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ASSETS HOLDING AND FINANCIAL PERFORMANCE OF PENSION FUND ADMINISTRATORS IN NIGERIA

Pension funds are founded to ensure contributors benefit from regular or lump sum income upon retirement. The financial performance of pension funds in Nigeria seems fraught with uncertainties, risk and delay in payment of benefits thus raising doubts whether they can be able to achieve their primary objective. This study was carried out to evaluate the relationship between assets holding and financial performance of Pension Fund Administrators (PFAs) in Nigeria. 21 PFAs were examined under this study through judgmental sampling. The study sourced secondary data from PFAs. The data collected relates to investment in classes of asset and the investment reports on dividend income, interest income and rental income. The data was analyzed using correlational statistics to determine if there is a significant statistical difference in the asset classes and component of investment income. Assessments of association between composition of the various pension fund portfolio and the amount of the various asset classes vis a vis the investment income earned were also made to find out if diversification of the portfolio affects the financial performance of the pension funds. The research revealed that the collection of assets by the PFAs affect the financial performance of the pension funds. From the analysis it is clear that assets holding is positively and statistically significant with the financial performance of PFAs. Therefore, it is very critical for PFAs to consider the assets mix in the fund management without over-exposure to a particular asset.

Key words: assets holding, financial performance, pension fund administrators.

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Нигериядағы зейнетақы қорларының активтерді иеленуі және қаржылық қызметі

Зейнетақы қорлары салымшылардың зейнетке шыққаннан кейін тұрақты немесе біржолғы табыс алуын қамтамасыз ету үшін құрылады. Нигериядағы зейнетақы қорларының қаржылық көрсеткіштері белгісіздікке, тәуекелге және пайданы кешіктіруге толы болып көрінеді, бұл олардың негізгі мақсатына қол жеткізе алатындығына күмән тудырады. Бұл зерттеу активтерді иелену мен Нигериядағы зейнетақы қорларының қаржылық көрсеткіштері арасындағы байланысты бағалау үшін жүргізілді. Осы зерттеу аясында іріктеу арқылы 21 зейнетақы қоры зерттелді. Зейнетақы қорларынан қосымша мәліметтерді зерттеу жүргізілді. Жиналған деректер активтер класындағы инвестицияларға және дивидендтер, пайыздық кірістер және жалдау бойынша кірістер түріндегі инвестициялық кірістер туралы есептерге қатысты. Деректер активтер сыныптары мен инвестициялық кіріс құрамдастарында елеулі статистикалық айырмашылық бар-жоғын анықтау үшін корреляциялық статистиканы пайдалана отырып талданды. Сондай-ақ портфельді әртараптандырудың зейнетақы қорларының қаржылық көрсеткіштеріне әсер ететінін анықтау мақсатында әртүрлі зейнетақы қорларының портфелінің құрамы мен әртүрлі активтер сыныптары санының инвестициялардан алынатын табысқа қатысты арақатынасына бағалаулар жасалды. Зерттеу нәтижесінде активтерді жинау зейнетақы қорларының қаржылық көрсеткіштеріне әсер ететіні анықталды. Талдау көрсеткендей, активтерді иелену зейнетақы қорының қаржылық нәтижелері үшін оң және статистикалық маңызды мәнге ие. Осылайша, зейнетақы қорлары үшін қорды басқару кезінде белгілі бір активке артық әсер етпей, активтер жиынтығын ескеру өте маңызды.

Түйін сөздер: активтер, қаржылық көрсеткіштер, зейнетақы қорлары.

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Владение активами и финансовая деятельность пенсионных фондов в Нигерии

Пенсионные фонды создаются для того, чтобы вкладчики получали регулярный или единовременный доход после выхода на пенсию. Финансовые показатели пенсионных фондов в Нигерии кажутся сопряженными с неопределенностью, риском и задержками в выплате пособий, что вызывает сомнения в том, смогут ли они достичь своей основной цели. Это исследование было проведено для оценки взаимосвязи между владением активами и финансовыми показателями пенсионных фондов в Нигерии. 21 пенсионный фонд был изучен в рамках этого исследования путем выборки. В исследовании были получены вторичные данные из пенсионных фондов. Собранные данные относятся к инвестициям в классы активов и инвестиционным отчетам о доходах в виде дивидендов, процентных доходов и доходов от ренты. Данные были проанализированы с использованием корреляционной статистики, чтобы определить, существует ли значительная статистическая разница в классах активов и компонентах инвестиционного дохода. Были также проведены оценки связи между составом портфеля различных пенсионных фондов и количеством различных классов активов по отношению к полученному доходу от инвестиций, чтобы выяснить, влияет ли диверсификация портфеля на финансовые результаты пенсионных фондов. Исследование показало, что сбор активов влияет на финансовые показатели пенсионных фондов. Из анализа видно, что владение активами имеет положительное и статистически значимое значение для финансовых показателей пенсионного фонда. Таким образом, для пенсионных фондов очень важно учитывать сочетание активов при управлении фондом без чрезмерного воздействия на конкретный актив.

Ключевые слова: активы, финансовые показатели, пенсионные фонды.

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 pool of fund that accumulates over an employee's working years and pays retirement benefits during the employee's nonworking years. Pension funds are investing the funds according to a stated set of investment objectives in securities (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.

Literature Review

Conceptual Review

Assets Holding

According to Sharpe (1992), asset holding is simply pool of investment assets. Van Horne (2010) asserts that assets holding is a combination of two or more securities of asset, that is, the various asset classes that financial manager has invested in. Essentially, financial managers constantly strive to achieve optimal assets holding to sustain the higher growth in volume of business and earnings of their firms (Abata, 2014).

An investor holding a portfolio of fixed income securities until the maturity date faces no uncertainty about interest income (Pandey, 2010). In the case of a portfolio composed of common stocks, however it will be impossible to predict the value of the portfolio at any future date. Concentrating all investments in one investment class can lead to over-exposure. The main asset classes through which an investor can diversify investments are: shares, bonds and properties (Pandey, 2010). Bonds have the lowest risk, shares have the highest risk and somewhere between are the estate properties.

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. Financial performance measurement is important because it provides the basis for evaluating the decisions that investors make as part of developing their investment strategy. A good performance measurement system will, therefore, endeavour to answer questions, viz., what investment income have been earned? How do these investment income compare with other portfolios and assets? Can effective and efficient financial performance be achieved consistently from period to period?

The financial performance of a pension fund is largely measured by the investment income generated by the fund. This investment income is generated from the various assets in the portfolio. Chandra (2009) posited that the pension fund has to specify the asset allocation, that is, the pension fund has to decide how much of the collection of investment vehicles has to be employed in each of the following asset categories bonds, stocks, real estate, mutual funds, trust funds and others.

Pension funds examines various items when considering the investments, that is, investment income, capital appreciation, and safety of the funds. Buying undervalued stocks and selling overvalued stocks and locking gains on interest bearing assets like government's securities and corporate bonds. 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).

The following vital fundamentals in the financial stability of any pension fund administrator, viz., benefits, contributions and asset allocation (investment). These basics are dependable on one another. If pension funds asset allocation delivers too low investment income, then the regular or lump sum benefits may not be delayed without an increase in beneficiaries' contributions. Thus social security stability depends on all three elements. The

role of assets holding must be to generate projected investment incomes that maintains the pension fund's solvency, which means contributions plus investment returns equals or exceeds the benefits.

Assets Holding and Financial Performance

Pension funds' portfolio performance is measured by reported investment income (Yang and Mitchell, 2005). High investment income are desirable because they enable the pension fund to maintain sufficient and appropriate funding. It has been emphasised that, efficient pension fund assets holding should maximize investment income and be adequately well funded. O'Neill (2007) asserts that good returns on investment are central to sustainable pension payments.

Grinblatt and Titman (1993) offered theory on assessment of financial performance based on the composition of the portfolio. The measure is based on the study of changes in the composition of the portfolio. It is based on several assumptions regarding investor aversion, rationality and preference, that investors consider each investment alternative as being represented by a probability distribution of expected returns on investment over assets holding period. Grinblatt and Titman (1993) suggest 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 in the measure based on levels of holdings.

Cohen, Coval and Pastor (2005) supported 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 bear a resemblance to the decisions of managers with excellent performance histories. They suggested two performance measures that use historical returns and holdings of various funds to appraise the performance of a fund. The first measure is based on level of holdings, while the second one is based on changes in holdings.

In this study, assets holding comprises of shares, debentures, bond, properties and cash and other asset. Pension systems should, therefore, be managed effectively through financial management so as to increase the investment income for the sustainability of all retirement benefits stakeholders. However, tt is not clear if the choice of the assets in a portfolio affects the performance of the pension fund.

Theoretical Review

Modern Portfolio Theory (MPT)

H. H. Markowitz first developed the Modern Portfolio Theory (MPT) in 1952 which was a financial model, that demonstrated well-diversified portfolio. The portfolio theory provides a normative approach to the investors' decision to invest in assets or securities under risk. MPT describe the age-old adage "Don't put all your eggs in one basket''. The portfolio theory subscribed to diversification by determining the benefit of diversification in terms of expected returns and risk. Ultimately, however, even with a larger number of assets, there is no way to avoid all risk. All assets are affected by common macroeconomic factors.

Markowitz was therefore the first person to prove mathematically, that it was a question of how many eggs to put in which basket. Portfolio theory assumes an investor is both rational and risk averse, that is, they would choose that portfolio which offers the highest returns for a given level of risk and as such has a number of choices of investments assets to form a portfolio. All investment opportunities involve risk and reward. Markowitz showed that assets in a portfolio can be combined to provide an "efficient frontier" portfolio and investors should operate along efficient frontier.

Empirical Review

Njeru, Njeru and Kasomi (2015) assessed the influence of portfolio holdings held by pension funds and their financial performance in Kenya. The study surveyed 1,262 pension funds in Kenya. A sample of 35 pension funds was selected for this study. The study sourced secondary data from pension fund administrators. The data are collected from financial reports of the pension fund as it relates to pension fund portfolio, investment reports and the audited financial statements. The research sought to measure and appraise if there is any significant correlation between the portfolio holdings and the financial performance using the spearman's rank coefficients of correlation. The data was analyzed using inferential statistics to determine if there is a significant statistical difference in the asset classes. The findings reveal that there was no significant correlation for fixed income allocation and returns at 3 months, 1 year and 3 years. On common stock, there was significant inverse correlation between the allocation and the returns at 1 year but none at 3 months and 3 years. There was weak positive relationship between offshore investment and returns.

Kiplagat (2014) studied the effect of asset allocation on the financial performance of pension funds. The study discovered that there is a linear positive relationship between fund performance and the weightiness of asset classes with the strongest correlation being between fund performance

and asset weights of cash and cash equivalents, quoted ordinary shares, government bonds, and real properties. The study established that 58% of the variability among fund performance is due to financial policy preference and differences in the asset combination of the various funds. The balance of about 42% is due to other factors such as the manager's selection, the timing of investments and securities selection within an asset class.

Namusonge, Sakwa and Gathogo (2017) examined the effect of asset structure on the financial performance of registered occupational pension schemes. The study discovered that the asset structure has an immensely positive influence on the financial performance of occupational pension schemes. From the research, the independent variable (asset structure) revealed that 66.1% of the variation in the financial performance of pension schemes could be predicted by the explanatory variable. This study made a very important contribution to investment strategy but did not assess its effect of assets structure on the sustainability of pension fund institutions.

Mungai (2017) investigated the relationship between alternative investments and financial performance of pension funds. The alternative investments were investment in private equity, real estate, investment trust, venture capital and bonds. It was discovered that majority of pension schemes had largest allocation in fixed income and government securities and quoted equity, with slight allocation in private equity and venture capital and real estate investment trusts. All alternative investments except venture capital and private equity were discovered to possess positive significant relationship with financial performance of pension funds. The research did not cover mutual fund and the period covered was short term not exceeding 5years. The work did not focus on investment income.

Gladys & Omagwa (2017) sought to evaluate the association between the asset mix and the financial performance of the firms quoted under the commercial and service sector at Stock Exchange in Kenya. The population of the study was the secondary data from the annual reports of the quoted companies. The asset mix is analyzed in term of: property, plants and equipment; current assets; intangible assets; and long term investments and funds, which formed the explanatory variables. The outcome variable of interest was the financial performance of the firms, and was proxied in terms of: productivity, turnover and sales volumes, by aid of a composite index. A census was done on the entire firms listed under this commercial and service sector by the year 2014, for a five-year period, 2010 to 2014. The results of the research showed that asset mix had a statistically significant effect on the financial performance. In particular, the study found that: property, plants and equipment, and long-term investments and funds have a statistically significant effect on financial performance, while current assets and intangible assets do not have statistical significance on financial performance. This study established that the firms should increase the allocation of resources towards long term investments and funds, and employ more resources in terms of the property, plant and equipment efficiently.

The importance of assets in generating value for companies has attracted a great deal of research on different aspect of assets both from developed and developing economy. There exist sufficient empirical evidence supporting the asset structure and performance hypotheses. 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:

Ho_1: Investment in ordinary shares has no statistical significant relationship with investment income of pension fund administrators in Nigeria;

Ho_2: Investment in federal government securities has no significant correlation with investment

income of pension fund administrators in Nigeria;

Ho_3: Investment in real estate properties is not significantly related to investment income of pension fund administrators in Nigeria;

Ho_4: Investment in corporate debt securities has no significant correlation with investment income of pension fund administrators.

Methodology

This study used a correlational research design which is a quantitative method of research with two or more quantitative variables from the same group of subjects, from which a relationship is determined between the variables (Zikmund et al., 2013). Correlational research is used to explore the relationship between variables and this is consistent with this study which seeks to establish the relationship between assets holding and performance of pension funds administrators 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)

Cooper and Schindler (2011) recommend that a sample can be drawn from a sampling frame using a formula for determining an appropriate sample from a small population. 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 in Equation 1 below.

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

where,

n = is the desired sample size

N = is the population size

e = margin of error (at 95% confidence level)

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 riskfree asset,

$$RPt - RFt = \alpha P + \beta 1P(RMt - RFt) + \\ + \beta 2PDt(RMt - RFt) + \varepsilon Pt \quad (2)$$

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)

$$\text{Return on Asset } (3^{rd} \text{ year}) = \text{Constant} + \\ + X_1 (\text{Fixed income allocation}) + \\ + X_2 (\text{Equities allocation}) + \\ + X_3 (\text{Offshore allocation}) + \varepsilon \quad (3)$$

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

$$Y=\beta 0+\beta 1X1+\beta 2X2+\beta 3X3+\beta 4X4+\varepsilon \quad (4)$$

where,

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

X_1 represents Investment in Ordinary Shares (ORS)

X_2 represents investment in FGN Securities (FGS),

X_3 represents investment in Real Estate Properties (REP),

X_4 represents Investment Value in Corporate Debt Services (CDS),

β_0, β_1, β_2, β_3, and β_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

$$Y = \beta0+\beta1X1 + e \quad (5)$$

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

$$Y = \beta0 +\beta2X2+ e \quad (6)$$

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

$$Y = \beta0+\beta3X3+ e \quad (7)$$

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

$$Y = \beta0+\beta4X4 + e \quad (8)$$

The model fitness was estimated using the coefficient of determination which helps to explain how closely the predictor variables explain the variations in the dependent variable. The t-test statistic was used to test the significance of each predictor or independent variable and hypothesis. The p-value for each t-test was used to make conclusions on whether to reject or accept the null hypotheses. 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 alternative hypothesis was accepted. Also if the p-value was greater than 5 percent, the null hypothesis was accepted, and the alternate hypothesis was rejected.

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.

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 (2010)
Performance of funds administrators: (Dependent variable)	Indicators: Investment Income(TII) • Interest Income(INC) • Dividend Income(DVC) • Rental Income(RTI)	Quantitative secondary data Grinblatt & Titman (1993)

Results and Discussion

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
Note – compiled by the authors								

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). This was arrived at by checking the critical value against the test value @ 5% level of significance, and it was found that, the test level is greater than the critical value which indicates that, variables have no unit root problems. However, the variables such as LCDS, LDVC, LFGS, LINC, LORS and LTII are not stationary at level I (0). This was arrived at when the critical value was found to be higher that the test value. The study went further to test at first difference for these variables, and it showed that, they all became stationary at first difference I (1). At this point, the critical value was found to be lesser than the test value. Hence, the null hypothesis which says, variables have unit root are rejected while the alternate hypothesis which says that variables have no unit root was accepted. Hence, the study discovered that variables are integrated of different order.

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 2 – 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	
Note – compiled by the authors				

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
Note – compiled by the authors				

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

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.

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
Note – compiled by the authors				

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
Note – compiled by the authors				

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.

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 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
Note – compiled by the authors				

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
Note – compiled by the authors				

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
Note – compiled by the authors				

Because no long run relationship exists, the short run relationship was estimated. Table 9 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
Note – compiled by the authors				

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
Note – compiled by the authors				

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
Note – compiled by the authors				

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.

Conclusion and recommendations

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 research highlights the potential to improve the financial performance of pension funds to achieve their ultimate objective of providing income replacement in retirement by choosing the right portfolio holdings that will optimize returns of the pension funds.

From the research, ordinary shares and real estate properties performed better compared to all other asset classes under study. Federal Government securities' performance was the least for all pension funds asset despite the huge investment value. Pension Fund Administrators may want to reduce their over-exposure into federal government securities unless well convinced of the expected interest income. The least investment income was from the investments in corporate debt securities and federal government securities over period of study. These clearly inform the pension funds administrators to invest in long term. From the analysis it is clear that assets holding has a significant effect on the financial performance

of pension fund administrators in Nigeria. Therefore it is very critical for a pension fund administrators to consider the assets mix in the fund management.

Recommendations

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.

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