

IMPACT OF PENSION FUND ON STOCK EXCHANGE DEVELOPMENT: EVIDENCE FROM NIGERIAN CONTRIBUTORY PENSION SCHEME

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Abstract

This research paper explores the intricate relationship between pension funds and stock exchange development, with a specific focus on the Nigerian Contributory Pension Scheme (CPS). In the context of Nigeria's evolving financial landscape, the study investigates how pension funds, as a substantial source of institutional investment, impact the growth and stability of the Nigerian stock exchange. The study employs the Autoregressive Integrated Moving Average (ARIMA) regression modeling technique for quarterly data for the period of 2005 to 2022. Data gathered from a variety of sources, including pension fund administrators, stock exchange data, and the World Bank, provides the foundation for a thorough investigation. The research encompasses a historical overview of Nigeria's pension system, an examination of the investment patterns of pension funds, and an evaluation of their impact on stock market dynamics.

Findings from the study reveal significant insights into the symbiotic relationship between pension funds and stock exchange development. Pension funds, as a vital source of long-term capital, exert a stabilizing influence on the stock market, fostering liquidity and reducing volatility. The research also identifies challenges and opportunities within the Nigerian (CPS) framework, highlighting areas for improvement in governance, regulation, and investment diversification. In conclusion, this research underscores the crucial role of pension funds in the development of the Nigerian stock exchange and, by extension, the broader financial sector. It identified that pension fund assets play a significant role in improving overall participation in the stock market.

Keywords: Pension fund, Nigeria exchange group, contributory pension scheme, ARIMA

1. Introduction

Stock exchange being an organized market for the trading of securities such as shares, stocks, and bonds (Masoud 2013). In most countries, the stock exchange has two important functions. It acts as a ready market for securities to ensure liquidity and encourage people to direct their savings into corporate investment (Samiksha, 2022). The stock exchange functions as a pricing mechanism, allocating capital among firms by determining prices that reflect the true investment value of a company's stock (Dow & Gorton, 2016). The pension industry has undergone a series of reforms during the last two decades. These reforms are largely necessary as a catalyst for economic growth and development due to the crisis the pension industry is currently experiencing (Zubair, 2016). The main objective of pensions is to ensure income security in old age in the least cost-effective manner possible and to also target some macroeconomic benefits

Travkina et al. (2022) pointed out that a distinguishing feature of funded pension plans is the steady accumulation of long-term financial resources. Thus, the long-term accumulation of pension reforms increases investment in the stock market. Notably, a particular aspect of the reform will determine how much of an impact it has on the growth of the financial market. Contributory pension scheme has empowered employees to manage their retirement savings account, and granting them control over their retirement savings. This has led to the accumulation of retirement savings account by millions of workers, creating substantial long-term funds for potential investment in the economy (Dibal et al., 2023). The new pension scheme in Nigeria is fully funded with contributions deducted monthly from the employee's salary, while the employer will provide the counter-part contribution for the employee, which will both be transferred to the relevant retirement savings account. Thus, the pension serves other purposes, in addition to enabling pension assets to be kept aside from the onset to meet future pension liabilities, and every employee is required by law to open a Retirement Savings Account (RSA) in his name with a Pension Fund Administrator (PFA) of his choice. The act also required and specified that the pension fund assets collected are to be invested in securities and stocks, from which the returns accrue to the retirees (Pension Reform Acts).

Given that Pension funds are required to invest between 5% and 70% of their total assets in accumulated funds in accordance with the Investment Guidelines of the contributory pension scheme (CPS), the effect of such investment cannot be underestimated. This is to examine the effect of CPS on the Nigeria Exchange Group with respect to all share index, market capitalization and volume of trade. Consequently, this study employs quarterly data for the period ranging from 2005 to 2022 to examine the relationships between the pension funds and the market capitalization.

The link between pension fund investment and stock exchange development is a topical issue among scholars and policymakers. The issue of pensions has received much attention in many countries over the past decades. As a strong and dynamic stock market is seen as a catalyst for mobilizing savings, efficiently allocating resources, and thereby facilitating long-term investments in productive economic sectors (Sogunle, 2021) An important justification for pension systems that are fully funded is that doing so requires the pooling of long-term financial savings, which in turn reduces the cost of funds for firms that support the growth of financial markets. This study examines the influence of pension funds on stock exchange development in Nigeria from 2005 to 2022, using all share index, market capitalization, and volume of trade. Main objective of this study is to determine the relationship between contributory pension funds and stock exchange development in Nigeria. The objective seeks to determine the long run relationship between pension funds and all share index, determine the long run relationship between pension funds and market capitalization, and determine the long run relationship between pension funds and volume of trade. This study is essential because it will examine the influence of pension funds on the development of stock exchanges in Nigeria. The pension fund will be considered the independent variable, while stock exchange development will be the dependent variable. The indicators of stock exchange development in Nigeria include market capitalization, number of shares traded, all-share index, etc. This study will cover a period of 17 years (2005–2022), which was considered relevant because of the availability and accessibility of data.

2. Literature Review

Pension Funds

A pension fund is an accumulation of contributions received from members, usually employees for the purpose of providing their retirement benefit liabilities (Pulatovich, 2023). According to Teall (2018), pension funds are established to facilitate the collection and investment of contributions made by employees. Over the years, pension fund administration has changed from defined benefit scheme to defined contribution schemes globally. (Baltas et al 2022) defined contributory pension schemes to have rules that mandate the employer and the employee to remit a specified percent to the fund. Pension fund accumulates assets that are invested in financial markets, to enhance the depth and

liquidity of the capital markets (Sanusi et al 2022). Also, a pension is a one-time payment made to an employee when he leaves active duty. This implies that pension plans might be single or multiemployer, insured or trusted, group or individual, with fixed or variable benefits, and contributory or non-contributory (Pillah, 2023).

Pension funds are of different types: defined benefit (DB) funds, Defined Contribution (DC) funds, and Hybrid funds (Broadbent et al., 2020). The DB funds promise a specific benefit amount to retirees based on a predetermined formula, linked to salary and years of service. The responsibility for funding the promised benefits lies with the employer or plan sponsor (Munir, 2022). The DC funds accumulate contributions made by both employees and employers into individual accounts. The contributions, investment performance, and individual decisions made at the time of retirement all affect the final retirement income (Clark & Monk, 2019). The hybrid funds combine the elements of both DB and DC plans, it offers a guaranteed benefit component along with an investment-based component, sharing the risk between employers and employees (Wolf, 2022).

The functions of pension funds includes accumulation of funds over an individual's working years and providing a stable income stream during retirement, as well as ensuring financial security for retirees (Shi, 2023). Pension funds also invest contributions in a diversified portfolio of assets to generate returns over the long term, aims to grow the fund's value and meet future pension obligations (Bodie et al., 2019). Pension funds manage investment risks through diversification, asset allocation strategies, and risk management techniques to balance risk and return objectives (Farnsworth & English, 2019). Pension funds perform the function of engaging in asset liability management, aligning the duration and risk profile of their assets with their pension liabilities to ensure the ability to meet future benefit payments (Munir, 2022). And lastly, pension funds often exercise shareholder voting rights and engage in active ownership practices, to promote good corporate governance and responsible investment practices (Zubair, 2016).

Nigeria Contributory Pension Scheme

The Nigeria Contributory Pension Scheme (CPS) was established in 2004 with the passage of the Pension Reform Act (PRA) to address the challenges associated with the previous defined benefit scheme (Eme et al., 2014). The Contributory Pension Scheme (CPS) is an arrangement where both the employer and the employee contribute a portion of an employee's monthly emolument towards the payment of the employee's pension at retirement (National Pension Commission, 2004). The CPS was established with the following objectives: to ensure that every worker receives retirement benefits as at when due while also assisting individuals in saving for retirement (Moeis et al., 2022).

The CPS mandates both public and private sector employees to participate, with the exception of the Armed Forces and intelligence agencies. The Pension Reform Acts established Pension Fund Administrators (PFAs) as licenced entities responsible for

managing the pension funds and ensuring the payment of retirement benefits. Pension Fund Custodians (PFCs) were introduced to keep custody of and safeguard the pension fund assets on behalf of the PFAs. Each contributor to a pension fund has a Retirement Savings Account (RSA). The National Pension Commission (PenCom) serves as the regulatory body responsible for the supervision and regulation of the CPS (Eme et al., 2014).

Stock Exchange

A stock exchange is a regulated marketplace where buyers and sellers come together to trade securities, such as stocks, bonds, and derivatives (Rocky 2023). According to Petry (2021), the stock exchange is one of the important constituents of the capital market, it is an organised market for the purchase and sale of industrial and financial securities. It is a convenient place where trading in securities is conducted in a systematic manner, i.e., as per certain rules and regulations. The stock market is an organized market for buying and selling corporate and other securities (Masoud, 2013). Here, securities are purchased and sold as per certain well-defined rules and regulations. It provides a convenient and secured mechanism or platform for transactions in different securities. Such securities include shares and debentures issued by companies that are duly listed at the stock exchange and bonds and debentures issued by the government, public corporations, and municipal and port trust bodies. (Bureau of Labour Statistics, 2021).

Pension Funds and the Stock Exchange

Pension funds are expected to contribute to a nation's economic growth by increasing savings at both the household and the national level, providing larger amounts of long-term capital, enhancing corporate performance, and reducing volatility in capital markets. Walker and Lefort (2002) documented a positive relationship between pension reforms that reinforce pension funds and capital market growth. In the same vein, Davis (2004) reported a high correlation between stock market capitalization and the size of the pension fund market, while Meng and Pfau (2010) reported that pension assets improve market capitalization and liquidity in countries with high levels of financial development.

Theoretical Review

Rational Expectations Theory

Rational expectations theory is an economic theory that states that individuals make decisions based on the best available information in the market and learn from past trends. (Moroz & Peresada, 2022). Rational expectations suggest that people will be wrong sometimes but that, on average, they will be correct. Although this theory has become quite important to economists, its utility is underrated. For instance, an investor thinks the price of a stock will rise in the future, and by buying it, the price actually rises. This same scenario can be framed outside of rational expectations theory, where an investor notices a stock is undervalued, buys it, and watches as other investors notice the same thing, thus

pushing the price back to its normal market price or value. Therefore, if there is a perception that investing in NGX' securities or related assets is likely to yield attractive returns, rational investors within the pension scheme will allocate funds accordingly.

Capital Market theory

Capital Market Theory was developed by Bodie et al in 2005 the theory examines the efficient allocation of capital within financial markets, focusing on the interaction between investors, securities, and the pricing mechanism. It emphasizes the importance of risk and return in investment decision-making and explores the way capital flows between investors and issuers of securities. Capital Market Theory encompasses concepts such as the Capital Asset Pricing Model (CAPM), which provides a framework for calculating the expected return on an asset based on its risk relative to the market as a whole. Pension scheme funds like any other institutional investor will use the CAPM to estimate the expected return on NGX securities or assets (Oyedeko et al., 2023). It is a finance model that establishes a linear relationship between the required return on an investment and risk. (Cautero, 2023). Capital Market Theory is more comprehensive for studying the complex interactions between pension funds and capital markets, making it suitable for the investigation into the relationship and impact on development.

Financial Intermediation Theory

This theory looks into the role of financial intermediaries, such as banks, pension funds, and insurance companies, in ensuring flow of funds between savers and borrowers. The theory suggests that financial intermediaries play a crucial role in overcoming information asymmetry, transaction costs, and other market irregularities that inhibit direct lending and borrowing between savers and borrowers (Yashim et al., 2024). The theory relates to the study in that it provides insights into the intermediary role played by pension funds in capital markets, as pension fund gathers fun from contributors and allocate them to various financial institutions. Thus theory is most suitable as it describes how pension funds as an intermediary contribute to capital market development in Nigeria by channeling funds into productive investments.

Empirical Review

Bayar and Kilic (2019) found that pension funds affected stock market development in the long run, while Daradkah et al. (2020) found no statistically significant relationship between pension funds and capital market development in the short run. Sanusi et al. (2021) indicates that pension funds have no statistically significant effect on the overall investment levels and growth of the South African Economy.

Bakare (2022) used data from 2005 Q1 to 2019 Q4 and study the influence of Contributory Pension Funds on the performance of the Capital Market in Nigeria. The study used time series secondary data from National Pension Commission and NSG, the study aimed to assess the impact of pension fund investments in government securities,

corporate securities, and real estate on capital market performance employing the ex post facto research approach. The results indicated that investment in government and corporate securities significantly and positively affected capital market performance both in the short and long term, whereas investments in real estate property showed no significant impact. The study concludes that pension fund investments have played a constructive role in expanding the Nigerian stock market, and recommended a strategic allocation of assets by pension fund administrators

Yaki and Yashim (2022) study of the relationship between pension fund investment and capital market development in Nigeria, using the Autoregressive Distributed Lag Model (ARDL) as their analytical framework. Their study uncovered several significant insights: over the long term, local ordinary shares (LOC) exerted a notably positive influence on total market capitalization, while the effects of pension fund investment asset (PFI) and monetary policy rate (MPR) were positive but with no statistical significance. The study indicates that pension fund investment has played a pivotal role in fostering the development of the Nigerian capital market and advocated for heightened pension fund investment within the capital market to increase its development

Dibal et al (2023) study of pension fund investments and the development of the capital market in Nigeria and showing its relationship with inflation from 2013-2020, it used the Autoregressive Distributed Lag (ARDL) model and their findings aims to show whether inflation enhances or reduces the effect of pension fund investment on capital market development. The study revealed that pension fund investment have a long and short run effect on capital market and inflation tend to reduce the negative impact of total domestic debt securities on total market capitalization.

3. Methodology

This research adopts an ex-post facto longitudinal research design. It is considered the most appropriate research design for this study because all the necessary data to achieve this study's objective were made available historically in the published financial reports of PENCOM and the CBN's statistical bulletin, which sought to determine the relationship between pension funds and stock exchange development. A longitudinal research design is possible when time series and cross-sectional data are used (Gujurati and Porter, 2009). Ex-post facto is also known as "after-the-fact" research, as it looks into how an independent variable (groups with certain qualities that already exist prior to a study) affects a dependent variable. The study will use secondary data from PENCOM quarterly economic reports, the CBN Statistical Bulletin, and the World Bank's WDI. The data will be collected directly from the sources in a time series for the period of 17 years (2005–2022). The model used in this research work is specified following the study as in line with Olutimi et al., (2024) $LMCAP = L\beta_{10} + \beta_{11}LPFA + \beta_{12}LAgeD + \beta_{13}LPFA + \beta_{14}LINF + \beta_{14}LRIT + \varepsilon_1$ ---(1.1) Where: LMCAP = Log of Market Capitalization

LPFA = Log of Public Sector Pension Contribution Fund LAgeD = Log of Age Dependency LPFA = Log of Pension Fund Investment Asset LINF = Log of Inflation Rate LRIT= interest rate

4. Results and Discussion

The table show the result of the descriptive Statistics

Table 1: Descriptive Statistics

Variable	Mean	Maximum	Minimum	Std. Dev.
ASI	33473.4	62047.4	16495.0	9094.315
MCap	11,494.35bn	26,914.61bn	1,332.31bn	6546.60
PFA	5.50	4.23	14.9	4.64
VOT	1459107	3535493	673449	689855.5
AgeD	5.970	14.96	4.016	1.31211
GDP	\$2390.96	\$ 2679.55	\$1898.94	216.17
INF	13.44	46.018	5.38	5.74
RIT	5.3	18.18	-7.19	4.894

Source: E-views 19, Author’s Computation, (2023)

The summary statistic results presented in Table 4.1 are shown as the average value of variables over the period (mean), spread from this average behavior (standard deviation), the lowest recorded during the period (minimum), and the highest recorded during the period (maximum).

As for Market capitalization, the result in Table 4.1 shows that it has a mean value of ₦11.4 trillion over the period, a standard deviation of ₦6.5 trillion, a minimum of ₦1.3 trillion, and a maximum of ₦26.9 trillion. These indicate that the average market capitalization of the Nigerian stock exchange between 2005 and 2022 was ₦11.4 trillion, with a spread of ₦6.5 trillion from this average behavior. The lowest market capitalization the exchange recorded during the period was ₦1.3 trillion, while the highest recorded market capitalization during this period was ₦26.9 trillion.

The pension fund asset also has a mean value of ₦5.5 trillion over the period, a standard deviation of ₦4.6 trillion, a minimum of ₦4.25 trillion, and a maximum of 14.9 trillion. These indicate that the average pension fund asset of the Nigerian population during the period under investigation (2005–2022) was ₦5.5 trillion, with a spread of 4.6 trillion. The lowest pension fund asset recorded during the period of 2005–2022 was ₦4.25 trillion, while the highest recorded during this period was ₦14.9 trillion for the Nigerian population. Similarly, during the period under investigation, the All-Share index averaged 33,473 points, with a spread of 9,094 points and minimum and maximum values of 62,047.4 and 16,495 points, respectively.

Correlation Analysis

This section presents the correlation coefficients of the relationship between the Nigerian market capitalization, pension fund assets, and each of the other variables considered in this study.

Table 2: Correlation Matrix of Variables

Prob.	ASI	MCAP	PFA	VOT	RIT	AgeD	GDPP	INF
ASI	1.0							
MCAP	0.5330	1.0						
PFA	0.3857	0.8964	1.0					
VOT	0.2783	-0.2808	-0.489	1.0				
RIT	-0.1653	-0.1032	-0.05027	0.2275	1.0			
AgeD	0.4479	-0.216	-0.0926	0.3025	-0.2455	1.0		
GDPP	-0.08156	0.4601	0.6117	-0.3335	0.5257	-0.3320	1.0	
INF	0.37145	0.1952	0.3008	-0.0963	-0.5409	0.7169	-0.2530	1.0

Source: E-views 19, Author’s Computation, (2023)

The results of correlation analysis in Table 4.2 show that Nigeria’s stock exchange market capitalization has positive correlation coefficients with pension fund assets, the All-share index (that tracks the overall performance of the exchange), GDP per capita, and the inflation rate. On the other hand, the market capitalization of the Nigerian exchange has a negative correlation coefficient with the age-dependency ratio, the real interest rate, and the volume of transactions on the exchange. This implies that the market capitalization of the Nigerian stock exchange moves in the same direction as pension fund assets, the All-share index, GDP per capita, the inflation rate, population growth, and government expenditure but moves in the opposite direction with the age-dependency ratio, the real interest rate, and the volume of transactions.

The dependent variable is market capitalization in natural logarithm transformation, while the independent variables are Pension Fund Assets, the all-share index, and the volume of transactions on the exchange. Variables such as the age dependence ratio, the inflation rate, and the real interest rate were included in the model as control variables. The ARDL short and long-run methods were used to estimate the parameters of the model. Table 3: ARDL Short- and Long-Run Regression Results.

Dependent Variable: Lnmarkcap

Cointegrating Form

Variable	Coefficient	Std. Error	T-Statistic	Prob.
D(All_Share_Index)	0.000009	0.000002	4.133292	0.0001
D(Pension_Fund_Assets_To_G)	0.067159	0.017154	3.915025	0.0002

D(Real_Interest_Rate___)	0.004933	0.003431	1.437946	0.1550
D(Age_Dependency_Ratio__Ol)	-0.009236	0.019687	-0.469134	0.6405
D(Inflation__Consumer_Pric)	0.001008	0.004990	0.202041	0.8405
Cointeq(-1)	-0.303177	0.055043	-5.508031	0.0000

Long-run coefficients

Variable	Coefficient	Std. Error	T-Statistic	Prob.
All_Share_Index	0.000029	0.000006	4.660157	0.0000
Pension_Fund_Assets_To_G	0.221518	0.031462	7.040890	0.0000
Real_Interest_Rate___	0.016272	0.011076	1.469067	0.1464
Age_Dependency_Ratio__Ol	-0.030464	0.064430	-0.472827	0.6379
Inflation__Consumer_Pric	0.003325	0.016643	0.199796	0.8422
C	7.189828	0.293140	24.526982	0.0000
R-squared	0.971733	Mean Dep. Var.	9.197147	
Adjusted R-squared	0.969239	S.D.dependent var	0.611786	
S.E. of regression	0.107300	Akaike info criterio	-1.537684	
Sum squared resid	0.782908	Schwarz criterion	-1.321385	
Log likelihood	64.66316	Hannan-Quinn crite	-1.451318	
F-statistic	389.6057	Durbin-Watson stat	1.291622	
Prob(F-statistic)	0.000000			

Source: Eviews 19, Author's Computation, 2023

Table 3 presents the result of OLS regression to examine the contributory impact of pension fund schemes on the development of the Nigerian Exchange Group (NGX). The reported R-squared of the model is 97%, and the adjusted R-squared of 96.9% shows that the model explains about 97% of variations in the development of the stock market in Nigeria. The reported F-statistic shows a value of 389.6, with a p-value of 0.0000, which indicates that it is statistically significant. This indicates that the overall model is statistically significant and has a good fit.

The negative coefficient of the first period lag of the error correction term [i.e., ECT (-1)] and the fact that its p-value (p-value = 0.000) is less than 0.05 suggest that, after a short-run disequilibrium, the model returns to long-run equilibrium. Its coefficient of -0.3031 indicates that about 30.3 percent of the short-term errors are corrected in each period, and the economy will achieve full convergence (i.e., 100 percent) in about three periods.

Evaluating the independent variables of the model, in the short run, the all-share index, inflation rate, pension fund assets, and real interest rate have positive coefficients in the result. On the other hand, the age-dependency ratio has a negative coefficient in the result, which is -0.0092.

Looking at the significance of these coefficients through the p-value, The All-share index and Pension funds' assets have p-values of 0.0001 and 0.0002, respectively, which are lower than 0.05 (i.e., 5% significance level). On the other hand, the age-dependency ratio,

inflation, and real interest rate have p-values of 0.64, 0.84, and 0.15, which are greater than 0.05.

5. Conclusion and Recommendation

Conclusion

The research concludes that the level of pension fund schemes is critical for strong development of stock market growth. Also the rising inflation rate as witnessed in the country is inducing a negative return and therefore the government expenditures must be driven in such a way to attract capital inflow and providing social infrastructure to attract foreign direct investments. Overall, pension fund assets play a significant role both in the short-term and long-term, in improving overall participation in the stock market. However, pension fund investments need to be diversified beyond traditional fixed-income securities

Recommendations

After analyzing the impact of pension fund assets on development of the stock market in Nigeria and from the facts generated it could be said that Nigeria stock market is still far behind as compared to its African peers. Factors such as inflation, unemployment, and poverty rate are contributory. Similarly, pension fund assets have been plagued with strict regulations and a lack of investment opportunities due to low participation in the stock market. For this reason, based on the findings of the study, the following recommendations are suggested:

- i. Encourage pension funds to diversify their investments beyond traditional fixed-income securities and this can be achieved through regulations that set appropriate limits and guidelines for pension funds' allocation to stocks.
- ii. Educate pension fund managers, trustees, and investors about prioritizing investment strategies that not only generate favorable returns but also mitigate risks and contribute to the overall health and resilience of the capital market.
- iii. The Policymakers and regulators should continue to support and strengthen government-backed pension schemes in Nigeria and this can be done through implementing measures to enhance the efficiency and effectiveness of pension contributions, such as improving governance structures, ensuring timely and adequate funding, and promoting transparency in investment decisions.

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