guarantee, IEI-Anchor, Investment One, Leadway, NLPC, NPF, Oak, Pension Alliance, Premium, Radix, Sigma, Stanbic IBTC, Trust Fund and Veritas Glanvills Pension Fund Administrators. Research will be between 2008 and 2020 (13years) since the pension reform act was enacted in 2004. Stanbic IBTC, Veritas Glanvills and APT Pensions are the top performing PFAs in growth in pension contribution and investment returns in asset holding as at end of 2020 (Pencom Annual Report, 2020)

For example, according to Cooper and Schindler (2011), a sample may be generated from a sampling frame by using the formula for calculating an acceptable sample size from a small population. In order to compute the sample size (at a 95 percent confidence level and a 0.05 significance level), the Slovin's formula was employed, as shown in Equation 1 below.

$$n = N\_ (1+N\ e2)\ n = N\_ (1+N\ e2)\ n = N\_ (1+N\ e2)\ n = N\_ (1+N\ e2)\ n = N\_ (1+N\ e2) \qquad (1)$$

Equation 1: where n is the required sample size and x is the sample size N is the population size, while e is the margin of error (at 95 percent confidence level).

3.1. Model Specification

In this study our adapted model is according to Jensen's alpha (1968). Jensen's alpha is defined as the differential between the return on the portfolio in excess of the risk-free rate and the return explained by the market model. The Jensen measure is based on the Capital Asset Pricing Model. The principle is that of an investor who can split his portfolio between a risky asset and a risk free asset,

$$RP_t - RF_t = \alpha_P + \beta_{1P}(RM_t - RF_t) + \beta_{2P}D_t(RM_t - RF_t) + \varepsilon_{Pt}$$

β_{1P} and β_{2P} coefficients in the equation are estimated through regression.

The model adapted is similar to the one stated below from the work of *Njeru*, Njeru and Kasomi (2015)

Return on Asset (3rd year) = Constant + X1 (Fixed income allocation) + X2 (Equities allocation) + X3 (Offshore allocation) + ε

In this study, There were four independent variables in which the following multiple linear regression analysis models was used to guide the study:

$$\mathbf{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon}$$
$$(3.3)$$

Where;

      Y represents Total Investment Income (TII) (Dependent variable),

      $\mathbf{X_1}$ represents Investment in Ordinary Shares (ORS)

      $\mathbf{X_2}$ represents investment in FGN Securities (FGS),

      $\mathbf{X_3}$ represents investment in Real Estate Properties (REP),

      $\mathbf{X_4}$ represents Investment Value in
Corporate Debt Services (CDS),

      $\mathbf{\beta_0, \beta_1, \beta_2, \beta_3,}$ **and** $\mathbf{\beta_4}$ are regression coefficients to be estimated.

      ε is Error term.

Univariate analysis was first done for each of the independent variables to establish their influence on the dependent variable in preparation for multivariate analysis s follows:

Objective 1: to investigate whether there is statistical significant relationship between ordinary share asset value and investment income of pension fund administrators in Nigeria;

Y = β0+β1X1 + e   2

Objective 2: to assess whether investments in Federal Government of Nigeria (FGN) securities is significantly correlated with investment income of pension fund administrators in Nigeria;.

Y = β0 +β2X2+ e   (3.5)

Objective 3: to find out whether there is statistical significant relationship between real estate properties and investment income of the pension fund administrators in Nigeria

Y = β0+β3X3+ e   (3.6)

Objective 4: to determine the relationship between corporate debt securities and investment income of pension fund administrators in Nigeria

Y = β0+β4X4 + e   (3.7)

Using the coefficient of determination, we were able to assess the model's fitness, which is a measure of how well predictor variables explain fluctuations in the dependent variable. In order to determine the significance of each predictor or independent variable and hypothesis, the t-test was utilized. The p-value for each of the t-tests was used to draw inferences about whether the null hypotheses should be rejected or accepted. The threshold of significance of 5% was used in this investigation to determine whether or not the null hypothesis should be accepted. If the p-value was less than 5%, the null hypothesis was rejected, and the alternative hypothesis was accepted as the correct result. If the null hypothesis was accepted and the alternative hypothesis was rejected, the null hypothesis had a p-value larger than 5 percent.

3.2. *A-priori* Expectation

Investment in Ordinary Shares (ORS), FGN Securities (FGS), Real Estate Properties (REP) and Corporate Debt Services(CDS) are expected to exert positive relationship with Investment Income(TII). The above expectations are presented in mathematical forms below:

$\frac{dORS}{dTII} > 0$:connote that Investment in Ordinary Share is expected to exert positive relationship with Investment Income.

$\frac{dFGS}{dTII} > 0$: connote that Investment in Federal Government Securities is expected to exert positive relationship with Investment Income.

$\frac{dREP}{dTII} > 0$: connote that Investment in Real Estate Properties is expected to exert positive relationship with Investment Income.

$\frac{dCDS}{dTII} > 0$: connote that Investment in Corporate Debt Securities is expected to exert positive relationship with Investment Income.

3.3. Measurement of Variables

VARIABLES/Objective	MEASUREMENT INDICATORS	TYPE OF DATA
Assets holdings: (Independent variable)	Indicators: Asset Allocation/Mix - Investment in Ordinary Shares(ORS) - Investment in FGN Securities(FGS) - Investment in Real Estate Properties(REP) - Investment in Corporate Debt Securities(CDS)	Quantitative secondary data Pandey, I. M. (2010)
Performance of funds administrators: (Dependent variable)	Indicators: Investment Income(TII) - Interest Income(INC) - Dividend Income(DVC) - Rental Income(RTI)	Quantitative secondary data Grinblatt. M. & Titman. S. (1993)

4. Data analysis and Discussion of Findings

4.1. Descriptive Statistics

Table 1 below shows the descriptive statistics of both the dependent and independent variables. The study revealed that all variables, except REP, have a mean value that is higher than the median. Not only that, but it was discovered that FGS has a mean value of 2293.07, which is higher than the others, followed by TII at 234.38, and RTI at 7.30. The standard deviation measures the degree of dispersion from the mean value, and it was discovered that all of the variables have a volatile standard deviation, with the exception of ORS, which has a standard deviation of 0.02 (closer

to 0). It was discovered also that FGS has the highest volatile SD, followed by RTI, and ORS has the lowest. This explained why the variables' skewness was both positive and negative. This indicates that the distribution has both a long left and a long right tail, as all variables are positively skewed except REP, which is negatively skewed. The kurtosis statistic calculates the difference between skewness and kurtosis, and it was discovered that the majority of the variables have a kurtosis value greater than 3.0, while others have a value less than 3.0. This means that the series' variables are both peaked and flattened, indicating that the distribution is both leptokurtic and platykurtic in comparison to the normal distribution. Except for the p-values of DVC, ORS, REP, and FGS, the Jarque-Bera statistics of the series revealed that the p-values of some variables are below 0.05, that is, at the 5% level of significance. In all, the total observation is 19.

Table 1. Descriptive Statistics

	TII	RTI	INC	DVC	CDS	ORS	REP	FGS
Mean	234.3811	7.308421	216.6389	10.43368	153.5800	368.4032	154.0295	2293.076
Median	90.84000	3.770000	83.40000	3.370000	70.52000	358.0300	188.2300	1361.310
Std. Dev.	280.7223	7.944793	264.0573	12.99815	211.0973	209.7746	78.24603	2606.370
Skewness	1.423645	1.752387	1.469642	1.302362	1.466737	0.021647	-0.48872	1.066055
Kurtosis	4.089086	5.025458	4.231931	3.330324	3.930035	1.639831	1.642248	2.761002
Jarque-Bera	7.357095	12.97219	8.040997	5.457516	7.497269	1.466115	2.215769	3.644055
Probability	0.025260	0.001524	0.017944	0.065300	0.023550	0.480438	0.330257	0.161698
Sum	4453.240	138.8600	4116.140	198.2400	2918.020	6999.660	2926.560	43568.44
Sum Sq. Dev.	1418490.	1136.155	1255072.	3041.135	802117.5	792096.7	110203.9	1.22E+08
Observations	19	19	19	19	19	19	19	19

Source: Authors' Computation Using EViews, 9

4.2. Test of Variables

The study estimated data using Auto regressive distributed lag (ARDL) while the unit root was tested using Augmented Dickey Fuller test. The result of the Augmented Dickey Fuller unit root test for stationarity is explained in *Table 2*. It was found that variables such as LRTI and LREP were stationary at level I (0). Achieving this result was achieved by comparing a critical value with a test value at a 5 percent level of significance and discovering that the test level is larger than the critical value, indicating that variables do not have unit root issues. However, variables such as LCDS, LDVC, LFGS, LINC, LORS, and LTII are not stationary at the level I level of analysis. Table 1: (0). We arrived at this conclusion after identifying a situation in which the crucial value outperformed the test value. After that, the researchers tested each of the variables at first difference, and they discovered that they all became stationary at the first difference I. (1). A significant difference between the critical and test values had been discovered by the time we arrived at this step. The null hypothesis (which states that variables have a unit root) was therefore rejected, but the alternative hypothesis (which states that variables do not have a unit root) was accepted (see figure). The research revealed that variables are integrated in diverse orders as a result of this discovery.

Table2. Summary of Augmented Dickey Fuller Test

Variable	Critical value/Prob	@ Level	@ 1st difference	Integration
LCDS	Test	-2.1716	-4.1157	I (1)
	Prob	0.2220	0.0064	
LDVC	Test	-0.1091	-4.4313	I (1)
	Prob	0.9344	0.0038	
LFGS	Test	-0.9427	-3.7323	I (1)
	Prob	0.7499	0.0136	
LINC	Test	-0.3717	-3.4448	I (1)
	Prob	0.8948	0.0248	
LORS	Test	-2.8364	-3.7632	I (1)
	Prob	0.073	0.0135	
LREP	Test	-3.3422	N/A	I (0)
	Prob	0.028		
LRTI	Test	-3.4819	N/A	I (0)
	Prob	0.0213		
LTII	Test	-0.1762	-3.5937	I (1)
	Prob	0.9256	0.0187	

Source: Authors' Computation Using EViews, 9

The long-run relationship between dividend income and asset holding PFA was presented in *Table 3.* The F-statistics of 5.3790 was found to be greater than the

upper bound of 4.01 and greater than the lower bound of 2.86 at a 5% level of significance. Because the Test statistics exceed the upper and lower bounds, it can be concluded that there is a long-term relationship between dividend income and PFA asset holdings in Nigeria.

Table 3. ARDL Bound Test for Co-Integration

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	**5.379055**	10%	2.45	3.52
k	4	5%	**2.86**	**4.01**
		2.5%	3.25	4.49
		1%	3.74	5.06

Source: Authors' Computation Using EViews, 9

The auto regressive distributed lag long run relationship effect between dividend income and PFA asset holding is shown in *Table 4*. The findings revealed that a DLDVC lag of 0.9399 had a negative impact on its innovation. The DLFGS of -0.2707 had a negative impact on FPA's dividend income. PFA's dividend income was positively affected by DLCDS of 0.2316, DLORS of 1.4845, and LREP of 0.3877. This means that a unit increase in DLFGS would result in a decrease in dividend income, whereas a unit increase in DLCDS, DLORS, and LREP would result in increases in dividend income of 23.16 percent, 148.455, and 38.77 percent, respectively. Further research reveals that the lag between DLDVC and DLORS had a significant impact on dividend income

Table 4. ARDL Long-Run Effect

Dependent Variable: Dividend Income

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.941167	1.005959	-1.929668	0.0825
DLDVC(-1)*	-0.939933	0.270784	-3.471157	0.006
DLCDS**	0.23165	0.176487	1.312558	0.2187
DLFGS**	-0.270751	0.429198	-0.630831	0.5423
DLORS(-1)	1.484541	0.569533	2.606594	0.0262
LREP**	0.387719	0.178169	2.176134	0.0546
D(DLORS)	0.606438	0.375629	1.614458	0.1375

Source: Authors' Computation Using EViews, 9

Due to the obvious non-significant variables in Table 3, the study looks for a short-run relationship between PRA's dividend income and asset holdings. The result presented in *Table 5* shows that only DLORS of 0.6064 had a significant impact on dividend income at 5 percent percent. While the ECM (-1) of 83.17 percent indicates a positive sign, it was significant at the 5 percent level of significance. This means

that inconsistencies in the short run are corrected instantly and incorporated into the long run at a rate of 83.17 percent annually.

The coefficient of determination R^2 0.7319 which is about 73.19% variation in dividend income is explained by the explanatory variables used in this study, while the remaining 26.81 per cent is explained by other variables not included in the model. The adjusted R^2 of 69.37 per cent explained the reaction of dependable variable based on the number of variables in the model. Checking the overall significance of the model, the study employed F-statistics and it was found that calculated F-statistics of 19.118 was higher than the F-statistics tabulated of 2.90 which indicates that, the whole model is significant in explaining the relationship between the assets holding and dividend income of PFA. Durbin Watson of 2.142 is closed to upper bound of Savin and White table of 1.848, i.e. 4-2.14= 1.846. Therefore, it shows that series is no serial correlation.

Table 5. ARDL Short-Run Effect

Dependent Variable: Dividend Income

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.941167	0.321513	-6.037596	0.0001
D(DLORS)	0.606438	0.176993	3.426344	0.0065
CointEq(-1)*	-0.939933	0.153177	-6.136236	0.0001
R^2=0.7319	Adj-R^2=0.6937	F-Stat=19.1187	Prob=0.0009	D.w=2.1485

Source: Authors' Computation Using EViews, 9

Section B

The section focused on the impact of asset holding on total investment income of Nigerian PFAs. This study made use of auto regressive distributed lag. The ARDL Bound test between asset holdings and total investment income is shown in *Table 6*. The study compared test statistics with critical value and discovered that the t-test of 3.9808 is less than the upper bound of 4.01 at the 5% level of significance. This implies that there is no long-run relationship between PFA assets and total investment income.

Table 6. ARDL Bound Test for Co-Integration

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	3.980822	10%	2.45	3.52
K	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06

Source: Authors' Computation Using EViews, 9

The short run effect of ARDL is shown in ***Table 7***. This is necessary because there is no long-run relationship between asset holding and total investment income. According to the data presented, only DLFGS are relevant in the short run. Furthermore, DLFGS of -0.1072 had a negative and insignificant impact on total investment income. While the ECM (-1) of 79.69% shows a positive sign and was significant at the 5% level of significance. This means that short-run discrepancies are corrected instantly and incorporated into the long-run at a rate of 79.7 percent annually. The coefficient of determination R^2 0.7112 explained that the explanatory variables used in this study explain 71.12 percent of the variation in total investment income, while the remaining 28.88 percent is explained by other variables not included in the model. The adjusted R^2 of 67.00 percent explained the reaction of the dependable variable based on the number of variables in the model. To assess the overall significance of the model, the study used F-statistics, and it was discovered that the calculated F-statistics of 17.2448 were greater than the tabulated F-statistics of 2.90, indicating that the entire model is significant in explaining the relationship between the assets held and total investment income of PFA.

Table 7. ARDL Short Run Effect

Dependent Variable: DLTII

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.144826	0.062713	2.309356	0.0436
D(DLFGS)	-0.107295	0.278828	-0.384807	0.7084
CointEq(-1)*	-0.796961	0.150974	-5.278802	0.0004
R^2= 0.7112	Adj-R^2=0.6700	F-stat=17.2448	Prob=0.0001	D.W=1.9784

Source: Authors' Computation Using EViews, 9

Section C

Section focused on the relationship between assets holding and interest income. The study also used auto regressive distributed lag as the two explained their relationship The study also employed auto regressive distributed lag to explain the two's relationship. ***Table 8*** shows the outcome of the long run relationship. The F-statistic of 3.8000 was discovered to be less than the critical upper bound of 4.01. This implies that there is no significant long-run relationship between PFA asset holding and interest income.

Table 8. ARDL Bound Test for Co-Integration

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	**3.800722**	10%	2.45	3.52
K	4	**5%**	**2.86**	**4.01**
		2.5%	3.25	4.49
		1%	3.74	5.06

Source: Authors' Computation Using EViews, 9

Because no long run relationship exists, the short run relationship was estimated. *Table 8* shows that DLFGS of -0.0853 had a negative and insignificant impact on interest income in the short run. This means that a unit increase in DLFGS would result in a decrease in interest income.

The coefficient of determination R^2 of 0.6944 explained that the explanatory variables used in this study explain 69.44 percent of the variation in interest income, while the remaining 30.46 percent is explained by other variables not included in the model. The adjusted R^2 of 65.07% explained the reaction of dependent variable based on the number of variables in the model. The study used F-statistics to determine the overall significance of the model, and it was discovered that the calculated F-statistics of 15.908 were greater than the tabulated F-statistics of 2.90, indicating that the entire model is significant in explaining the relationship between the assets held and the interest income of PFA. Durbin Watson of 2.12 demonstrates that series have no serial correlation problem because it is close to 2.

Table 9. ARDL Short Run Effect

Dependent Variable: DLINC

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.231629	0.078611	2.946511	0.0146
D(DLFGS)	-0.085327	0.30872	-0.27639	0.7879
CointEq(-1)*	-0.831742	0.161253	-5.158009	0.0004
R^2= 0.6944	Adj-R^2=0.6507	F-stat=15.9082	Prob=0.0002	D.W=2.1274

Source: Authors' Computation Using EViews, 9

Section D

Section D used Auto Regressive Distributed Lag estimation to estimate the effect of asset holding on total rental income of PFA in Nigeria. According to *Table 10*, the F-statistic of 5.19 is greater than the critical upper bound of 4.01. This implies that asset holding and rental income are co-integrated.

Table 10. ARDL Bound Test for Co-Integration

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	5.191845	10%	2.45	3.52
K	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06

Source: Authors' Computation Using EViews, 9

Table 11 depicts the long-run relationship between PFA asset holding and rental income in Nigeria. The results show that LRTI of -1.1743 had a negative and significant impact on its innovation in the long run. This implies that, if all other variables were held constant, rental income would have no positive effect on its own innovation. Furthermore, the study found that DLCDS of 0.0333 and LREP of 0.7456 had a positive and insignificant impact on rental income, while DLFGS of -2.4660 and DLORS of -0.5488 had a negative and insignificant impact on rental income. This means that a unit increase in DLCDS and LREP would result in a 3 percent increase in rental income and a 74.565 increase in rental income, respectively, while a unit increase in DLFGS and DLORS would bring about 246 percent and 54.88% percent decrease in rental income.

Table 11. Long run Effect

Dependent Variable: LRTI

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.164497	2.313365	-0.503378	0.6238
LRTI(-1)*	-1.174394	0.247331	-4.748258	0.0005
DLCDS**	0.033321	0.49745	0.066983	0.9477
DLFGS**	-2.466082	1.355895	-1.818786	0.0940
DLORS**	-0.548849	1.033979	-0.530812	0.6052
LREP**	0.745674	0.442384	1.685582	0.1177

Source: Authors' Computation Using EViews, 9

4.2. Discussion of Findings

This study looked at the relationship between asset holding and PFA performance in Nigeria. The purpose of this study was to learn how the administration of pension funds' investments affected their performance. The study wants to know if the PFA used the pension funds sourced from various employees wisely and if such investments resulted in significant returns, and the study covered the temporal period

2002 to 2020. To achieve the stated hypotheses, the study proxied the PFAs Performance by total investment income as aggregate of rental income, dividend income, and interest income, while asset holding was measured by investment in ordinary shares, investment in Federal Government securities, investment in real estate properties, and corporate debt securities. The data was obtained from secondary sources and estimated with autoregressive distributed lag (ARDL). The study discovered a long-run relationship between asset holdings and dividend income, as well as a long-run relationship between asset holdings and rental income. Further research reveals that investing in federal government securities (FGS) had an insignificant negative effect on all performance measures tested. Furthermore, the study discovered that investment in corporate debt securities (CDS), ordinary shares and real estate properties (REP) had positive statistically significant relationship with total investment income. This result implies that PFA investment in FGS is too high and do have weak correlation with financial performance, which explains the negative and insignificant effect on all the performance measures. The investment in ordinary shares also indicates a low investment by PFA, despite the fact that it has a significant impact on dividend income, it does not reflect on the total investment as expected.

5. Conclusion and Recommendations

5.1. Conclusion

This study examines the relationship between assets holding and financial performance of Pension Fund Administrators in Nigeria. Nigeria has experienced significant increases in registered contributors and pension assets. This increased pool of funds could be a potential source for revamping recession for economy development. The Pension Fund Assets are growing rapidly and would increasingly provide a source of investment funds. Composition of investment vehicles by PFAs affect the financial performance of the pension funds.

Assets holding requires a sophisticated approach in order to balance between the investment incomes from the asset classes, the period of reporting and the maturity of the pension fund liabilities. The findings of the study indicate that by selecting the appropriate portfolio holdings that would maximize the returns on the pension funds, it is possible to enhance the financial performance of pension funds and help them accomplish their ultimate goal of providing income replacement in retirement.

According to the findings of the research, common stocks and real estate holdings outperformed all other asset types under consideration. Despite the high magnitude of the investment, the performance of federal government securities was the worst of all pension funds' holdings. Pension Fund Administrators may wish to minimize their over-exposure to federal government securities unless they are confident in the

predicted interest income from these investments.. In general, investments in corporate debt securities and federal government securities generated the least amount of investment income during the course of the research. There is little doubt that they advise the administrators of pension funds to invest for the long haul. According to the findings of the study, pension fund managers' financial performance in Nigeria is significantly influenced by their asset holdings. This means that pension fund managers must take into account the asset mix when making investment decisions for their pension funds.

5.2. Recommendation

Based on the research findings, the recommendations are as follows:

(i) This study established that the firms should increase the allocation of resources towards investments in ordinary shares, and utilize available resources in domestic and foreign stock exchanges.

(ii) Re-formulate investments policy for optimum assessment of investment in federal government securities and treasury bills with a view to avoid over-exposure and high investment income.

(iii) There should be more emphasis on the management of pension assets in the real sector via investment in real estate properties to boost rental income.

(iv) Since the study found that the major issues concerning pension fund managers are the allocation of its fund to corporate debt securities in such a way that it achieves a balance in terms of interest income and overall financial performance, hence, overall effort should be geared toward effective and efficient management of pension funds invested in corporate commercial bill and debentures.

(v)Professionals should be employed by PFAs to increase competence and professionalism in the Investment of pension funds in ordinary shares, federal government securities, real estate properties and corporate debt securities and related risks and investment incomes thereon.

References

Abata, M. A. (2014). Assets Quality and Bank Performance: A Study of Commercial Banks in Nigeria. *Research Journal of Finance and Accounting*, *5* (18), pp. 39 – 44.

Chandra P. (2009). *Investment Analysis and Portfolio Management Third Edition*, Tata Mc. Graw – Hill Publishing Company Limited, New Delhi.

Cohen, R.B.; Coval, J.D. &Pastor, L. (2005). Judging Fund Managers by the Company they Keep. *Journal of Finance*, *60*(3), pp. 23-43.

Gladys M. & Omagwa, J. (2017). Asset Structure and Financial Performance: A Case of Firms Quoted Under Commercial and Services Sector at the Nairobi Securities Exchange, Kenya. *Research Journal of Finance and Accounting, 8* (4), pp. 192-200.

Grinblatt. M. & Titman. S. (1993). Performance measurement without benchmarks: an examination of mutual fund returns. *Journal of Business*, *66* (1), pp. 47-68.

International Accounting Standards Board (2018). *Conceptual Framework for Financial Reporting*. United Kingdom: IASB.

Jensen, M. (1972). *Optimal utilization of market forecasts and the evaluation of investment performance in mathematical methods in investment and finance*, Elsevier.

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

Markowitz, H. (1959). *Portfolio Selection: Efficient diversification of Investment.* John Wiley, New York.

Morales, J. (2017). Fair Value in Financial Instruments Accounting. Analysis from a Historical Perspective. *DE COMPUTIS Spanish Journal of Accounting History*, *26*, pp. 90-154.

Mungai, M. (2017). The effect of alternative investments on financial performance of pension funds in Kenya. *A Master's Thesis*, School of Business. University of Nairobi.

Njeru, S. E.; Njeru, M. D. & Kasomi, F. (2015). Evaluation of financial performance on portfolio holdings held by pension funds in Kenya. *European Science Journal*, 11(16), pp. 112-127.

OECD. (2015). *OECD Guidelines of Pension Fund Asset Management*. OECD Publishing.

Pandey, I. M. (2010). *Financial Management*. (9th ed.). New Delhi, India: Vikas Publishing House Pvt Ltd.

Pension Commission of Nigeria (2020*). Pencom Annual report*. www.pencom.org.ng.

Sharpe, W. (1992). Asset allocation: management and performance measurement. *Journal of Portfolio Management*, *21*, pp. 7-19.

Van Horne, J. C. (2010). *Fundamental of financial management*, 13th Edition. Pearson Education Ltd.

Zikmund, W. G.; Babin, B. J.; Carr, J. C. & Griffin, M. (2013). *Business research methods*. London: Cengage Learning.