DOI: 10.32602/jafas.2023.014

JOURNAL OF ACCOUNTING, FINANCE AND AUDITING STUDIES

http://www.jafas.org

Financial Performance Adequacy of Pension Fund Managers in Nigeria

Adeoye A Afolabi[a] **Lourens J Erasmus**[b]

[a] Kwara State University– Department of Accounting and Finance, Faculty of Management and Social Sciences, Malete, Nigeria, adeoye.afolabi@yahoo.co.uk

[b] University of South Africa– Department of Financial Governance, College of Accounting Sciences, South Africa, erasmlj1@unisa.ac.za

Keywords

Pension cost; Securities; Inflation; Benefits paid; Inflow contribution; Pension fund manager.

Jel Classification

H55, H75.

Paper Type

Research Article

Received

15.01.2023

Revised

08.02.2023

Accepted

17.02.2023

Abstract

Purpose: Traditionally, the Nigerian pension fund system was based on a defined benefit scheme for the public and private sectors and coincided with serious challenges in the payment of retirement benefits to retirees. These challenges led to the introduction of a defined contribution scheme in terms of the Pension Reforms Act. Since the management of pension fund assets is the sole responsibility of pension fund managers, there is a need to investigate the adequacy of pension fund managers' financial performance since the change in pension fund regime. The pertinent research question in the study was: To what extent do pension cost incurred, revenue, the inflation rate and total contribution affect benefits paid and cash inflow? The extent to which federal government bonds, securities, total contribution and the inflation rate affect investment income were also examined.

Methodology: Autoregressive distributed lag (ARDL) cointegration and multiple regression were used in the analysis of the data.

Findings: The results of the study revealed that in both the short-term and long-term analysis, other costs incurred by pension fund management lead to lower benefits paid to retirees. Furthermore, higher administrative costs lead to higher benefits paid, given that increases in administrative costs promote higher inflow contributions, and investing in federal government bonds and, in particular, Treasury bills promotes higher investment income. Thus, securities increase investment income, and the higher the inflation rate, the higher the investment income.

Originality/Value: The policy implication signifies a need to reduce pension costs incurred on pension fund management and to encourage more investment in real assets that can militate against inflation.

Introduction

The global population is aging and fiscal stress is placing pension fund systems under increasing pressure, raising concern in developed countries, such as the United Kingdom (UK) and the United States of America (USA) (Hsin & Mitchell, 1995). Developed countries have recognised that the situation necessitates the introduction of a measure of some kind to reduce high pension fund operating costs without reducing the quality of retirement services. The main interest of pensioners and beneficiaries is whether the management of their contributions to future retirement savings is producing optimal returns, thereby adding value to their investment (Alda, 2018). Fortunately for developed countries, it was found that their pension fund industries contribute to economic growth and play a significant societal role, which made global pension fund investments grow significantly over the past two decades (Alda, 2018). Furthermore, developed countries' pension funds are investment products that serve the purpose of enabling their members to save for their retirement.

Global pension fund designs can be assessed based on their target returns, asset allocation, cash flow, fund manager selection and the cost involved (Wanger, 2021). In the Organisation for Economic Cooperation and Development (OECD) countries, pension fund assets increased up to EUR15.6 trillion in 2011 (Ballester, 2014). This growth suggests that the pension fund industry is a major investor in the economies of OECD countries. Moreover, Erzurumlu and Ucardag (2021) claim that the total asset size of OECD pension funds increased by 10 per cent annually between the financial crises of 2008 and the end of 2019. This growth amounted to US$32.2 trillion.

Several studies have been conducted on pension fund performance in developed countries. In the Euro zone, Otero-Gonzalez *et al.* (2021) focused on active management, value investing and pension fund performance. Li and Cowton (2022) examined a defined benefit pension de-risking strategy as a determinant of pension buy-ins in the UK. Clark (2022) revealed the problematic nature of pension regulation in performance governance, at the expense of innovation, in the UK. Alda

et al. (2017) examined the performance of individual pension fund managers in the UK. Ballester (2014) analysed investor responses to various measures of pension plan performance in Spain.

Studies on pension fund performance in emerging economies such as Turkey have examined private pension fund flow, performance and cost relationships under frequent regulatory changes (Erzurumlu & Ucardag, 2021). Chu (2008) reviewed the performance persistence of pension fund managers in Hong Kong. Mittelstaedt and Olsen (2003) examined whether the risk-adjusted returns of the pension fund system in Chile were consistent with the Chilean economy. Several studies have been conducted regarding pension funds in Nigeria. Ifenna and Arinze (2020), for example, investigated the relationship between pension fund administrators and the financial transparency of retirement savings. Prior to Ifenna and Arinze's study (2020), pension administration, in both the public service and the private sector, experienced several challenges. The public service operated a defined benefit scheme (DBS), and the payment of retirement benefits was budgeted for annually. The complications of a DBS led to the pension fund reforms of 2004. The Pension Reforms Act (PRA) of 2004, as amended in 2014, is the most recent legislation of the Federal Government of Nigeria that is aimed at reducing the difficulties encountered by retirees in Nigeria (National Pension Commission [NPC], 2019).

The PRA covers pension fund members from both the public and private sector. The PRA established a defined contribution scheme (DCS) that is regulated and supervised by the National Pension Commission (NPC). The Commission has the power to formulate, direct and oversee the overall policy on pension matters in Nigeria. The pension fund administrators are represented by firms that manage the pension funds (NPC, 2019). A DBS promises a specific income based on rules set out by the scheme, while a DCS depends on factors such as the member's contribution and the fund's investment performance. The retirement savings account of a DCS is managed by pension fund managers.

Against this background, this study investigated the adequacy of the financial performance of firms classified as pension fund managers in Nigeria. The rationale

for this investigation was to determine whether the PRA has succeeded in dealing with the various challenges brought about by the old DBS. As a result, two research questions were formulated. The first research question is as follows: To what extent do pension cost, revenue, the inflation rate and total contribution affect benefits paid and cash inflow? The second research question is as follows: To what extent do federal government bonds, securities, revenue, total contribution and the inflation rate affect investment income? Nigeria was selected from among other sub-Saharan countries because of its increasing population of retirees, registered pension fund contributors from public and private organisations and pension fund managers, on the one hand, and its less than satisfactory increases in pension fund assets, on the other.

This article is structured in five sections. Section one contains the background to the study. Section two contains a review of relevant literature and a discussion of hypothesis development for the study. Section three presents the methodology that was adopted for the study. Section four contains the empirical results of the data analysis and a discussion of the results. Section five presents policy implications of the study findings.

Literature Review and Hypothesis Development

Unfunded pension schemes are subject to demographic, wage and longevity risks since expenditure is financed by the contributions of the working population. For this reason, Alonso-Garca (2017) and Wanger (2021) urge policymakers to ensure that pension contributions by workers during their working life correspond with pension rates at retirement and be managed well, to the extent that there is adequate liquidity. These authors posit that this financial performance requirement prompted most developing countries, particularly Nigeria, to transition from a DBS to a DCS.

Hsin and Mitchell (1995) found that administrative cost in pension fund management rises less as the size of an individual pension plan grows because of investments. As a pension fund expands, the cost incurred on the pension plan is less. The authors argue that a larger pension plan allows for substantial cost saving. Moreover, Caswell (1976) claims that as the administrative cost increases, the total value of pension

assets and the number of contributors also increase. Cooper *et al.* (1984) used the Cobb–Douglas cost function to determine pension system operating expenses and obtained evidence that the number of contributions, net pension assets and the annual contribution value appear to be based on scaled economies.

Wang and Zhu (2022) argue that owing to the long accumulation of a DCS, the inflation rate cannot be ignored during the investment period. They note that inflation can be affected by fluctuations in the financial market and hence propose an optimal asset allocation problem for DCSs, with stochastic wages under inflation risk. In addition, Xiaohua (2022) found that in almost all provinces of China, the revenue of public pension funds that are defined benefit schemes does not cover expenditure, which points to challenges in the financial performance of the China Pension Insurance System. Against this background, the following hypothesis is posited:

Hypothesis 1: Pension cost, revenue and the inflation rate are unlikely to have a statistically significant relationship with benefits paid.

Wanger (2021) explains the rationality assumption of neoclassical economics as applied to DCS pension participants**.** According to Wanger, the degrees of rationality are often limited by demographic and market realities, and the levels of education and information at the disposal of the contributors often make a mockery of the rationality assumption. He further posits that the efficient market hypothesis (EMH), based on its postulation, supports fairness in pension payments, with a relationship to economic growth in the markets that pension funds have been investing in. The EMH posits that information is a major limitation in financial decision-making, particularly in the case of financially illiterate investors. The EMH indicated that for any pension system, particularly DCSs indicate its ability to combine goal with constraints (Wanger, 2021). Wanger (2021) notes that pension design can be examined using target returns, assets allocations, cash flows, fund manager selection and incurred expenses, which translate to forgone opportunities and the design risk composition. Tonks's study (2005) on the performance persistence of pension fund managers in the UK showed strong evidence of significant performance of fund managers in the short term and weaker evidence of persistent performance in the

long term. Consequently, based on the above-mentioned literature, the following hypothesis is formulated:

Hypothesis 2: Pension cost, revenue and the inflation rate are unlikely to have a statistically significant relationship with inflow contribution.

Alonso-Garca (2017) and Wanger (2021) claim that there are challenges that hinder the sustainability of pay-as-you-go public pension systems. These challenges include an inadequate income for pensioners in their retirement phase; the absence of a fair level of payment in respect of the contributions paid by participants of pension systems; and pension systems that are not financially sustainable.

Boado-Penas *et al.* (2020) assert that countries are better off under a mixed pension system from a DBS to a DCS. Moreover, Wanger (2021) argues that a DBS guarantees retirement income adequately but is risky and expensive to manage, whereas a DCS comes with the risk of inadequate retirement income since the portfolio value in the retirement stage may not be sufficient to provide an adequate retirement income, except if the DCS investors applied optimal allocation strategies and raised the contribution rate (Forsyth & Vetzal, 2019).

Bulow (1982) observes that a corporate pension liability, which is an employment benefit, can be analysed based on the valuation of an ordinary corporate bond, which depends on the terms of the contract, dates and amounts of interest and principal payments, call prices, seniority of the debt and property alienation to security holders. Based on the above-mentioned literature, the following hypothesis is formulated:

Hypothesis 3: Federal government bonds, securities, contribution, revenue and the inflation rate are unlikely to have a statistically significant relationship with investment income.

Financial Performance Adequacy of Pension Fund Managers

The measurement of organisational performance is tied to organisational purpose. Thus, the purpose of pension fund managers is to maximise pension fund value, subject to liability-related and operational risk constraints (Ambachtsheer *et al.*, 1998). There are three drivers of fund performance, namely, fund size, the

proportion of assets that is passively managed and the quality of the fund's organisation design (Ambachtsheer *et al.*, 1998).

Tonks (2005) found that the average performance of pension funds, relative to external benchmarks, is rather poor. Regarding the performance persistence of pension fund managers, Blake *et al.* (1999) argue that, in the UK, pension funds that have the same single fund manager over their length of operation are likely to bring survivorship, although pension funds may continue to hire the same fund management house if its operational performance satisfies the pension fund trustees. The authors express the view that survivorship bias is likely to affect performance evaluation.

Furthermore, Wanger (2021) identifies parameters for evaluating a defined contribution pension design, which include automatic enrolment (fighting procrastination); regular dynamic asset allocation adjustment until retirement; higher replacement ratio; workplace financial education; median number of asset-allocation changes; different saving rates for males and females; and life cycle (target-date) funds. Wanger (2021) also identifies some of the main defects of a DCS, which include its voluntary outlook, inherent default behaviour, endorsement effect (herding) and inertia.

Davis (2005) illustrates the relevance of the DCS using optimal investment, by choosing a trade-off between low risk and higher return. The author states that pension funds derive major benefits from international investment, but 60 per cent of most country's pension assets is in its home market.

Overview of the Pension Industry in Nigeria

The NPC regulates and supervises the Nigerian pension industry in a transparent and consultative manner, specifically through regulatory and supervisory activities that cover surveillance; compliance and enforcement; investment monitoring; and the maintenance of a databank on pension matters. All regulatory and supervisory activities are targeted at achieving a sound and sustainable pension industry (NPC, 2020). A breakdown of the pension fund operators that are pension managers is provided in Table 1.

Table 1: Number of Pension Fund Managers Per Year

Pension operators	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Pension fund administrators	5	8	8	10	12	15	18	21	21	21	21	21	22	24
Pension fund custodians	2	2	2	4	4	4	4	4	4	4	4	4	4	5
Closed pension fund administrators	-	-	-	-	4	4	4	7	7	7	7	6	6	6
Total	**7**	**10**	**10**	**14**	**20**	**23**	**26**	**32**	**32**	**32**	**32**	**31**	**32**	**35**

Source: *NPC annual report 2020*

Membership of Pension Schemes

The total membership of the pension schemes increased from 8 469 257 members as at 31 December 2018 to 8 949 536 members as at 31 December 2019, representing an increase of 5.67 per cent. The membership of retirement savings account (RSA) schemes dominated the total pension scheme membership at 8 891 236, representing 99.35 per cent of members. The membership of approved existing schemes (AESs) and closed pension fund administrators (CPFAs) accounted for the balance of 0.65 per cent of members at 40 951 and 17 349 members, respectively (NPC, 2019).

The RSA registrations increased from 8 410 184 as at December 2018 to 8 891 236 as at 31 December 2019, representing a growth rate of 5.72 per cent (481 052). This growth was attributed to several factors. These factors include an increase in the level of compliance by the private sector as a result of the various steps taken by the NPC to improve compliance and coverage (such as engagement of recovery agents), as well as marketing strategies of the pension fund managers. The enforcement of the obligation that the Public Procurement Act of 2007 places on bidders for federal government contracts to provide evidence of compliance with the PRA also contributed to the increase in membership (NPC, 2019).

Following the launch of the Micro Pension Plan (MPP) in March 2019, registration for the MPP commenced. The RSA registration count for participants stood at 39 686 as at 31 December 2019. It was expected that the number of RSA registrations would continue to grow to improve scheme membership through the sustained implementation of the MPP in 2020 (NPC, 2019).

The membership of CPFAs and AESs was 17 349 and 40 951, respectively, as at 31 December 2019. While the membership of AESs remained the same at 40 951 between 2018 and 2019, that of CPFAs marginally declined by 4.27 per cent, from 18 122 in 2018 to 17 349 in 2019. The stagnation in the membership of AESs and the marginal decline in the membership of CPFAs were partly attributable to the closure of the schemes to new members in accordance with Sections 50(1) and 51 of the PRA (NPC, 2019).

Research Methodology

Research Design

The study took the form of epistemological research. A deductive approach was adopted, which involved formulating hypotheses and subjecting those hypotheses to empirical investigation using the annual data of the NPC, which were panel data. The data were analysed using the augmented Dickey–Fuller test (unit root test). Autoregressive distributed lag (ARDL) regression was used to test the hypotheses.

Sources of Data

The study relied on secondary data obtained from the annual reports of the NPC and the National Bureau of Statistics (NBS) of Nigeria.

Financial Performance Adequacy Analysis

To determine pension fund managers' performance using secondary data, data were collected from the NPC's annual reports over the period 2007 to 2020. The performance analyses were measured using benefits paid to pensioners, inflow contribution and investment income as variables.

Model Specification

Based on the hypotheses indicated in the literature review section, the following models of the financial performance adequacy of pension fund managers are formulated:

(i) Benefits Paid = β_0 + β_1(Pension Contribution Cost) + β_2(Pension Administration Cost) + β3(Revenue) + β_4(Total Assets) + β_5(Control Variables) + ui

(ii) Inflow Contribution = β_0 + β_1(Pension Contribution Cost) + β_2(Pension Administration Cost) + β_3(Revenue) + β_4(Total Assets) + β_5(Control Variables) + ui

(iii) Investment Income = β_0 + β_1(FG_Bond) + β_2(Other Securities) + β_3(Revenue) + β_4(Total Contribution) + β_5(Control Variables) + ui

The Dependent Variables

The dependent variables in the study were benefits paid (Model 1), inflow contribution (Model 2) and investment income (Mode 3).

The Independent Variables

The independent variables for Models 1 and 2 were other pension costs, administrative pension costs, revenue, inflation rate and total contribution. The independent variables for Model 3 were federal government bond (Treasury bill), other securities, revenue and total contribution, as well as control variables, such as inflation rate, gross domestic product (GDP) and the number of members, that is, contributors to the pension funds.

Table 2: Definition of Variables

Variable	Description
Coint. equ.	Cointegration equation, which is constant with error correction term
ADF test	The augmented Dicky–Fuller test, which is a unit root test
ARDL	Autoregressive distributed lag
Investment income	Yearly amount accrued as a return on the investment of pension contributions of members
Inflow contribution	Amount paid yearly by pension fund contributors
Benefits paid	Amount paid yearly to those who have retired from service
Administrative pension costs	Total cost incurred for administration in the management of pension funds
Other pension costs	Other costs incurred, excluding administrative costs
Federal government bond	Investment of pension funds in Treasury bills and bonds
Other securities	Investment of pension funds in capital markets
Total contribution	Total amount of funds contributed by contributors yearly
Revenue	Total amount generated by the federal government yearly
Inflation rate	Inflation rate per year; a control variable
Number of members	Yearly total number of contributors to pension funds; a control variable
GDP	Gross domestic product per year; a control variable

The Results of the Data Analysis

The results of the augmented Dickey–Fuller test (unit root test) are presented in this sub-section. This test was applied to indicate whether the variables were stationery or not.

Results of the Augmented Dickey–Fuller (ADF) Test (Unit Root Test)

Tables 3 and 4 indicate the results of the ADF test in respect of the variables in Models 1 and 2, respectively.

Table 3: ADF Test (Unit Root Test) for the Variables in Models 1 and 2

Variable	Level	First Difference	Order of Integration
Benefits paid	-2.93**	-6.23***	I(0)
Inflation rate	-2.77*	-3.97***	I(0)
Inflow contribution	-2.76*	-6.71***	I(0)
Other pension costs	-7.26***	-10.95***	I(0)
Revenue		-2.96**	I(1)
Total contribution		-52.73***	I(1)
GDP	-3.03**	-4.46***	I(0)
Number of members	-0.29	-31.89***	I(1)

Table 4: Units Root Test for the Variables in Model 3

Variable	First Difference	Order of Integration
Investment income	-14.79	I(1)
Federal government bond	-4.86	I(1)
Other securities	-5.49	I(0)
Revenue	-8.67	I(1)
Total contribution	-6.12	I(1)
Inflation rate	-4.73	I(1)
GDP	-3.03	I(0)
Number of members	-0.29	I(1)

The unit root test results in respect of Models 1 and 2, as shown in Table 3, indicate that the variables benefits paid, inflation rate, GDP, inflow contribution, other pension costs and administrative pension costs are stationary at a zero level, that is, they are in a I(0) series. The other variables, namely, revenue and total contribution are stationary at first difference I(1)—that order of cointegration was at the first difference.

The unit root test results in respect of Model 3, as shown in Table 4, indicate that the variables investment income, federal government bond, revenue, total contribution and inflation rate are stationary at first difference I(1)—this suggests a long-term effect. However, other securities and GDP have a stationary effect at level I(0). Based on this result, ARDL regression is very important.

Table 5: ARDL Bounds Cointegration Test for the Models

Estimated Model	F-test	
Model 1: Benefits paid	2.852954	
Model 2: Inflow contribution	1.523202	
Model 3: Investment income	1.576553	
Critical value 5% level	Lower bound	Upper bound
5%	2.62	3.79
5%	2.62	3.79
5%	2.62	3.79

Table 5 shows that the F-statistics for Models 1 and 2 and 3 are greater than the upper limits at a five per cent level of significance—therefore, there is a long-term statistically significant relationship in respect of Model 3, whereas there are short- and long-term statistically significant relationships in respect of Models 1 and 2.

Results of the ARDL Regression Analysis for Models 1 and 2

This sub-section presents the results of the ARDL regression analysis of Models 1 and 2. The results are indicated Tables 6 and 7.

Table 6: ARDL Regression Analysis of the Financial Performance Adequacy of Pension Fund Managers: Dependent Variable: BENEFIT_PAID for Model 1

Variable	Short Term	Long Term
Coint. equ.	-0.72***	
	(0.00)	
Inflation rate	-69.93	-97.08
	(88.64)	(123.04)
GDP		0.083***
		(6.84)
Number of members		0.002***
		(309.99)
Other pension costs	-10.01***	-13.90***
	(0.02)	(0.02)
Administrative pension costs	57.15***	17.47****
	(0.03)	(0.04)
Revenue	0.01	-0.07
	(0.04)	(0.01)
Total contribution	0.19	0.26
	(1.99)	(2.76)

*** and **** imply significant levels at 5% and 1%, respectively. Figures in parentheses represent the standard errors of variables.*

Table 7: ARDL Regression Analysis of the Financial Performance Adequacy of Pension Fund Managers: Dependent Variable: INFLOW_CONT for Model 2

Variable	Short Term	Long Term
Coint. equ.	-0.67***	
	(0.00)	
GDP		0.083***
Number of members		(6.80)
Other pension costs		0.002***
		(309.99)
		-10.86***
	-7.28***	(0.02)
	(0.02)	
Administrative pension costs	61.10***	15.48***
	(0.03)	(0.05)
Revenue		0.05
	0.03	(0.06)
	(0.04)	
Total contribution	-0.16	-0.24
	(1.92)	(2.87)

*** and *** imply significant levels at 5% and 1%, respectively. Figures in parentheses represent the standard errors of variables.*

Table 6 provides the results of the ARDL regression analysis of the financial performance adequacy of pension fund managers using benefits paid as the dependent variable and inflation rate, other pension costs, administrative pension costs, revenue and total contribution as the independent variables. Table 6 indicates that if other pension costs incurred are lower, then benefits paid will be lower in both the short- and long-term. This is because other pension costs have a negative statistically significant relationship with benefits paid. Consequently, it may lower the performance of pension fund managers, which may have an impact on what is deemed adequate financial performance for future sustainability. However, administrative pension costs have a positive statistically significant relationship with benefits paid in both the short- and long-term, which shows persistence in the performance of pension fund managers. The result also implies that if higher benefits are paid, there may be a higher cost on pension administration. The result supports Ping-Lung and Oliva's (1995) view that reducing the cost of public pension funds without cutting the quality of the retirement services provided by these plans is an important issue of public concern globally. Moreover, revenue generated increases

the benefits paid to pensioners or retirees; the total contribution from members also increases the benefits paid.

Table 7 illustrates the ARDL regression analysis of the financial performance adequacy of pension fund managers using inflow contribution as the dependent variable and inflation rate, other pension costs, administrative pension costs, revenue and total contribution as the independent variables. The results indicate that other pension costs have a negative statistically significant relationship with inflow contribution. This finding suggests that the lower the other pension costs incurred, the lower the inflow from contributions in both the short and long term. However, when administrative costs increase, the inflow from contributions also increases. This result is consistent with Alda's (2016) finding in respect of conventional and socially responsible pension funds in the UK that pension contributory inflow is a determinant of the performance ability of pension fund managers. The evidence implies that when the inflow of contributions decreases, fewer amounts are incurred on other expenses that are related to pension cost and higher administrative cost increase the inflow of the contributors.

In addition, revenue generated increases the inflow from contributions. However, total contribution reduces the inflow owing to other pension costs and administrative pension costs incurred—these costs reduce the inflow to pension funds.

Results of the Regression Analysis for Model 3

The results in respect of the relationship between federal government bonds, other securities, revenue, total contribution, inflation rate and investment income, as indicated in Hypothesis 3, are presented below.

Table 8: Regression Analysis for Model 3: Dependent Variable – Investment Income

Variable	Result
Coint. equ. (-1)	-0.43*** 0.14 (3.09)
Federal government bond	177.96*** 41.64 (4.27)
Other securities	210.91*** 77.10 (2.70)
Revenue	10.57*** 4.65 (2.27)
Total contribution	1399.43*** 478.51 (2.92)
GDP	0.083 *** 0.012 (6.84)
Number of members	0.002*** 0.000 (309.99)
Inflation rate	-12142.67*** 6026.03 (2.02)

*** and **** imply significant levels at 5% and 1%, respectively. The numbers with significant levels are coefficient values, and the middle numbers are the standard errors. The numbers in parentheses refer to T-statistics.*

Table 8 indicates the results of the regression analysis in relation to the last hypothesis where the effect of total assets, namely, federal government bond, other securities, revenue and total contribution, and control variables, namely, inflation rate, number of members and GDP on investment income was determined. The analysis revealed that federal government bond, other securities, revenue, total contribution and all the control variables have a positively significant relationship with investment income. This result suggests that if pension fund managers invest more of pension funds in federal government bonds such as Treasury bills and other securities in the capital markets, there is an increase in investment income; with increase the inflation rate, GDP and number of members' contributors who registered with pension funds managers, as well as revenue and the total contribution to the pension fund. The result provides evidence of what is presently

happening in the country. The federal government is investing heavily in Treasury bills and securities in the capital markets, using the assets of pension funds. The pension contributions from members also increase as the investment income increases. More employees and employers are registering with pension funds managers, leading to an increase in contributions and investment income. Moreover, the revenue from the federal government is higher as a result of higher investment income in payment of the returns on investments to various contributors. Further, the inflation rate is higher with increase in GDP, resulting in a higher value of investment income.

Conclusion

This article examined the financial performance adequacy of pension funds managers in the context of a developing country using data collected from the annual reports of the NPC and the NBS in Nigeria. From the results indicated in Table 6 it was concluded that there is a statistically significant relationship between benefits paid and all pension costs and revenue. This result provides evidence that, in both the short and long term, higher other pension costs will lead to lower benefits paid. This is because pension costs have a negative statistically significant relationship with benefits paid. Therefore, as much as the pension costs are above the inflow allowed, the benefits paid to pensioners may be lower; this may hinder the performance of pension fund managers. However, administrative costs incurred on pension funds have a positive statistically significant relationship with benefits paid in both the short and long term.

The results indicated in Table 7 provide evidence that other pension costs decrease if the inflow from contributions decreases. However, pension costs on administrative costs increase when the inflow from contributions rises. This result implies that pension fund managers incurred more costs on administration, which may affect their financial performance adequacy for future sustainability.

From the results indicated in Table 8 it was concluded that federal government bonds, other securities, total contribution to pension funds, the inflation rate, the GDP and the number of contributors to pension funds promote increased in

investment income. This result implies that pension fund managers diversified their portfolios by investing in federal bonds such as Treasury bills and other securities locally. This result is consistent with Davis's (2005) finding that that 60 per cent of countries around the world invest their pension assets in local markets. Defau and De Moor (2021) note that pension funds have started to invest more in alternative assets such as Treasury bills and securities, that is, they show increasing interest in portfolio diversification. Furthermore, Tonks (2005) found that there is persistence in abnormal returns by UK fund managers in the short term and a reduction in returns in the long term.

Policy Implication

From the evidence provided in this study it is clear that there is a need for regulatory bodies, such as the NPC and the Securities Exchange Commission, to regulate pension fund assets. The DCS that is currently used in Nigeria is likely to face market turbulence, and pension fund contributions may be inadequate owing to the high rate of job losses in Nigeria. Therefore, the regulatory bodies need to implement greater enforcement in the form of rules, guidelines and regulations concerning the investment of pension fund assets. Pension fund managers should receive training in order to improve their performance in respect of the investment of pension fund assets.

Greater attention should be paid to the risk associated with the investment of pension fund assets to avoid investment losses. The regulatory bodies should introduce more prudential guidelines regarding the pension costs that are incurred in pension fund management so that a balance can be achieved between costs incurred, inflow contribution and benefits paid to pensioners or retirees. Pension fund managers must be monitored by regulatory bodies to ensure that they invest in real assets that could militate against inflation instead of nominal assets that could be eroded by unexpected increases in the inflation rate.

Future research could focus on the determinants of the selection of pension fund managers by pension fund contributors to identify the factors that play a role when pension fund contributors decide which firms would be able to manage their pension

funds the best. Another area of further research is the effect of regulatory bodies of pension funds on the performance of pension fund managers. These two research areas have a nexus with the financial performance adequacy of pension fund managers in the Nigerian context.

References

Ackert, L. & Deaves, R. (2016). Understanding Retirement Saving Behaviour in Wanger (2021) The lifecycle Hypothesis and Nigerian Pension Industry: A review. *Academia Letters.*

Alda, M. (2016). Flows impact on Pension Fund: Evidence from UK Conventional and Social Responsible Pension Funds, *The Spanish Review of Financial Economic,* Vol. 14(2):57-65.

Alda, M., Andreu, L. & Sarto, J.L. (2017). Learning about individual managers performance in UK pension funds: The important of specialization, *The North America Journal of Economics and Finance,* Vol. 42(1):654-667.

Alda, M (2018). Pension Fund Manger Skills over Economic Cycle: The Non-Specialisation Cost, *The European Journal of Finance*, Vol. 24(1):36-48.

Alonso-Garca, J. (2017). Adequacy, Fairness and Sustainability of Pay as you go Pension System; Define benefits and Defined contribution, *The Journal of Finance,* Vol. 24(13):1100-1122.

Bulow, J.I. (1982). what are Corporate Pension Liabilities? *The quarterly Journal of Economics,* Vol. 97(2):435-452.

Ambachtsheer, K., Capelle, R. & Scheibelhut, T. (1998). Improving Pension Fund Performance, *Financial Analysis Journal,* Vol. 1(1):1-21.

Ballester, C. (2014). Determinant of Equity Pension Plan Flows, *Estudios de Economia,* Vol. 41(1):125-148.

Blake, D., Lehmann, B. & Timmermam, A. (1999). Assets Allocation Dynamics and Pension Fund Performance, *Journal of Business,* Vol. 72(1):429-461.

Boado-Penas, M.D., Godinez-Olivares, H., & Serrano, S.H. (2020). Automatic balancing mechanism for mixed pension scheme under different investment strategies, *European Journal of Finance,* Vol. 26(2-3):277-294.

Caswell, J.W. (1976). Economic Efficiency in Pension Plan Administration: A study of the Construction Industry, *Journal of Risk and* Insurance, Vol. 43(1):257-273.

Clark, G.L. (2022). The Problematic Nature of UK Pension Fund Regulation: Performing Governance at the Expenses of Innovation, *Compensation and Change,* Vol. 26(1):125-142.

Cooper, R.D., Grabb, C.A. & Carlsen, M.A. (1984). *Pension Fund Operations and Expenses.* The Technical report. Milwaukee, WI: International Foundation and Employee benefit Plans.

Davis, P. (2005). Pension Fund Management and International Investment: A global Perspective, *Pensions,* Vol. 10(3):236-261.

Defau, L. & De Moor, L. (2021). The investment behaviour of pension funds in alternative assets: Interest rates and portfolio diversification, *International Journal of Finance and Economics,* Vol. 26:1424-1434. DOI: 10.1002/ijfe.1856

Erzurumlu, Y.O. & Ucardag, I. (2021). Private Pension Fund Flow, Performance and Cost Relationship under Frequent Regulation Change, *Journal of Financial Regulation and Compliance,* Vol. 20(2):218-234.

Forsyth, P. & Vetzal, k. (2019). Defined contribution plans: Who has seen the risk? *Journal of Risk and Financial Management,* Vol. 12 (70):1-27.

Hsin, P & Mitchell, S.O (1995). *Public Pension Plan Efficiency.* Wharton Pension Research Council Working Papers 608. The Wharton School University of Pennsylvania.

Ifenna, I.S. & Arinze, O.C. (2020). Pension Fund Administrators and Financial Transparency, *International Journal of Research Publication,* Vol. 58(1):35-55.

Chu, P.K. (2008). Chapter 19: Performance Persistence of Pension Fund Managers: Evidence from Hong Kong Mandatory Provident Funds in Kim, S.J and Mckenzine, M.D (Ed,) Asia-Pacific Financial Markets: Integration, Innovation and Challenges, *International Finance Review,* Vol. 8:393-424.

Lakonishok, J.A., Shleifer, A. & Vishny R.W. (1992). The structure and Performance of the Money Management Industry, *Brooking Papers on Economic Activity*. 339-391.

Li, Z & Cowton, C.J. (2022). Defined Benefit Pension De-Risking Strategy: Determinants of Pension buy-ins, *Accounting Forum,* Vol. 46(1):1-60.

Mittelstaedt, H.F. & Olsen, J.C. (2003). An empirical Analysis of the Investment Performance of the Chilean Pension System, *Journal of Pension Economic and Finance,* Vol. 2(1):7-24.

National Pension Commission (NPC). (2019). National Pension Commission Annual Report Abuja (online), available from: https://www.pencom.gov.ng/category/publications/annual-reports/ [Accessed 5 March 2023].

Otero-Gonzalez, L., Dura-Santomil, P., Lado-Sestayo, R. & Vivel-Bua, M. (2021). Active Management, Value Investing and Pension Fund Performance, *European Journal of Management and Business Economics,* Vol. 30(3):299-317.

Tonks, I. (2005). Performance Persistence of Pension Fund Managers, *Journal of Business,* Vol. 78(5):1917-1942.

Wanger, B. (2021). The lifecycle Hypothesis and Nigerian Pension Industry: A review. *Academia Letters,* Article 1113. DOI:10.20935/AL1113

Wang, X. & Zhu, Y. (2022). Optimal control of defined contribution pension plan under uncertain optimistic value criterion, *International Mathematical Forum,* Vol.17(1): 25-32. DOI:10.12988/imf.2022.912302

Xiaohua, C. (2022). The impact of important Policy on the Financial Situation of China's Public Pension Fund: A Literature Review, *South Asian Research Journal of Business and Management, Vol*. 4(2):45-51.