EFFECT OF PENSION INVESTMENT ON FINANCIAL DEPTH IN NIGERIA: EMPIRICAL INVESTIGATION

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Abstract
This study examined the effect of pension investment on financial dept in Nigeria. The study adopted an ex-post facto research design. The population of the study is 14 years of Nigeria economy from the year 2007-2020. Time-series data were sourced for this study which are entirely secondary data from the Pension Commission and the Central Bank of Nigeria (CBN) statistical bulletin, and the World development indicator (WDI) of the World Bank Database. Autoregressive Distributed Delay Limitation (ARDL) bounds testing approach was adopted to examine the long- and short-term relationships between the series, using Eview 12 version. The result of the hypothesis shows that there is evidence that pension investment in equities has positive relationship with financial deepening. This implies that increases in pension investment in equities will lead to increase in financial depth in Nigeria. In sharp contrast, pension investments in FGN securities, local money market securities and mutual funds have a negative relation with financial depth. This implies that increases in pension investments in FGN securities, local money

market securities and mutual funds will lead to decrease in financial depth in Nigeria. The result also shows that in the short run that pension investments in equities and mutual funds have positive but insignificant relationship with financial depth, while FGN securities and local money market securities have negative and insignificant relationship with financial depth. The study then recommended that, to accelerate financial sector depth, it is necessary for the financial sector regulators and policymakers to strengthen the depth of banks asset, other financial institutions and financial markets through policies and reforms to attract more pension investment that will contribute to the development of Nigeria's financial stance.

Keywords: *financial depth; financial institutions; financial sector development; pension fund; pension investment.*

JEL Classification: G11

Introduction

The reforms in pension administration all over the world have been of tremendous importance to mobilise 'invisible' funds. Pension funds do accumulate and are subsequently invested which over time has helped the capital market as well as the government in meeting their immediate fund needs. The reform agenda has a clear and well-articulated set of goals, which include weakening the growth of pension liabilities, ensuring timely payment of benefits, instilling thrift in Nigerians as they approach retirement, and developing a simple, transparent, and sustainable pension system (Anaesoronye, 2010; Onwuamaeze, 2011). It can also decipher from the modification agenda; an indirect aim of the scheme is the advancement of the financial sector of the nation's economy.

Pension systems have become a cause of macroeconomic unsteadiness, a limitation to economic growth, and an ineffective or multiple providers of retirement income (World Bank, 2006). In the same vein, pension fund accumulation has been linked to the poor state of financial development which is evident in countries that have adopted an accumulated pension fund system (World Bank, 2006).

For instance, financial depth is not a function but is a representation of the overall expansion of the services provided by the financial system. Similarly, the measures available for access do not directly measure how well the financial system identifies good investments, regardless of the individual's guarantees; but

provide an approximation of the use of various financial institutions and instruments (Čihák, Demirgüç-Kunt, Feyen & Levine, 2013).

Annan (2020) opined that financial development can be measured by a variety of factors, including the depth, size, accessibility, and robustness of the financial system. This can be measured by examining the performance and activity of financial markets, banks, fixed income markets, and financial institutions. It has been observed that the greater a country's level of financial development, the more financial services are available. The developed financial system provides higher returns while posing lower risk (Annan, 2020). The foregoing interest the researchers to study the effect of pension investment on financial depts in Nigeria.

Literature Review
Pension Investment in Nigeria

Pension, according to Ozor (2006) and Eneogu (2012) is a periodic income paid after retirement to an employee who has served for certain years and retires because of age, earnings, and length of service and payments are mostly on monthly basis. It is one of the three means of providing for the post-service life of employees. The other two are personal savings and state sponsor social security. Neil (1977) and Fashagba and Ayodele (2011) opined that incorporation of pension into employment conditions can help to improve productivity. Meeting employees' reasonable needs, including pension, in their current employment determines their length of stay, which has a significant impact on the organisation's well-being and productivity.

The motive of a pension scheme is to provide the personnel of an organization with a method of securing retirement, a standard of living moderately consistent with that they enjoyed even as in service. According to Akhiojemi (2004), it is the totality of plans, procedures, and legal processes of securing and placing apart finances to meet the social obligations of care which employers owe their personnel on retirement or in case of loss of life.

Pension Fund Managers (PFAs) invest money in stocks and other securities and investment assets on behalf of RSA holders to ensure value gains. They also save for retirees, protect assets, fund pension schemes, and cover retirees' costs (Wallick, Julieann, Christos & Joanne, 2012). To meet the different needs of retirees or to ensure fund performance that is within the existing regulatory provisions, PFAs take investment decisions considering the internal and external environment, objective setting, risk assessment, risk response, control activities, risk appetite, information and communication, and regulatory review.

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Pension Fund Custodians are responsible for housing the pension fund's assets. It is expected that PFAs will never hold the assets of the pension fund. The employer sends the contribution directly to the trustee/custodian, the trustee notifies the PFA of receipt of the contribution, and the PFA deposits the contribution into the employee's retirement savings account. Custodians carry out transactions and activities related to the management of pension investments under PFA instructions. The employer must deduct the contribution from the trustee and repay it within 7 days from the date the employee receives the salary. The Trustee, on the other hand, will notify the PFA within 24 hours of receiving the contribution. To track their activities, authorized operators must submit regular reports of their activities to PenCom. PFA and PFC must disclose their rate of return and publish their audited accounts.

Also, a seeming defect in Section 87 of the Pension Reform Act 2004 has been corrected in Section 101 of PRA 2014. Section 87 of PRA 2004 requires that every Pension Fund Custodian or Administrator shall render to the Commission monthly reports of any fraud, forgery, or theft occurring in its organization failing which it commits an offence and shall be liable on conviction to a fine of not less than N10,000,000 and each of its director or officer shall be liable to a fine, not less than N5,000,000 or imprisonment for a term not exceeding 3 years or both. The implication of this (not exceeding 3 years) is that the term of imprisonment could be one day! In Section 101 of the PRA 2014, the term of imprisonment has been amended to ''not less than 5 years''. Prosecution of offences is vested in the Federal and State High Courts, including the High Court of the Federal Capital Territory, as well as the National Industrial Court to ensure speedy dispute resolution and dispensation of justice as it relates to the offences stated in the Act.

The 2014 PRA Act provides that where there is a conflict between the provisions of the 2014 PRA and any other promulgation, the 2014 PRA shall prevail. Therefore, provisions of other legislation that seek to subject income attributable to pension funds to tax will no longer apply. As a result, pension funds invested in bonds and short-term government securities will continue to benefit from exemptions even after the ten-year tax-free timeframe accorded by the Companies Income Tax (Exemption of Bonds and Short-Term Government Securities) Order 2011 expires.

Financial Depth

According to Ndebbio (2000), financial deepening is defined as an increase in the supply of financial assets in the economy, and thus the sum of all financial asset measures gives us an estimate of the size of financial deepening. As a result, it is suggested that the financial sector is the channel through which financial deepening manifests itself (Asekunowo, 2009)

Kiyotaki and Moore (2005) in their models of financial deepening used the degree of trust in the economy and the ease of conversion of illiquid paper (after an initial acquisition) into a liquid paper as measures of financial depth. They referred to the latter as "securitisation or financial intermediation," and they claimed that if the trustworthiness is high and the costs of transforming to liquid paper are low, then an indicator of financial deepening has been achieved.

The Department for International Development (DFID) (2004) outlined the ways in which the financial sector can be adjudged to be developed or to have deepened and these include improvement in the efficiency and competitiveness of the sector, the variety of financial services offered may expand, as may may the diversification of institutions that function in the financial sector, as may the amount of money that is mediated through the financial sector, as may the magnitude to which capital is distributed by private-sector financial institutions to private enterprises responding to market signals (rather than government-directed lending by state-owned banks), as may the amount of money that is collateralized through the financial sector may increase, the regulation and stability of the financial sector may improve and more of the population may gain access to financial services.

In Nigeria, as part of the Structural Adjustment Programme (SAP), both the financial and the foreign sectors of the economy were deregulated. One of the goals of liberalising the financial sector was to raise the real rate of interest enough to allow domestic savings to be mobilised. In addition, an increase in the interest rate may stimulate portfolio capital inflows. It is therefore conceivable that the defined contributory pension scheme which was introduced at a later date could then serve as a shot in the arm towards the realisation of the goals of savings mobilisation, domestic financial instruments acquisition and portfolio investment inflow (financial deepening) (Asekunowo, 2009). Since the inception of the funded contributory pension scheme, one wonders if the depth of Nigeria's financial system has appreciably improved.

Rousseau and Wachtel (2008) in their study of the impact of financial deepening on economic growth used three measures of financial development, namely: liquid

liabilities less narrow money (M3 less M1), the ratios to GDP of liquid liabilities (M3), and credit allocated to the private sector. Lastly, Singh et al (2009) in their study of financial deepening in CFA Franc Zone captured financial depth as credit to the private sector in terms of GDP.

The funded scheme has the inherent potential to increase savings due to its contributory feature. According to the OECD (2005), institutional investors, particularly pension funds, mutual funds, and insurance, have increased their role as savers over the last few decades. It went on to say that this trend is likely to continue as retirement savings increase, and that increased pension saving will increase the size of capital markets. The large pool of savings that constitutes pension funds must be channelled into portfolios for reasonable returns in order to ensure retirees' (former affiliates') old-age liquidity and thus their old-age consumption (welfare). This necessitates a significant amount of financial intermediation in the financial sector. A convergence of the shortfall and surplus spending units is probable to result in further deterioration of the financial system (Ghani, 1992).

Review of Previous Empirical Studies

Odo, Ani, and Agbo (2021) researched the Contributory Pension Scheme and the Premium Base of the Nigerian Insurance Industry. The study examined the level at which the defined contribution pension system has contributed to the growth of the insurance industry's premium base. The study adopted an *ex-post-facto* (after-the-fact) research design. The study shows that the contributory pension scheme had a positive but insignificant impact on the growth of the insurance industry's premium base in Nigeria. The study, therefore, recommended that Nigerian pension regulators enforce strict compliance with the relevant provisions of the law for the insurance industry to experience the quantum growth expected.

Davis, Stewart and Knaack (2021) studied pension funds and financial repression. According to the study, pension funds are used as a captive audience in some economies to channel capital to the government at below-market rates. This policy is only one tool in the toolbox of financial repression, but it is gaining traction as governments around the world struggle to increase fiscal space and reduce their sovereign debt burdens as they rebuild their economies following the pandemic. First, from a historical standpoint, this paper examined financial repression using pension funds. It then assesses the policy's welfare and distributional implications, drawing on lessons learned from a variety of advanced and emerging economies. A general set of policy recommendations is elusive due

to the wide range of possible interventions and idiosyncratic country conditions, but the paper proposes four high-level principles that can help policymakers assess the costs and benefits of implementing policies that use pension funds as a captive audience for financial repression.

Musa (2020) examined the determinant of the 2014 Pension Reform Act in Nigeria: A study of Abuja workers and adopted a survey research design. 246 questionnaires were processed. The study aims to identify the impact of taxpayers 'decisions on the 2014 Pension Reform Act in Abuja, Nigeria, and to examine the impact of pensioners' living standards on the 2014 Abuja Pension Reform Act. Nigeria study shows that taxpayer decision-making has a positive and significant impact on the 2014 Pension Reform Act in Abuja FCT, while the standard of living of retirees has a negative and significant impact on the 2014 Pension Fund Reform Act in Abuja FCT. It recommended that the new 2014 Pension Reform Act continue to apply to workers and workers as workers make a good decision to use the plan to prevent future financial crises after retirement. The new Pension Reform Act of 2014 should be implemented with more emphasis on the standard of living of retirees, even if there have not been many plans for the standard of living of retirees.

Okoro and Okoye (2019) researched pension investment funds analysis: A variance-comparison tests of non-contributory (pre) and contributory (post) schemes in Nigeria. The research compared both non-contributory (pre) and contributory (post) pension schemes in Nigeria. Secondary data sources were used. The findings revealed that the contributory (post) system is healthy, dependable, and ready to assist retirees in surviving after they leave the service. As a result of the reform in Nigeria, the defined contribution system (post) has significantly improved, particularly in the area of pension funds. As a result, the study recommended that there be an endless retirement savings plan and that employers make no pension contributions to PENCOM; additionally, the return on investment and service delivery by pension fund managers should be improved in order to boost pension investment and voluntary contributions.

Ekpulu and Bingilar (2016) examined the theory test of the Nigerian pension fund. The specific objective of the study examined the historical expansion of pension funds in Nigeria, a certain aspect of the Pension Reform Act of 2004 and the current Act of 2014, possible regulatory options for investors when investing the pension fund, the pension fund, and economic growth as well as the net asset value of the Pension fund. By including the informal sector in the system and formulating responsive regulation to facilitate the rate of conversion into the

system, the prospects for a boost in the capital fund, that is, capital formation, are good. This suggests that there will be more long-term capital available for the execution of capital-intensive projects.

Adeoti, Gunu, and Tsado (2012) conducted a study to analyse the factors that influence pension fund investing. The study relied on primary data gathered using a questionnaire. A simple random sampling approach was used to choose respondents from a sample of five AFPs in Nigeria. A total of 125 questionnaires using Likert scales were processed. the collected data were analyzed. The author opined that the pension fund is a set of resources that are provided by employees to have sufficient resources to meet their needs after retirement. Investments were made to meet the contributor goal. According to main components, economic factors, risk, and property security were identified as the most important determinants of pension investment, it was concluded that the variable was like interest rate the internal control system is not critical in determining the investment of pension funds in Nigeria. The study also recommended that pension fund managers develop good systems to mitigate the enormous risks they face as investment managers.

Jörg (2010) analysed the first results of the Nigerian pension reform of 2004. In early 2010, the new system of privately financed and managed retirement accounts covered approximately 4 million Nigerians in a country of over 50 million people. The research focuses on the new system's flaws. More importantly, the reform did not provide basic social security in old age for the majority of Nigerians employed in the informal sector. In addition, the minority of covered workers are also likely to have problems. The study demonstrates in a computational model that funded accounts have so far produced negative real returns for savers. It is suggested that change inside the present paradigm is unlikely to fix the current system's flaws and that alternative solutions, such as universal non-contributory social pensions, should be considered to extend basic social security. in the Nigerian context.

Asekunowo (2009) investigated the impact of a funded contributory pension scheme on financial deepening and economic growth in Nigeria. Following a review of relevant literature, secondary data on relevant macroeconomic indices in the Nigerian economy were gathered. The information was analysed in a descriptive manner. TDS (total domestic savings) increased during the post-pension reform period, and the increase was not caused by GDP growth. Some financial deepening indicators, such as DCP/GDP (domestic credit to the private sector as a share of GDP), TBD/GDP (total bank deposits divided by GDP), and CIM (contract intensive money), did not improve significantly during this period,

pointing to poor intermediation in Nigeria's banking sector. However, the DCP/GDP + SMC/GDP measure (domestic credit to the private sector as a share of GDP plus stock market capitalisation as a share of GDP) improved significantly during this period, owing largely to the performance of the SMC/GDP measure. This implies that the Nigerian capital market experienced some depth during the post-pension reform period. As a result, despite the increased TDS that may have been derived from contributory pension funds, efforts must be intensified to increase the scheme's participation rate by including state employees and informal sector workers in the scheme. The poor performance of the DCP/GDP, TBD/GDP, and CIM measures must be reversed through strict enforcement of banking regulations, and the Nigerian judiciary must be truly reformed to enforce contract laws and protect private property rights. PenCom must be persuaded to relax the stringent portfolio diversification guidelines that PFAs are required to follow to further deepen the Nigerian capital market. This must be followed quickly by the internationalisation of the Nigerian capital market.
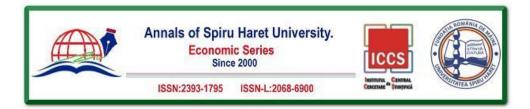
Theoretical Framework

This research is based on the theory of financial intermediation, which was first developed in the 1960s by Gurley and Shaw (Kigen, 2016). A financial intermediary is a third party who acts as a go-between in a financial transaction. It is critical to investigate the role of pension funds as intermediaries, as well as how they improve capital markets. According to proponents of the current theory of intermediation, while pension funds do not provide liquid liabilities, they play an important role in influencing the structure of securities markets and, as a result, improve the efficiency of financial systems.

Methodology

The study adopted an *ex-post facto* research design. The population of the study is 14 years of Nigeria economy from the year 2007-2020. Time-series data were sourced for this study which are entirely secondary data from the Pension Commission and the Central Bank of Nigeria (CBN) statistical bulletin, and the World development indicator (WDI) of the Worldbank Database. Autoregressive Distributed Delay Limitation (ARDL) bounds testing approach was adopted to examine the long- and short-term relationships between the series, using Eview 12 version.

The Long-run model is given as:

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$$LFDIDE_t = \Upsilon + \alpha_1\, LPENINVEQ_t + \alpha_2\, LPENINVFS_t + \alpha_3\, LPENINVLMMS_t$$
$$+ \alpha_4\, LPENINVMF_t + u_t \qquad (3.10)$$

To distinguish the short-run impact from long-run impact the error correction model framework is written as:

$$\Delta LFDIDE_t = \Upsilon + \sum_{i=1}^{N1} \delta_i\, \Delta LFDIDE_{t-k} + \sum_{j=0}^{N2} \eta_j\, \Delta LPENINVEQ_{t-k}$$
$$+ + \sum_{j=0}^{N3} \beta_j\, \Delta LPENINVFS_{t-k} + \sum_{j=0}^{N4} \theta_j\, \Delta LPENINVLMMS_{t-k}$$
$$+ \sum_{j=0}^{N5} \gamma_j\, \Delta LPENINVFS_{t-k} + \alpha_1\, LPENINVEQ_t$$
$$+ \alpha_2\, LPENINVFS_t + \alpha_3\, LPENINVLMMS_t + \alpha_4\, LPENINVMF_t$$
$$+ u_t \qquad (3.11)$$

To determine the speed of adjustment in a co-integrating ARDL model, equation (3.11) can be re-specified to include an error correction term as follows:

$$\Delta LFDIDE_t = \rho\varrho_{t-1} + \sum_{i=1}^{N1} \delta_i\, \Delta LFDIDE_{t-k} + \sum_{j=0}^{N2} \eta_j\, \Delta LPENINVEQ_{t-k}$$
$$+ + \sum_{j=0}^{N3} \beta_j\, \Delta LPENINVFS_{t-k} + \sum_{j=0}^{N4} \theta_j\, \Delta LPENINVLMMS_{t-k}$$
$$+ \sum_{j=0}^{N5} \gamma_j\, \Delta LPENINVFS_{t-k} + U_t \qquad (3.12)$$

Where:
LFDIDE = Financial development index to depth, LPENINVEQ = Pension Investment in Equities, LPENINVFS = Pension Investment in FGN Securities,

LPENINVLMMS = Pension Investment in Local Money Market Securities, and LPENINVMF = Pension Investment in Mutual Funds. Υ is the intercepts from equations 3.10-3.11, $\delta, \eta, \beta, \theta,$ and γ are the short-run coefficients and $\alpha_1 - \alpha_4$ are the long-run parameter for the explanatory variables, ρ is the coefficient of the error correction term which must be negative, t represents the periods under study, U_t are the error term.

Data Analysis and Presentation

To conduct the bounds test for co-integration approach within the ARDL framework, the optimal lag order must be determined. According to Enders (2003) too many lags incorporated into the testing equation may reduce the degree of freedom and the power of the test statistics, while too few lags may cause a misspecification problem. Table 1 revealed that the maximum lag for the model is two (2), however, before the maximum lag of two can be used there must be absence of autocorrelation, and these is reported in Panel B of Table 1. The result did not reject the null hypothesis of no autocorrelation, thus for the ARDL model estimation of pension investment and financial depth the maximum lag used is two.

Table 1. Diagnostic Test for Pension Investment and Financial Depth in Nigeria.

Panel A: Lag Order Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-6.6035	NA	1.08e-06	0.446289	0.633909	0.518218
1	253.1289	459.5265	1.30e-10	-8.58188	-7.456162*	-8.15031
2	287.5268	54.24295*	9.28e-11*	-8.943340*	-6.87952	-8.152121*
3	306.6788	26.51818	1.25e-10	-8.71842	-5.7165	-7.56755
4	318.2672	13.81683	2.41e-10	-8.20258	-4.26257	-6.69208

Panel B: Serial Correlation LM Test

Lag	LRE* stat	df	Prob.	Rao F-stat	Df	Prob.
1	26.72522	25	0.3697	1.081153	(25, 127.8)	0.3734
2	21.12032	25	0.6859	0.836912	(25, 127.8)	0.6887
3	14.68586	25	0.9484	0.568374	(25, 127.8)	0.9491

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4	69.26360	25	0.0000	3.292890	(25, 127.8)	0.0000
5	26.94024	25	0.3589	1.090720	(25, 127.8)	0.3625
6	33.14785	25	0.1274	1.373381	(25, 127.8)	0.1298
7	22.79230	25	0.5897	0.908745	(25, 127.8)	0.5930
8	57.63548	25	0.0002	2.619783	(25, 127.8)	0.0002
9	24.18627	25	0.5086	0.969297	(25, 127.8)	0.5122
10	11.77409	25	0.9883	0.450870	(25, 127.8)	0.9885

Source: Author, 2022

* indicates lag order selected by the criterion. LR: sequential modified LR test statistic (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion and HQ: Hannan-Quinn information criterion

Table 2. Pension Investment and Financial Depth in Nigeria.

Dependent Variable: LFDIDE
Panel A: Long -Run Estimates

Variable	Coefficient	S.E	t-stat	Prob
C	1.633	0.138	11.791	0.000
LPENINVEQ	0.211	0.100	2.115	0.041
LPENINVFS	-0.023	0.032	-0.715	0.479
LPENINVLMMS	-0.003	0.059	-0.053	0.958
LPENINVMF	-0.017	0.042	-0.409	0.684

Panel B: Short -Run Estimates

Variable	Coefficient	S.E	t-stat	Prob
D(LPENINVEQ)	-0.061	0.481	-0.128	0.899
D(LPENINVEQ(-1))	0.466	0.495	0.941	0.353
D(LPENINVFS)	-0.043	0.086	-0.497	0.622
D(LPENINVFS(-1))	-0.067	0.085	-0.791	0.434
D(LPENINVLMMS)	0.452	0.298	1.518	0.137
D(LPENINVLMMS(-1))	0.002	0.299	0.005	0.996

D(LPENINVMF)	0.017	0.047	0.369	0.714
D(LPENINVMF(-1))	-0.002	0.049	-0.036	0.972
ECM(-1)	-0.792	0.146	-5.437	0.000

Panel C: Diagnostic Tests	**Statistic**	**Prob.**
Bound Test	22.413	0.000
Serial Correlation	1.700	0.143
Heteroscedasticity	1.665	0.459
Linearity Test	3.032	0.215
Adjusted R-square	0.751	
	CUSUM	
Stability Test	Stable	

Source: Author, 2022

Notes: Table 2 examine the effect of pension investment on financial depth in Nigeria. The dependent variable is financial development index to depth (LFDIDE), while the explanatory variables are pension investment in equities (PENINVEQ), pension investment in FGN securities (PENINVFS), pension investment in local money market securities (LPENINSLMMS) and pension investment in mutual funds (LPENINVMF). The sample period is from 2007Q1-2020Q4. The estimation process was facilitated using Eviews 12.

Interpretation
Bound Test

The first condition to ascertain the possibility of long-run relationship for pension investment and financial depth is the bound test, the results shows that the bound test statistics of 22.413 is statistically significant at 1 per cent level. This is because the statistics of 22.413 is greater that the critical values of 4.26, 3.5 and 3.13 at 1 percent. This implies that there is possibility of a long run cointegrating relationship for pension investment and financial depth in Nigeria. Based on the possibility of a long-run relationship for pension investment and financial depth in Nigeria, the study then estimates the long-run and the short-run elasticity. The empirical results for the model for the effects of for pension investment and financial depth in Nigeria, in the short and long run are reported in Table 2.
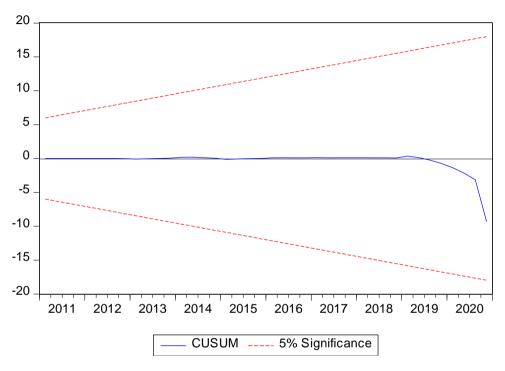
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Figure 1. Stability Test - Plots of Cumulative Sum of Residual.

The Long-Run Dynamics

The estimated long-run coefficients (elasticities) for the UECM model are given in Panel A of Tables 2. In the long run, there is evidence that pension investment in equities has positive relationship with financial deepening. This implies that increases in pension investment in equities will lead to increase in financial depth in Nigeria. Furthermore, there is evidence of a long-run significant relationship that pension investment in equities and financial depth in Nigeria (LPENINVEQ = 0.211, t-test= 2.115, ρ = 0.041). This implies that pension investment in equities is a significant factor influencing changes in financial depth in Nigeria.

In sharp contrast, pension investments in FGN securities, local money market securities and mutual funds have a negative relation with financial depth. This implies that increases in pension investments in FGN securities, local money market securities and mutual funds will lead to decrease in financial depth in

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Nigeria. Furthermore, there is no evidence of a long-run significant relationship that pension investments in FGN securities, local money market securities and mutual funds with financial depth in Nigeria (LPENINVFS = -0.023, t-test= -0.715, ρ = 0.479; LPENINVLMMS = -0.003, t-test = -0.053, p = 0.958, and LPENINVMF = -0.017, t-test= -0.409, ρ = 0.684). This implies that pension investments in FGN securities, local money market securities and mutual funds are not significant factors influencing changes in financial depth in Nigeria.

Concerning the magnitude of the estimated parameters, a 1 per cent increase in pension investment in equities will lead to 0.211 per cent increase in financial depth, while a 1 per cent increase in pension investments in FGN securities, local money market securities, and mutual funds will lead to 0.023, 0.003, and 0.017 per cent decreases in financial depth in Nigeria respectively in the long run.

To test the hypothesis for objective one, the bound test of 22.413 was used and it is statistically significant at 1 per cent level, thus on the overall, the null hypotheses that there is no significant effect of pension investment on financial depth in Nigeria was rejected and accept the alternative hypothesis that there is significant effect of pension investment on financial depth in Nigeria.

Short-Run Dynamics

The purpose of this section is for two reasons. First, is to examine if changes and the statistical significance experienced in the long run also exist in the short run model. Second, is to examine the degree of adjustment back to equilibrium using the error correction term. The short-run adjustment process is measured by the error correction term ECM_{t-1} and it shows how quickly variables adjust to a shock and return to equilibrium. For stability, the coefficient of ECM_{t-1} should carry the negative sign and be statistically significant.

The result shows that in the short run that pension investments in equities and mutual funds have positive but insignificant relationship with financial depth, while FGN securities and local money market securities have negative and insignificant relationship with financial depth. In addition, the estimated coefficient for the ECM_{t-1} reported in Panel B of 4.3 is negative and statistically significant (ECM= -0.792, t-test = --5.437, p = 0.000). This implies that deviations from pension investments in equities, FGN securities, local money market securities and mutual funds equilibrium path are corrected by nearly 79 per cent over the following quarter. In other words, the adjustment process is relatively high in Nigeria. The statistical significance of the ECM_{t-1} confirms the presence of long-

run equilibrium relationship between pension investment and financial depth in Nigeria.

The Adjusted R-square is 0.75; this implies that pension investments in equities, FGN securities, local money market securities and mutual funds explains about 75 per cent changes in financial depth, while the remaining 25 per cent were other factors affecting changes in financial depth but were not captured in the model.

Post-Estimation Test

For the validity and reliability of the parameter estimates and to be able to draw valid conclusions based on the results, four types of residual test were conducted. First, is the serial correlation test which is used to test for the possibility of the error term being uncorrelated.   Second, is to check if the finite variances of the error terms are equal. This assumption is referred to as the homoscedasticity. A violation of this assumption is referred to as heteroscedasticity. Third, is the linearity test, which is used to test if the model is linearly specified, the non-significance of the Ramsey RESET test implies the model is linear specified. Fourth, is the stability test, where the cumulative sum of residuals (CUSUM) is used. For the stability of the estimated model, the plot of CUSUM statistic must stay within a 5% significance level portrayed by two straight lines.

The results revealed that the successive error terms are not serially correlated because the probability value of F-statistic of 1.700 with a probability of 0.143 is not significant. Thus, the null hypothesis that there is no serial correlation in the residuals up to the specified lag orders at 1, 5 or 10 percent significant level is not rejected. The study concluded that the successive error terms were not correlated in the estimated model for pension investment and financial depth in Nigeria. Also, the heteroscedasticity results show that the F-statistic of 1.665 with a probability value of 0.459 is not statistically significant at either 1, 5 or 10 per cent levels of significance this implies that the null hypothesis of homoscedasticity could not be rejected; thus, there is evidence that the covariance of the error terms have a constant finite variance.

In addition, the Ramsey Reset Test, F-statistics of 3.032 with a probability value of 0.215 is not significant, thus, the model is correctly specified and that there is a linear relationship between pension investment and financial depth in Nigeria. Also, the CUSUM reported in Panel C and Figure 4.2 shows that that the estimated model is stable; because the plot of CUSUM statistic stays within a 5% significance level portrayed by two straight lines.

Discussion of Findings

This study examined the effect of pension investment on financial depth in Nigeria. The result of the hypothesis shows that there is evidence that pension investment in equities has positive relationship with financial deepening. This implies that increases in pension investment in equities will lead to increase in financial depth in Nigeria. In sharp contrast, pension investments in FGN securities, local money market securities and mutual funds have a negative relation with financial depth. This implies that increases in pension investments in FGN securities, local money market securities and mutual funds will lead to decrease in financial depth in Nigeria. The result also shows that in the short-run that pension investments in equities and mutual funds have positive but insignificant relationship with financial depth, while FGN securities and local money market securities have negative and insignificant relationship with financial depth.

These findings corroborate with the results of Wang, Li, Abdou, and Ntim (2015) that examined the nexus between financial development and economic growth. The empirical results revealed that development hurts economic growth in general, but on the growth of the tertiary sector. By contrast, it found that financial development has no substantial effect on the primary and secondary industries. Also, Bonizzi and Churchill (2017) examined the expansion and innovation of financial markets, commonly known as financialization, as they are closely related to the growth of pension funds. Although the conventional narrative is based on the idea of financial development as a positive change, they argue that annuity pension funds can create demand pressures on the financial system, creating the potential for systemic risk and instability. Therefore, the increase in pension funds is important for the financialization process, as the demand for the assets of these institutions continuously generates growth and innovation in the financial markets. In the current context, pension funds are trying to reduce risk by switching their allocation from stocks to "alternatives" such as hedge funds and private equity. stabilizing force in present financial markets.

Conclusion and Recommendations

The result from this study shows that in the short run, pension investments in equities and mutual funds have positive but insignificant relationship with financial depth, while FGN securities and local money market securities have negative and insignificant relationship with financial depth. From the findings of the study, the study concludes that pension investment in equity, pension investment in FGN

securities, pension investment in local money market securities and investment in mutual funds are significant determinants of financial sector development in Nigeria. In particularly, pension investment in Nigeria significantly reinforce financial sector development in the aspect of financial development depth.

The study then recommended that, to accelerate financial sector depth, it is necessary for the financial sector regulators and policymakers to strengthen the depth of banks asset, other financial institutions and financial markets through policies and reforms to attract more pension investment that will contribute to the development of Nigeria's financial stance.

References

[1] Adeoti, J. O., Gunu, U. & Tsado, E. (2012). Determinants of pension investment in Nigeria: The critical factors. *International Journal of Human Resource Studies,* 2(4).

[2] Akhiojemi, S. I. (2004). *Contributory Pension fund.* A paper presented on the new pension reform at ASCON Pension Board of Trustees in September. 2004.

[3] Anaesoronye, M. (2010). Only a fresh bill will safeguard over 70% of small Nigerian workers. *Business Day,* 118 (9).

[4] Asekunowo, V. O. (2009). Funded contributory pension scheme, financial deepening and economic growth: what does the evidence say so far about the Nigerian economy? *CBN Bullion*, 34(1), 35-46.

[5] Central Bank of Nigerian (CBN) (2019). 2018 Annual Statistical Bulletin. Retrieved from: https://www.cbn.gov.ng/documents/statbulletin.asp

[6] Čihák, M, A, Demirgüç-Kunt, A., Feyen, E., & Levine, R. (2013). Benchmarking Financial Systems around the World. NBER Working Paper 18946, National Bureau of Economic Research.

[7] Davis, R. M., Stewart, F. & Knaack, P. (2021). Pension funds and financial repression. *A report by the Finance Team of the World Bank, supported by the Government of the Grand Duchy of Luxembourg* 1-37

[8] DFID (2004). The importance of financial sector development for growth and poverty reduction. *Working Paper, DFID Policy Division*. Retrieved from: www.dfid.gov.uk/ Documents/publications/fsdbriefingnote.pdf

[9] Ekpulu, G. A. & Bingilar, P. F. (2016). Pension fund in Nigeria, an appraisal, *quarterly journal of contemporary research,* 1(2), 196-209.

[10] Eneogu, F. I. (2012). The new pension scheme and workers' productivity in Nigerian universities. A study of university of Nigeria, Nsukka. Unpublished M.sc Thesis.

[11] Fashagba, M. O. & Adeyele, J. S. (2011). The motivating influence of pension on employees in

[12] FGN (2005). Contributory pension scheme. A publication of federal ministry of information and national orientation.

[13] Ghani, E. (1992). How financial markets affect long-run growth: A cross-country study. *World Bank Working Paper Series 843, Operations Evaluation Department, Washington, D.C.*

[14] Ikonen, P. (2017). *Financial depth, debt, and growth*. Helsinki: Grano Oy

[15] Jörg, M. D. (2010). Nigerian pension reform 2004-2010: Great leap or inappropriate policy design? *The Korean Journal of Policy Studies,* 25(2), 13-37.

[16] Kigen, A. K. (2016). Effect of fund size on the financial performance of pension funds in Kenya (Masters Thesis). Retrieved January 30, 2018 from scholar.google.com

[17] Kiyotaki, N. & Moore, J. (2005). Financial Deepening. *Journal of the European Economic Association,* 3(2&3), 701-713.

[18] Musa, A. (2020). Determinant of pension reform act of 2014 in Nigeria: A study of Abuja workers, *Nile Journal of Business and Economics*. Retrieved from http://journal.nileuniversity.edu.ng/index.php/NileJBE/

[19] Ndebbio, E. U. (2000). The impact of financial deepening on growth: A study of selected Sub-Saharan African (SSA) countries, *NDIC Quarterly,* 10(2), 36-64.

[20] Odo, C. O., Ani, W. U. & Agbo, I. U. (2021). Contributory pension scheme and the premium base of the Nigerian insurance industry, *Journal of Financial Risk Management, 101-116, available at DOI: 10.4236/jfrm.2021.102006*

[21] OECD (2005). Ageing and pension system reform: Implications for financial markets and economic policies, *OECD Publishing*, 28.

[22] Okoro, E. G & Okoye, E. I. (2019). Pension investment funds analysis: a variance-comparison tests of non-contributory (pre) and contributory (post) schemes in Nigeria accessed at 10.36108/unizikjb/9102.20.0260

[23] Ozor, E. (2006). Review of factors that slow down the processing of retirement benefits, A paper presented at the workshop organized by the institute of chartered secretaries and administration of Nigeria, Held at Modotel Enugu, between 14th and 16th

[24] Pension Commission (2019). Regulation on investment of pension fund assets. Retrieved from: https://www.pencom.gov.ng/wp-content/uploads/2019/01/AMENDED-INVESTMENT-REGULATION-FEBRUARY-2019-.pdf

[25] Rousseau, P. L. & Wachtel, P. (2005) Economic growth and financial depth: Is the relationship extinct already? *WIDER Discussion Paper No.* 2005/10.

[26] Rousseau, P. L. & Wachtel, P. (2008). What is happening to the impact of financial deepening on economic growth? Retrieved from: www.papers.ssrn.com/so13/papers.cfm?abstract_id=1281959

[27] Wallick, D. W., Julieann, S., Christos, T. & Joanne, Y. (2012). *The global case for strategic asset allocation*. Valley Forge, Pa.: The Vanguard Group.

[28] Wang, Y., Li, X., Abdou, H. A. & Ntim, C. G. (2015). Financial development and economic growth in China. Investment Management and Financial Innovations, 12(3), 8-18.