

# How Does Pension Funds Impact Stock Market Development? An Empirical Analysis from Nigeria Using ARDL Technique

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## Abstract

The study examined the impact of pension funds on capital market development in Nigeria from 1995-2022 using ex-post facto research design. Data were collected from the Central Bank of Nigeria statistical bulletin and annual report of the pension fund commission. Data were analyzed using descriptive statistics, unit root test and auto regressive lag model (ARDL). The findings show that there is a long run relationship between market capitalization as a ratio of gross domestic product and selected pension fund variables in Nigeria. Also, there is a no long run relationship between all share index as a ratio of gross domestic product and selected pension fund variables in Nigeria. This implies that there is a short run relationship between all share index as a ratio of gross domestic product and selected pension fund variables in Nigeria. Also, pension fund has positive and statistically insignificant implying that the present value of pension contributory fund does not impact positively on its immediate past state. Inflation has positive and significant impact on market capitalization as a ratio of gross domestic product in Nigeria. Also, inflation has negative and insignificant impact on all share index as a ratio of gross domestic product in Nigeria. Pension investment at precious value is positive and as a statistically significant impact on all share index as a ratio of gross domestic product in Nigeria implying that pension fund investment could be used as purchase of share to increase the total share index in the Nigeria for future benefit for the pensioner whose contribution yields greater impact or return for stable future. The study recommended that pension fund administrators in Nigeria should understand that the rate of inflation is dynamic in Nigeria and the value of money is being lost as money is not worth

its values in the next five years.

## Keywords

Pension Fund, Capital Market Development, ARDL, Nigeria

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## 1. Introduction

In the literature, pension funds have been recognized to play a contributory role in the development of capital markets (Rezk, Irace, & Ricca, 2009). The importance of institutional investors and pension funds is heightened in the context of developing financial markets in a market-based economy, with studies showing a country's ability to make large gains from pension funds is dependent on financial market structure. However, some notable authors in this field of study have expressed optimism that the pension scheme has the potentials of mobilizing savings for economic growth. The pension scheme is expected to mobilize savings for capital market development and economic growth.

The literatures such as Garcia & Liu, 1999; Rezk, Irace, & Ricca, 2009 have established discrepancies on the challenges posted by pension contributory fund, pension fund investments on capital market development proxied market capitalization as a ratio of gross domestic product. Several works have been done on the subject with mixed results. Studies reveal that the argument in the literature on the impact of pension fund on the development of the capital market has not been adequately resolved. The inconclusive nature of these theoretical and empirical studies provides the basis for a further empirical investigation on the role of pension fund on capital market in economic growth. Hence, this study was needed.

The scope of this study is limited to the impact of pension funds on capital development in Nigeria covering a period of 28 years from 1995-2022. This period is being chosen so as to cover the past and current issues on Pension Fund Reform Act of 2004 and Pension Amendment Act of 2014 in Nigeria. Moreover, the period was chosen because it was the period when most of the reforms of Pension Fund Administration in Nigeria took serious effect. This study provides a fulcrum for policy makers in the pension and financial markets to seek new ways to solve this conundrum. Also, the government and players in the capital market will benefit from this study. The study is also expected to add knowledge into the growing body of work in capital markets and pension funds. Finally, other researchers and investment institutions will expound on the effects of pension funds' investments on the financial performance of the Nigerian Exchange Group (NGX) and will also find this study resourceful. First, the study expects that a healthy pension fund market tends to suppress the risky behavior of participants in the capital market, and thereby helps reinforce a desirable relationship between pension funds and the capital market. The rest of the paper is

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organized as follows: Section 2 provides a literature review, Section 3 describes the methodology employed in this study, Section 4 discusses the results of the study, and Section 5 concludes the study by providing relevant recommendations.

## 2. Literature Review

### 2.1. Concept of Pension Funds

Pension funds are pools of savings accumulated during the working life of individuals. At any given point in time, they are the sum of the flow of the employer and employee contributions, investment income, and eventual benefits paid. Their definition varies from country to country depending on the specific pension plan or scheme arrangement (Impavido, 2013).

### 2.2. Concept of Capital Market Development

According to Al-Faki (2007), the capital market is a network of specialized financial institutions, series of mechanisms, processes and infrastructure that, in various ways, facilitate the bringing together of suppliers and users of medium to long term capital for investment in socio-economic developmental projects. The capital market is divided into the primary and the secondary market. Chisholm (2009) describes capital markets as places where those who require additional funds seek out others who wish to invest their excess. They provide platforms where the market players, the sellers and buyers of securities, 'can manage and spread their risks. Capital markets are made up of two segments: securities and non-securities segment. Securities are more liquid than non-securities as they can be bought and sold more easily without large swings in the price. Individuals and institutional investors therefore tend to prefer securities (McLindon, 2006). Generally, one of the core functions of capital market is to facilitate the channeling of funds from savers to long-term investors who invest in physical capital which is necessary to increase production capacity and promote economic growth. Capital markets trade in instruments that are over a year or more and include long-term debt obligations such as government bonds and equities. These instruments usually involve longer maturities and higher degrees of risk (Bailey, 2005).

### 2.3. Market Capitalization

Market capitalization is the share price times the number of shares outstanding. Listed domestic companies are the domestically incorporated companies listed on the country's stock exchanges at the end of the year (Akpeghughu & Igoni, 2021). Market capitalization is a measure of the value of a company, calculated by multiplying the number of either the outstanding shares or the floating shares by the current price per share (Milos, 2012). Outstanding shares include all the stock held by shareholders, while floating shares are those outstanding shares that actually are available to trade. Market capitalization, or cap, is one of the

criteria investors use to choose a varied portfolio of stocks, which are often categorized as small-, mid-, and large-cap (Ogege & Ezike, 2012). Generally, large-cap stocks are considered the least volatile, and small caps the most volatile. The term market capitalization is sometimes used interchangeably with market value, in explaining how a particular index is weighted or where a company stands in relation to other companies (Eke & Onafalajo, 2015).

## **2.4. Theoretical Review**

The theories examined and informed the researcher is theory of financial intermediation, investment theory, and efficient market hypothesis.

### **2.4.1. Theory of Financial Intermediation**

Scholten's (2003) theory of financial intermediation tends to concentrate on receiving deposits and issuing loans as financial intermediaries, a subset of capital and money markets operations (Robu & Sandu, 2011). A wider canvas is required to understand the changing role of pension funds as financial intermediaries and their impact on financial markets. Financial intermediation theory, which focuses primarily on banks, considers actions such as deposit taking and loan issuance as defining the function of financial intermediary (Robu & Sandu, 2011), while expanding the concept of economic intermediation to the operations of pension funds. Consequently, pension funds play a financial intermediary function by investing cash accumulations in a multitude of financial resources (e.g. corporate equity, government bonds, actual estate, corporate debt, overseas tools, and deposits) (Robu & Sandu, 2011). An appropriate framework for evaluating the function of pension funds as intermediaries is through account of the financial system's general tasks. This offers a foundation for assessing the extent to which pension funds act as agents of economic change by more effectively fulfilling the tasks of economic structures than options (such as banks and individual investors).

### **2.4.2. Investment Theory**

Raymond postulates that investment involves making what is called a sacrifice that is made in the present with the expectation of getting benefits in the future. There are two crucial issues in the investment, which are the present or current sacrifice and expected benefit or future benefit. Investment is regarded as the commitment and sacrifice of certain present value for the future world which is uncertain. It involves the issue of making decision of investing fund in any financial or physical form with the expectation of getting additional return in the future. This is what is called economic investment. In selecting the portfolio to be invested, the investment manager employs mechanisms which are used to measure the value of the project concerned at the economic perspective. The logic of doing that is to increase the wealth of the investor at large.

### **2.4.3. Efficient Market Hypothesis**

The term Efficient in the context of security market refers to how information is

processed by investors. A stock market will be efficient where necessary and essential information are quickly and accurately gotten to the investors and where this information truly reflects in the share price. This means that there will be no prospect of speculative bubbles as share price will truly reflect the information available always. The Efficient-Market Hypothesis (EMH) basically states that all available information about investments securities such as stocks is reflected in the prices of those securities. Therefore, if this assumption is true, an investor cannot make more gains than other investors in the market. Using the Efficient-Market Hypothesis (EMH), the investors do not need to be rational because investors act randomly, but market is always right. Proponents of Efficient Market Hypothesis posit that investors benefits from investing in a low cost, passive portfolio. Opponents of Efficient Market Hypothesis believe that it is possible to beat the market and that stocks can deviate from their fair market values. The Efficient-Market Hypothesis (EMH) does not ascertain that an investor could outperform the market, but there are some investors that can be lucky enough to beat the market averages while some other investor would be unlucky by losing to the market, but the majority is at median.

The hypothesis asserts that financial markets are “informationally efficient”. There are three major forms of the hypothesis: “weak”, “semi-strong”, and “strong”. Weak Efficient Market Hypothesis claims that prices on traded assets (for example, stocks, bonds, or property) already reflect all past publicly available information. Semi-strong EMH states that prices reflect all publicly available information and that prices instantly change to reflect new public information. Strong EMH additionally claims that prices instantly reflect even hidden or “insider” information. Efficient market theory implies that market will react quickly to new information. Thus, it is important to know when the accounting report first became publicly known.

## 2.5. Theoretical Framework

Even though any of the theories reviewed above could be used, Efficient Market Hypothesis is found to be most appealing theory to underpin this study. According to Efficient Market Hypothesis (EMH), financial markets are efficient when prices on traded assets have already reflected all known information and therefore are unbiased due to the fact that they represent the collective beliefs of all investors about future prospects. Previous test of the EMH has relied on long-range dependence of equity returns. It shows that past information has been found to be very useful in improving predictive accuracy. This assertion tends to invalidate the EMH in most developing countries. Equity prices would tend to exhibit long memory or long range dependence, because of the narrowness of their market arising from immature regulatory and institutional arrangement. They noted that where the market is highly and unreasonably speculative, investors will be discouraged from parting with their funds for fear of incurring financial losses. The situation like the one mentioned above has detri-

mental effect on economic growth of any country, meaning that investors will refuse to invest in financial assets. The implication is that companies cannot raise additional capital for expansion. Although, this theory has been criticized by different authors, despite the criticism, it suffices to say that efficiency of the capital market is a necessary condition for growth and development in Nigeria (Nyong, 2003).

## 2.6. Empirical Review

Hereunder, past studies and researches that have been done in the area of the impact of pension funds on capital market development shall be exhaustively highlighted. This is aim at unravelling up-to-date information about the subject matter. There is no agreement whatsoever on the specific mechanisms underlying these relationships or on their direction of causality. Hence, the literature remains with mix reactions and inconsistencies on determining the true relationship among the various variables.

The findings of Kibet and Simiyu (2016) using content analysis revealed that pension fund played a major role in economic growth and economic development in Singapore but unfortunately performed below expectation in Kenya and thus, recommended that Kenya needed to expand the scope of pension fund contribution to cover every sector for it to have meaningful impact and achieve her vision 2030. This study failed to establish the link between pension funds and economic growth and development in Kenya. On his part, Kigen (2016) conducted a study on the effect of fund size on the financial performance of pension funds in Kenya. His research covered a period of 5 years from 2011 to 2015. The sub-variables used to represent the independent variable fund size were six in number namely; contribution density, accumulated fund assets, number of members, administration costs and investment costs. From the results, it was found that administrative expenses, investment expenses, pension contribution and accumulated fund assets all had significant effect on the financial performance of pension funds in Kenya.

Likewise, Yinusa, Somoye, Alimi and Ilo (2016) in their research paper, highlighted the problem of simultaneity between funding structure and firm results while studying the United States banking sector. They claim that external equity agency costs are measured by the loss of firm value induced by managers' self-interest in optimizing their own utility functions at the shareholders' interest expense. They also state that the funding structure impacts the expenses of the organization and thus impacts the output of the company. Muritala (2018) on his part evaluated the impact on firm results of the leverage ratio of Jordanian companies. Using return on investments and Tobin's Q as a performance measure, it was discovered that the structure of funding is negatively linked to firm performance.

Micah and Obah (2016) investigated the relationship between pension fund administration and infrastructure financing in Nigeria. The study answered four research questions and also tested four hypotheses. Correlation was used as ana-

lytical technique for the study. The population of the study consists of all the licensed pension fund administrators in Nigeria. A simple random sampling was used to select 108 respondents for the study. The secondary data and questionnaire was used to elicit information from the respondents after the reliability and validity test. The research questions were analyzed using descriptive statistics, while the hypotheses were tested using Pearson Products moment correlation via SPSS at 95% level of confidence. The findings from the study show that there is Relationship between Retirement Pension Account and Return on Economic and Social Infrastructural Financing; also the study found that there is a significant Relationship between Superannuation Pension Account and Economic and social Infrastructural Financing in Nigeria. With the pool of pension funds, investment in infrastructure projects will be very meaningful and relevant to the growth of Nigeria's economy.

A study conducted by Zubair (2016) examined the impact of pension fund investments on the performance of capital market in Nigeria. The study was a time series analysis covering a period from 2009 to 2016 using the Autoregressive Integrated Moving Average (ARIMA) regression technique. The study results confirmed the existence of a positive relationship between pension funds' investments and the performance of capital market in Nigeria. Specifically, the study concludes that total pension investments in Nigeria improved the performance of the Nigerian capital market significantly in terms of depth and liquidity (market capitalization and value traded). Capital market performance variables were measured by market capitalization and total value traded; while pension funds investment was measured using the total pension fund assets at the end of every quarter. Bayar (2017) also examined the effect of individual pension funds on the development of capital market in Turkey. The used a sample of period of ten years. To analyse the data they used co-integration test. The study found that, in the long run pension funds should have a positive impact on the capital market. Capital market performance variables were measured by market capitalization and total value traded, while Pension funds' investment was measured using the total pension fund assets.

There has been considerable interest in the development of capital markets in many developing countries including Nigeria in the last twenty years or so.

Owinyo (2017) conducted an effect study on the economic results of occupational pension schemes in Kenya by regulating the retirement benefits industry. The research set out to explore whether regulatory enactment had an important effect on retirement schemes' economic performance. A sample of thirty occupational pension benefit systems from information collected from scheme administrators was chosen. The total contributions and fund values for each sample plan were evaluated for each of the five years preceding and five years post-2000. Using the matched or paired t-test, results suggested that the economic performance of the occupational pension benefit schemes population during the period during which the laws were in place had an important benefi-



cial effect.

Chovancova et al. (2019) looked at how the stock and bond markets affect the pension fund. The study looked into the relationship between the stock market, bond market, and pension funds. The research was based on data from the Organisation for Economic Cooperation and Development's pension statistics. The bond market had a greater impact on pension fund performance.

Coskun, Seven, Ertugrul and Ulussever (2017) investigate the links between the development level of capital market sub-components, involving mutual/pension funds, corporate bond, stock and government bond markets, and economic growth over the period of 2006:M1 and 2016:M6 in Turkey. Findings indicate the existence of co-integrating relationship between capital market development and economic growth and also a unidirectional causality running from capital market development to economic growth.

To provide further evidence, Fufa and Kim (2018) examined whether the relationship between stock markets, banks, and economic growth becomes more evident as more homogeneous groups of countries are considered. The dynamic panel generalized method of moment estimator is employed using data of European and non-European high-income countries as well as upper and lower middle-income countries averaged over five and three years. Results indicate that the association between financial development and economic growth depends on the stages of economic growth of the countries. Countries with similar homogeneities exhibit a disassociated relationship between stock market and economic growth.

A study by Orbunde, Lambe, and Bako (2019) investigated the impact of pension fund investment on capital market performance in Nigeria. The study adopted Ordinary Least Square (OLS) in order to compare the relationship among the variables of interest. Variables of interest comprise of Market Capitalization, All Share Index and Debt Capitalization while the study period is from 2008-2018. To achieve these objectives, relevant secondary data were sourced from different sources. The result reveals that Pension Fund Net Asset value has a positive and significant effect on Market Capitalization and Debt Capitalization but negative and insignificant effect on the All Share Index of the economy. It is recommended that PENCOS should ensure effective monitoring, supervision and enforcement of the provision of the PRA2004, which are the inevitable ingredients in the Contributory Pension Scheme towards Gross Domestic Product (GDP). Also, more emphasis should be placed on the management of pension assets in the capital market as well as government bond, real estate, investment trust to boost Gross Domestic Product (GDP) of the country (Nigeria).

Oluitan and Falode (2020) on their part examined Pension Fund Assets (PFA) and Infrastructural Financing (INFF) in Nigeria. The Generalized Methods of Moment was used to analyze secondary data of Pension Fund Administrators. The findings show that PFA has a positive and significant effect on INFF. GDP and PFA ratio was found significant in INFF positively and Capital expenditure



and PFA ratio had a positive and significant effect on INFF. Inflation however has a negative and significant effect on INFF. The paper recommends PFA as an alternative source of INFF provided measures are taken to prevent its abuse.

Iwegbu (2020) in a study examined the indirect effect of pension fund on economic growth in Nigeria through the financial system. Using Autoregressive Distributive Lag (ARDL) model, the study found out that pension fund contribution is effective in stimulating growth through investment in portfolios that yield short term returns; this implies that pension fund contribution cannot on its own without a credible financial system impact on economic growth. The policy implication of this study is for Pension Fund Administrators (PFAs) to invest in portfolios with short-term returns; thus, a large chunk of funds invested in federal government securities should be unbundled to other portfolios that yield short-term returns.

The study of Sanusi and Kapingura (2021) explored the impact of accumulated pension funds on the investment level and economic growth in South Africa using Bayesian Linear Regression (BLR) model. Time series data on Gross Domestic Product (GDP), total official pension funds and gross fixed capital formation (as a proxy for total investment level) from 1990 (Q1) to 2019 (Q3) were employed. The study makes use of MCMC (Markov Chain Monte Carlo) algorithm to obtain regression model parameters. The empirical findings from Bayesian Linear Regression estimation suggest that the mean effects of pension funds on economic growth and investment level in South Africa are approximately zero. The empirical conclusion is further corroborated by FMOLS results, which show that accumulated pension funds have no significant impact on the overall investment level and economic growth in South African economy. The study recommends that policymakers and the pension funds regulators have to come up with workable means by which pension funds can be invested to significantly benefit the economy; at the same time, ensuring the safety of the invested funds so as not to jeopardize the interest of pension funds owners and understanding of the informal sector.

The study of Nnaji (2021) examined the effect of pension industry's delay on pensioners in Nigeria. The study used Ex-post facto research design. Its specific objectives were to examine the effect of Pension fund investment in Federal government bonds, Pension fund investment in State government bonds and Pension fund investment in Private sector bonds on financial intermediation in Nigeria. Ordinary Least Square regression was used as analysis technique. It was found that Pension fund investment in Federal government bonds has positive and no significant effect on financial intermediation in Nigeria; Pension fund investment in State government bonds has negative and no significant effect on financial intermediation in Nigeria; and Pension fund investment in Private sector bonds has positive and no significant effect on financial intermediation in Nigeria. This implies that a unit change in pension fund investment do not lead to significant increase in financial intermediation. Based on the findings of the

study it was concluded that pension industry investments have insignificant effect on depth and liquidity of financial intermediation in Nigeria. It was recommended that the pension industry should spread its investments beyond financial instruments in order to widen its investments portfolio and aid a larger sphere of the economy with its intermediation.

Akpeghughu and Igoni (2021) assessed the impact of pension contributory funds on economic development in Nigeria with the application of time series data between 2004 and 2019. The study adopted the Error Correction Model (ECM) to analyze the long-run co-integration, Parsimonious short-run response and the Granger Causality. The co-integration technique results indicated a long run relationship between pension contributory funds and economic development (per capita income). The study further revealed in the ECM short run results that both the Private and public sector pension growth rates influenced the growth of per capita income in Nigeria at the minimal standard. The Granger causality results showed that pension contributory funds flow from the public sector and promoted the growth rate of the private sector within the Nigerian economy. The study recommended the Pension Administrators to constantly educate the employees both in the private and public sectors about the scheme benefit, and should also imbibe the culture of investing the inflows of funds contributed by the employees for short-term returns. Finally, employees should further be given financial and investment education by the employers to prepare their minds for an alternative livelihood when retired from active service.

Oyedokun, Akingunola and Somoye (2022) examined the effect of pension investment on financial depth 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 the 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.

Abdullahi, Obadare and Anifowose (2022) embarked upon a study to provide empirical evidence on the effect of contributory pension scheme on economic growth in Nigeria. Data for the study were secondary sourced from various records of PENCOM Annual Reports and CBN Bulletin (database). The data were computed with the use of Statistical Package for Social Sciences (SPSS). It was concluded that pension fund assets and pension contribution/savings mobilized over the years have positive and insignificant impact on economic growth. The implication of this finding is that the authorities concerned have not been able to use the pension fund asset and savings mobilized to boost economic growth in Nigeria. It was therefore recommended that, there should be more emphasis on the management of pension assets in the capital market as well as government bond, real estate and investment trust to boost Gross Domestic Product (GDP) of the country (Nigeria). Secondly, there should be prompt reconciliation between Pension Fund Administrators (PFAs) and Pension Fund Custodians. This will bring transparency and accountability to the system. Finally, PENCOM should ensure effective monitoring, supervision and enforcement of the provision of the PRA 2004, which are the inevitable ingredients in the Contributory Pension Scheme towards Gross Domestic Product (GDP).

Morina and Grima (2022) analyzed the impact of pension asset investments on the economic growth of selected non-OECD countries, taking into account the controlling effect of gross fixed capital formation, domestic credit to the private sector, inflation, public debt and population. To conduct the econometric analysis in this study, the authors relied on secondary data published in the annual reports of the OECD, the World Bank and the IMF. Based on the econometric results of this study, the authors conclude that the investment of pension fund assets has positively impacted the economic growth of selected non-OECD countries (2002-2018). This study is of scientific importance because it provides detailed empirical evidence regarding the investment of pension funds in international financial markets and the effects of these investments on the economic growth of non-OECD countries. Moreover, the authors of this study through this scientific paper provide new scientific evidence to governments and policymakers in these countries on how to design appropriate strategic investment policies so that pension funds invest their pension assets at a safe rate of return from investments to ensure economic growth and efficiency in the capital markets. Given that most non-OECD countries are emerging and transition economies, the importance of this study lies in the fact that the authors, through empirical findings, highlight the importance of pension fund investments in global financial markets and the effects of these investments on the economic growth of these countries.

Bakare (2022), using time series secondary data retrieved from the National

Pension Commission and the Nigerian Exchange Group for the periods 2005 Q1 through 2019 Q4, explored the effect of contributory pension funds on capital market performance in Nigeria. The study's particular goals were to look into the effect of pension funds investment in government securities, corporate securities, and real estate property in Nigeria on capital market performance. It used an ex post facto research approach, and the data were subjected to a stationarity test, which revealed that they were stationary at first difference. The study uses the Johansen co-integration test to conduct a co-integration test, the results of the co-integration test demonstrated that the variables have a long-term relationship. Pension funds' investments in government and corporate securities have a significant positive effect on capital market performance in Nigeria in both the long and short run, whereas pension funds' investments in real estate property have no significant effect on capital market performance in Nigeria in the long or short run. The study suggests that pension fund investments have had a favorable effect on the expansion of the Nigerian stock market. According to the study, administrators of pension funds should allocate more assets and investments in government securities because they are a less hazardous and safer investment option.

Udoka, Bassey, John and Orok (2022) examined contributory pension fund assets on the economic performance of Nigeria. The study adopted the exploratory research design and employed the ordinary least square (OLS) estimation technique within the modeling framework of autoregressive distributive lag (ARDL) analytical methods in testing and in the estimation of the relevant equations. The findings from the analyses revealed that the relationship between pension fund assets and real capital market capitalization in Nigeria was found to be positive and significant in the long run as well as in the short run. In conclusion, contributory pension fund asset has an effective and efficient capacity in boosting economic performance (capital market capitalization) in Nigeria. Based on the findings from this study, there should be more investment of pension funds in ordinary shares, government securities, money market instruments, and other forms of assets in order to boost credit to the core private sector in Nigeria.

Sani, Sani and Hassan (2022) noted that in recent years, the performance of pension contribution funds administrators in Nigeria has been rated as unsatisfactory, negatively impacting the ambitions of retirees. The research was conducted in Nigeria, and annual data sets on pension contributions and other macroeconomic factors were acquired for the years 2004 through 2020. The long and short run dynamics of some macroeconomic variables and pension contribution were analyzed using the Auto-regressive Distributed Lag method. The analysis demonstrates a positive and significant association between exchange rate and pension contributions in both the long and short run. Similarly, inflation rate demonstrates a negative and statistically significant link with pension contributions in both the long and short run. The results also show that the Error Correction Model (ECM) coefficient has the correct sign: negative, less than

one, and statistically significant which means that, the system will correct itself at a rate of 38 percent from the short to the long run. The study concludes that there should be concerted efforts by the government to curve the excessive inflation rate down, deposit rate should be monitored and always relate it to pensioners fund in order to maintain its financial sustainability.

Orlu (2022) examined contributory pension schemes and workers' productivity in the University of Port Harcourt. The paper was anchored on a life cycle theory. A descriptive research design was adopted for the study. Data were gathered through secondary and primary sources. The primary data were gotten from the researcher's personal observations and a self-made questionnaire structured on a four likert scale. Simple random sampling was used in the selection of a manageable sample size and the distribution of the researcher's instrument to the respondents. The retrieved questionnaires were subjected to statistical analysis through the use of means and standard deviations. The criterion mean for decision making was at 2.5. That is, any mean above 2.5 is accepted while the alternative is rejected. The paper revealed that low coverage of the scheme, inadequacy of benefits from the pension scheme, poor awareness of contributory pension schemes, poor outreach of the management of pension schemes and non-compliance by the government are the major challenges bequeathing the contributory pension scheme at the Federal University of Port Harcourt.

Ahmed and Opusunju (2022) investigated determinants of efficiency of pension fund administrators in Nigeria. The study used ex-post facto research design. The population of the study comprised 21 pension fund administrators registered by the National Pension Commission in Nigeria. The study used purposive sampling method to select 10 registered Pension Fund Administrators. The study collected data from the companies' financial statements and used panel regression to analyze the data. The study found that determinants of efficiency of listed Pension administrators in Nigeria include short term debt to total and total debt to total asset. Total debt to total asset was found to have a negative and statistically significant effect on efficiency of pension administrators in Nigeria. The study recommended that pension fund administrators in Nigeria should to obtain short term debt and also ensure more realization of total asset since it can enhance efficiency. Total debt to total asset should be maintained in order to increase efficiency of pension fund administrators.

Ndum and Okoye (2022) assessed the relationship between Pension Fund Asset Investment and Economic Growth in Nigeria utilizing time series data spanning for a twelve year period, from 2006 to 2017. Secondary data for the period were collected from the National Pension Commission (PENCOM) Annual Reports, Central Bank of Nigeria, National Bureau of Statistics and World Bank development indicator (database) of twenty-one licensed pension fund administrator as at 31st December, 2017. The data collected were analyzed and tested for unit root, using the Augmented Dickey-Fuller test using E-Views statistical

software. The Ordinary Least Square techniques were used to estimate three models in line with the formulated hypotheses. The results from the models revealed a significant positive relationship between pension fund assets, pension fund contribution, pension fund investment and gross domestic product at 5% level of significance. Consequently, it was recommended inter alia that there should be more emphasis on the management of pension assets in the capital market as well as government bond, real estate and investment trust to boost Gross Domestic Product (GDP) of Nigeria.

Okoye, Innocent, Nwobia and Ibechole (2022) examined the effect of Pension Contribution (PC) on economic growth in Nigeria. The time series data used in this study were for a period of twelve years (2005-2017). Data were collected from the Annual Reports of National Pension Commission (PENCOM). The study anchored its theory on the “theory of intermediation” and the study also employed sophisticated econometrics statistical tools like unit root test, the ordinary least square, and granger causality test. The econometric results indicated that PC has negative and insignificant relation. The insignificant relationship of PC on economic growth in Nigeria could also be as a result of Pension fund looting and non-remittance of pension contribution over the years. This study therefore recommends that efforts should be intensified to incorporate pension as a course of study in our higher institutions of learning, just as we have insurance as a course of study in our higher institutions, and also regulatory authorities should collaborate and generate a Reporting Software’s and data base of the names of organizations whose staff ought to contribute. This will make the supervisory function of the regulatory authority more efficient and effective.

Ogonda and Okiakpe (2022) examined the link between pension fund investment and Nigeria’s economic development. The study used investments in money market instruments, federal government securities, quoted ordinary shares, and corporate loan instruments as indicators of pension fund in Nigeria; while human development index (HDI) was used to represented economic development. National Pension Commission, World Bank, and National Bureau of Statistics secondary time series data from 2004 to 2020 were used and analyzed using descriptive statistics, correlation, and Fixed/Random Effects Regression Model. The study found that pension fund investments in money market instruments had a negative and insignificant influence on HDI, while pension fund investment in federal government securities had a positive and insignificant effect on HDI. Pension fund investment in quoted ordinary shares and corporate debt securities have positive influence on Nigeria’s economic development in terms of the HDI. The study concludes that pension fund investment influence economic development in terms of HDI and recommends that, for improved economic development in terms of HDI, pension funds should be invested more in ordinary shares and corporate debt securities; and that pension fund investment in money market instruments should be discouraged while investment of pension funds in federal government securities should be done with caution.

## 2.7. Hypotheses Formulations

From the above empirical review, the following hypotheses were deduced in null forms:

H<sub>01</sub>: There is no deterministic short-run and long-run impact of pension contributory fund on all Share index as a ratio of Gross Domestic Product (GDP) in Nigeria.

H<sub>02</sub>: There is no deterministic short-run and long-run impact of pension investment on all share index as a ratio of Gross Domestic Product (GDP) in Nigeria.

H<sub>3</sub>: There is no significant impact of inflation on all share index as a ratio of Gross Domestic Product (GDP) in Nigeria

H<sub>4</sub>: There is no significant causality between the pension contributory fund on all share index as a ratio of Gross Domestic Product (GDP) in Nigeria.

H<sub>5</sub>: There is no significant causality between the pension investment on all share index as a ratio of Gross Domestic Product (GDP) in Nigeria.

## 2.8. Literature Gaps

There is no doubt that, a lot of studies have been done similar to this current study. Majority of these studies analyzed number of cases pertaining to pension funds and their impact on capital market development. These include how pension funds perform various roles in various aspects of economic development, the challenges, prospects and success in their respective countries. However, when going through these reviewed literatures thoroughly, it may be noticed that, there are very few studies which explored on pension funds influence to the capital market development. This justifies the necessity of carrying out the new study so as to address the identified existing gap in the academic realm of Nigeria. Many authors have tried to establish the empirical connection between pension funds and capital market development using different samples of countries and methodology. The studies of [Iwegbu \(2020\)](#), [Owinyo \(2017\)](#), and [Babalos and Stavroyiannis \(2020\)](#) all established a positive relationship between pension funds investment and capital market development but in a static approach rather than a dynamic relationship considering the fact that pension fund investment and capital market development are a dynamic phenomenon. This study therefore extended the methodology of previous studies to incorporate other market variables in our models to test the dynamic relationship between pension fund investment and capital market development. Also, various studies that have established the relationship between pension funds and capital market development have not looked at the short run and long run dynamic impact between the two subject matters. Hence, the use of ARDL methodology.

## 3. Methodology

In the course of this study, the researcher adopted the ex-post facto research



design. Since this study focuses on the assessment of the impact of pension fund on capital market development, the data used for analysis were extracted based on the objectives of the study. The population of the study is the entire economy of Nigeria across all sectors in aggregate form. This study sourced for data through secondary means that were generated from the annual reports of Central Bank of Nigeria Statistical Bulletin, National Bureau for Statistics (NBS) and Securities and Exchange commission (SEC) for various years ranging from (1995-2022).

### Model Specification

This study adapted the model of Abu (2009) with little modifications. Thus the model that was used for this study is stated below:

$$ASI2GDP_t = \gamma_0 + \gamma_1PENFUND_t + \gamma_2PENINVEST_t + \gamma_3INFLAT_t + \mu_t \quad (1)$$

where;

$ASI2GDP_t$  is the total market capitalization in time  $t$ ;

$INFLAT_t$  is the inflation rate at time  $t$ ;

$PENFUND_t$  is the pension contributory fund at period  $t$ ;

$PENINVEST_t$  is the total pension investment at period  $t$ ;

$\gamma_0$  is the intercept,

$\gamma_1$  to  $\gamma_3$  are the coefficients and  $\mu_t$  is the stochastic error term/disturbances.

## 4. Findings

### Pre-Test Analysis

#### Descriptive Statistics Results for All Share Index as a Ratio of GDP Model

The summary of the statistics used in this empirical study is presented in the **Table 1** below. It can be observed that inflation (INFLAT) has the lowest mean value of 13.75143 and all share index as a ratio of GDP (ASI2GDP) has the highest mean value of 52993.30 whereas the mean value of pension contributory fund (PENFUND) and pension investment are 185.4111 and 2748.240 respectively. The standard deviation measures how concentrated the data are around the mean, hence it can be observed from the study presented in **Table 1** that all

**Table 1.** Descriptive statistics results test for all share index as a ratio of GDP model.

	ASI2GDP	PENFUND	PENINVEST	INFLAT
Mean	52993.30	185.4111	2748.240	13.75143
Std. Dev.	32894.72	194.7007	2823.901	5.829539
Skewness	0.756146	2.135509	0.605073	0.840476
Kurtosis	3.300312	7.278874	1.737720	3.106303
Jarque-Bera	2.773419	42.64209	3.567435	3.309713
Observations	28	28	28	28

Source: Author's Computation, (2023).

share index as a ratio of GDP (ASI2GDP) is the largest with the value of 32894.72 while inflation (INFLAT) is the lowest value of 5.829539 giving the implication that the values for the operational data values are further from the mean on averages. The measure of how asymmetric a distribution can be called skewness. All the variables were positively skewed, meaning that the mass of the distribution is concentrated on the right (that is, it is said to be left-skewed). The implication of this is that the skewness tends to say more on the mean value of the distribution being higher or lower than the median. Hence, positively skewed value indicates a higher mean value over the median value. On the part of Kurtosis, all the variables used present positive values which mean that the distribution is leptokurtic (too tall).

#### Unit Root Test

This study proceeds to examining the stochastic properties of the variables considered in the model by analyzing their order of integration based on a series of unit root test using Augmented Dickey Fuller unit root test).

From the Augmented Dickey Fuller unit root **Table 2** below, it could be seen that all share index as a ratio to GDP (ASI2GDP), pension contributory fund (PENFUND) and pension investment (PENINVEST) are all non-stationary series in first difference except inflation (INFLAT) which is stationary at level; meaning that variables such as ASI2GDP, PENFUND and PENINVEST are of order 1 while only INFLAT is of order 0. This justifies the reason to embark on the ARDL estimation.

#### Estimation of the ARDL Models for ASI2GDP Model for Capital Market Development

There is no deterministic short-run and long-run impact of pension contributory fund on

All share index as a ratio of Gross Domestic Product (GDP) in Nigeria. The result of the hypothesis is presented in **Figure 1** showing the model criteria selection graph and **Table 3** showing the bound test, after which the estimation was broken down into its short run and long run components as well as the speed of adjustment to equilibrium in the case of disequilibrium.

**Table 2.** Augmented dickey fuller (ADF) unit root test result for capital market development.

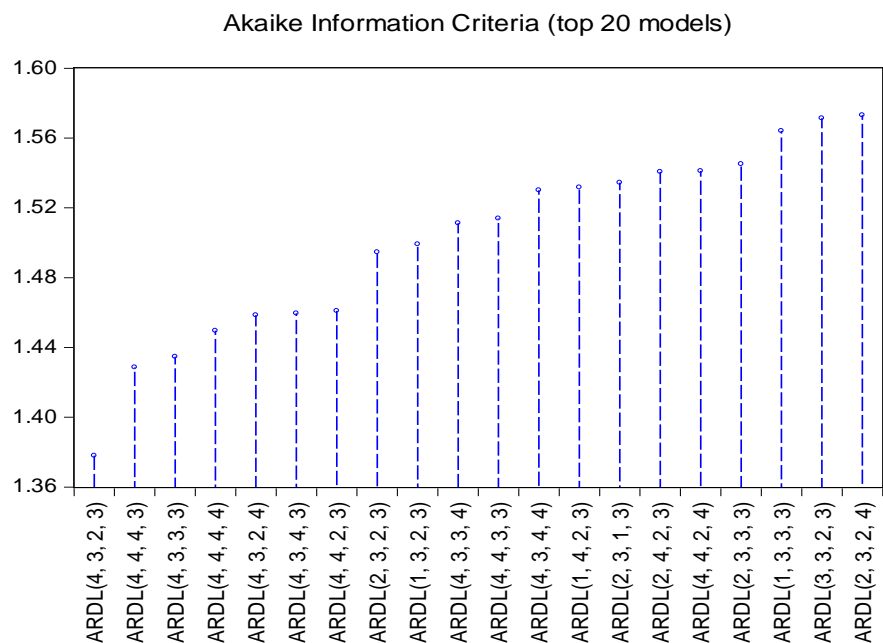
VARIABLES	LEVEL		FIRST DIFFERENCE		ORDER IN INTEGRATION
	ADF Value	Mackinnon Critical Values	ADF Value	Mackinnon Critical Values	
ASI2GDP	-2.781484	-3.587527	-5.905998	-3.595026**	1(1)
PENFUND	-1.495562	-3.595026	-3.576188	-3.658446**	1(1)
PENINVEST	-3.117782	-3.622033	-4.259252	-3.603202**	1(1)
INFLAT	-3.329771	-3.587527**	-4.512223	-3.612199	1(0)

Source: Author's Computation, (2023).

**Table 3.** The bound test for co integration.

ASI2GDP Model—For Capital Market Development		
Test Statistics (K)	3	
F-Statistics	6.560358	
Critical Value Bounds	I (0) Bound	I (1) Bound
10%	2.72	3.77
5%	3.23	4.35
2.5%	3.69	4.89
1%	4.29	5.61

Source: Authors' Computation, (2023).



**Figure 1.** The best 20 models, among which the overall best is automatically chosen for the estimation of the ARDL for ASI2GDP model for capital market development. Source: Author's Computation, (2023).

**Model Selection—Criteria Graph for ASI2GDP Model for Capital Market Development**

Figure 1 gives the values of the Akaike information criterion for the estimated ARDL model, the purpose is to see clearly that the model that minimizes the AIC is chosen given the maximum lag selected.

**Cointegrating Bound Testing for ARDL Models Estimation for ASI2GDP for Capital Market Development**

As presented in Table 3, the parameters k is simply equals to total variables minus one that is 3. Cointegration is tested on ASI2GDP Model using each of the measures of capital market development as the dependent variable. The findings reveal that the F-statistic is higher than both the lower and upper bound critical value at the 1%, 2.5%, 5% and 10%, level of significance using restricted

intercept and no trend in all the specifications. The findings therefore suggest the presence of cointegration among each of the individual measures of capital market development. Based on the results, the null hypothesis of no cointegration is rejected. Therefore, this implies that the measure of capital market development is all bound by a long run relationship in Nigeria. The study therefore moves on to the estimation of the short run and long run situations as presented on the tables to follow:

#### **ARDL Short run Estimates for Capital Market Development Model for ASI2GDP**

The short run cointegrating form of the models is presented on **Table 4**, in which the coefficients of the error correction model for all the three specifications is presented. The coefficient of Error Correction Mechanism (speed of adjustment) is negative as expected and significant at 5% level. The coefficients suggest that over 86% of the short run disequilibrium is corrected in the long run equilibrium in each of the three specifications.

#### **ARDL Long run Estimates for Models for ASI2GDP—Capital Market Development**

**Table 5** presents above the short run and long run dynamic impact of pension contributory fund on capital market development proxied by all share index as a ratio of Gross Domestic Product using ARDL approach. The findings from the Market Capitalization model specification showed that the error correction model's coefficients suggest that over 86% of the short run disequilibrium is corrected in the long run equilibrium in of the specification. Meaning that there is short run dynamic impact between pension contributory funds and capital market development measured by all share index to GDP. Moreover, the study found the coefficient of values of pension contributory fund, pension investment and inflation to be positively significant with capital market development proxied with all share index as a ratio to GDP.

**Table 4.** Summary of the estimation of the short run (Speed of Adjustment) ARDL models for model for ASI2GDP.

Models	Variable	Coefficient	Std. Error	t-Statistic	Prob.
<b>ASI2GDP Model</b>	CointEq(-1)	-0.858042	0.474044	-3.919555	0.0044

Source: Authors' Computation, (2023).

**Table 5.** Summary of the estimation of the long run ARDL models for ASI2GDP—capital market development.

Variables	Coefficient	Std. Error	T-Stat	P-Value
PENFUND	0.482759	0.305720	1.579087	0.0030
PENINVEST	0.735776	0.150232	4.897604	0.0012
INFLAT	1.876749	0.477006	3.934433	0.0043
C	7.142935	1.011002	7.065206	0.0001

Source: Authors' Computation, (2023).

### Estimation of Multivariate Granger Causality

The result of the multivariate granger causality test as shown in **Table 6** revealed at aggregate level, a bidirectional causality among pension contributory fund, pension investment, inflation and all share index as a ratio of Gross Domestic Product (GDP) in Nigeria; suggesting that the relationship was important and that the relationship among pension contributory fund, pension investment, inflation and all share index as a ratio of Gross Domestic Product (GDP) in Nigeria was two-ways. Meaning that as pension contributory fund, pension investment, inflation all influence all share index as a ratio of Gross Domestic Product (GDP), all share index as a ratio of Gross Domestic Product (GDP) also influence pension contributory fund, pension investment, inflation. This decision was based on the values of F-statistic and probability. From **Table 6**, it is observed that the F-statistics [(4.14172 and 0.07323); (2.47487 and 0.66823)]; and a significant probability values [(0.0084 and 0032); (0.0005 and 0096)].

### Diagnostic Result

In other to test for the diagnostic test in the study, the result can be obtained from **Table 7**.

From **Table 7** below, the Breusch-Godfrey Serial Correlation LM test for the two models reveals that there is no presence of serial correlation judging from the F-Statistics and the probability values which are greater than 0.05. Also, the heteroskedasticity ARCH LM test for the two models reveals that there is no

**Table 6.** Estimation results of multivariate granger causality.

Null Hypothesis	Obs.	F-statistics	Probability
PENFUND does not Granger Cause ASI2GDP	26	2.47487	0.0084
ASI2GDP does not Granger Cause PENFUND	26	0.66823	0.0032
PENINVEST does not Granger Cause ASI2GDP	26	4.14172	0.0005
ASI2GDP does not Granger Cause PENINVEST	26	0.07323	0.0096

Source: Authors' Computation, (2023).

**Table 7.** Residual diagnostic test and stability diagnostic test result.

Residual Diagnostic Test Result			
	Tests	F-statistic	Probability
ASI2GDP—All Share Index Model	Breusch-Godfrey Serial Correlation LM Test:	0.507886	0.6141
	Heteroskedasticity Test: ARCH	2.526381	0.5553
Stability Diagnostic Test Result			
	Tests	F-statistic Values	Probability
ASI2GDP—All Share Index Model	Ramsey RESET Test	1.867961	0.1949

SOURCE: Authors Computation (2023).

heteroscedasticity problem judging from the F-Statistics and the probability values which are greater than 0.05. However, the stability test result using Ramsey RESET test shows that the two models were very stable considering the probability value that were greater than 5%.

## 5. Discussions

### **Short run and Long run dynamic impact of pension contributory fund on all share index as a ratio of Gross Domestic Product (GDP) in Nigeria**

The first objective of this study is to examine the impact of short run and long run dynamic impact of pension contributory funds on all share index as a ratio of Gross Domestic Product (GDP) in Nigeria. The finding of this study reveals that there is a short run relationship between the dependent and the independent variables. It also means that there is a high speed of adjustment in the model and that if there is any disbalance in this system, it takes an average speed of 86 % to return back from the short run to the long run. Based on the long run co-integration of the independent variables, the coefficient of pension contributory funds was found to be positively significant with capital market development proxied with all share index as a ratio to GDP at 5%. The finding of this study agrees with the finding of (Orbunde, Lambe, & Bako, 2019; Coskun, Seven, Ertugrul, & Ulussever, 2017; Chovancova et al., 2019; Zubair, 2016).

### **Short run and Long run dynamic impact of pension investment on all share index as a ratio of Gross Domestic Product (GDP) in Nigeria**

The second objective of this study is to examine the impact of short run and long run dynamic impact of pension investment on all share index as a ratio of Gross Domestic Product (GDP) in Nigeria. The finding of this study reveals that there is a short run relationship between the dependent and the independent variables. It also means that there is a high speed of adjustment in the model and that if there is any disbalance in this system, it takes an average speed of 86% to return back from the short run to the long run. Based on the long run co-integration of the independent variables, the coefficient of pension investment was found to be positively significant with capital market development proxied with all share index as a ratio to GDP at 5%. The finding of this study agrees with the finding of (Orbunde, Lambe, & Bako, 2019; Coskun, Seven, Ertugrul, & Ulussever, 2017; Chovancova et al., 2019; Zubair, 2016).

### **Impact of Inflation on all share index as a ratio of Gross Domestic Product (GDP) in Nigeria**

The third objective of this study is to examine the impact of inflation on all share index as a ratio of Gross Domestic Product (GDP) in Nigeria. The finding of this study reveals that the coefficient of inflation was found to be positively significant with capital market development proxied with all share index as a ratio to GDP at 5%. The finding of this study agrees with the finding of (Orbunde, Lambe, & Bako, 2019; Coskun, Seven, Ertugrul, & Ulussever, 2017; Chovancova

et al., 2019; Zubair, 2016).

#### **The Causal Relationship between Pension Investment and Market Capitalization as a Ratio of Gross Domestic Product in Nigeria**

The fourth objective of this study is to determine to evaluate the causal relationship between pension investment and market capitalization as a ratio of gross domestic product in Nigeria. The finding of this study reveals that at aggregate level, a bidirectional relationship exists between pension investment and market capitalization as a ratio of gross domestic product in Nigeria suggesting that the relationship between pension investment and market capitalization as a ratio of gross domestic product in Nigeria was a two-ways, meaning that as pension investment influences market capitalization as a ratio of Gross Domestic Product (GDP), market capitalization as a ratio of Gross Domestic Product (GDP) also influences pension investment. The finding of this study agrees with the finding of (Orbunde, Lambe, & Bako, 2019; Coskun, Seven, Ertugrul, & Ulussever, 2017; Chovancova et al., 2019; Zubair, 2016).

#### **The Causal Relationship between Pension Contributory Funds and All Share Index as a Ratio of Gross Domestic Product in Nigeria**

The fifth objective of this study is to determine to evaluate the causal relationship between pension contributory funds and all share index as a ratio of gross domestic product in Nigeria. The finding of this study reveals that at aggregate level, a bidirectional relationship exists between pension contributory funds and all share index as a ratio of gross domestic product in Nigeria suggesting that the relationship between pension contributory funds and all share index as a ratio of gross domestic product in Nigeria was a two-ways, meaning that as pension contributory fund influences all share index as a ratio of Gross Domestic Product (GDP), all share index as a ratio of Gross Domestic Product (GDP) also influences pension contributory fund. The finding of this study agrees with the finding of (Orbunde, Lambe, & Bako, 2019; Coskun, Seven, Ertugrul, & Ulussever, 2017; Chovancova et al., 2019; Zubair, 2016).

#### **The Causal Relationship between Pension Investment and All Share Index as a Ratio of Gross Domestic Product in Nigeria**

The sixth objective of this study is to determine to evaluate the causal relationship between pension investment and all share index as a ratio of gross domestic product in Nigeria. The finding of this study reveals that at aggregate level, a bidirectional relationship exists between pension investment and all share index as a ratio of gross domestic product in Nigeria suggesting that the relationship between pension investment and all share index as a ratio of gross domestic product in Nigeria was a two-ways, meaning that as pension investment influences all share index as a ratio of Gross Domestic Product (GDP), all share index as a ratio of Gross Domestic Product (GDP) also influences pension investment. The finding of this study agrees with the finding of (Orbunde, Lambe, & Bako, 2019; Coskun, Seven, Ertugrul, & Ulussever, 2017; Chovancova et al., 2019; Zubair, 2016).



## 6. Conclusion and Recommendations

Pension fund systems have undergone substantial reforms over the last twenty years. Consistently with this development, the recent growth in pension fund investments in equities has attracted the interest of academics and researchers to the interaction between stock market development and pension funds. It has also long been recognized that pension systems across the emerging markets including Nigeria have undergone dramatic reforms over the last twenty-eight years. This process has mainly been fueled by the demographic problem faced by modern economic systems. One question that sparks this study is whether the evolution of pension funds enhances the well-being of capital market development. Capital market data provide evidence in favour of the dominant role of pension funds in capital markets worldwide but its influence on Nigerian capital market is still questionable.

The importance of this pension funds to the Nigerian capital market development performance is very significant as they contribute sizeable portion to the country's Gross Domestic Product (GDP). The main objective of the study is to examine the impact of pension funds on capital market development in Nigeria. This study has empirically examined the long run and short run dynamic of pension funds on capital market development of Nigeria using the ARDL and multivariate granger causality approach over the period 1995-2022.

Therefore, this study recommends that:

- 1) The accumulated pension fund asset in Nigeria needs to be secured by market discipline for management and investment of the pension fund assets.
- 2) Strengthening the pension fund investment and management plans can be an efficient policy response to a lack of risk-taking attitude by investors in the Nigerian capital market which can revamp the market to the bullish trend as experienced before the financial meltdown.
- 3) The Nigerian monetary authority should fortify the inflation policy of capital market by liaising with development finance institutions (DFIs) to access an array of methods to facilitate domestic bond issuances and access to long-term finance for firms and infrastructure projects that is consistent with pension fund investment objective.

### Contribution to Knowledge

This study has the following contributions to knowledge: Firstly, this study revealed that the level of the long run and short run dynamic of pension funds measured by pension contributory funds, pension investment and inflation on capital market development measured by all share index as a ratio of GDP in Nigeria using the ARDL and multivariate granger causality approach over the period 1995-2022. Secondly, this study revealed a positive and significant dynamic short run and long run impact on capital market development with an updated year (1995-2022). Thirdly, this study revealed the causal relationship between pension funds measured by pension contributory funds, pension in-

vestment and inflation on capital market development measured by all share index as a ratio of GDP in Nigeria using multivariate granger causality from 1995-2022. Lastly, this study used the Autoregressive distributed lag bound testing to establish the dynamic impact between the subject matters.

### **Limitations of the Study and Suggestion for Further Research**

In this study, there are limitations that need improvement for future studies. They include:

- 1) This study recommends that future studies should incorporate collection of more control variables (macroeconomic variables such as exchange rate, interest rate and money supply) which would add value to Nigeria context and situation.
- 2) This study also recommends future studies into the assessment of pension funds measured by pension contributory funds, pension investment and inflation on economic growth in Nigeria using.
- 3) The study was only conducted in Nigeria, so the results of this study may not be the same if applied to other continents. In a subsequent study, it is suggested that research should be conducted on diverse continents, such as Sub-Saharan African countries, so it can be used as a comparison with the results of previous studies.
- 4) This study also recommends future studies into the using other technique such as General Method of Moments (GMM) in examining the impact of pension funds on capital market development.

### **Conflicts of Interest**

The authors declare no conflicts of interest regarding the publication of this paper.

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