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PENSION FUNDS AND CAPITAL MARKET DEVELOPMENT IN NIGERIA

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Abstract

This study examines the effect of pension funds on capital market development in Nigeria. An ex-post facto research design was employed for this study. Secondary data were collected from Central Bank of Nigeria Statistical Bulletin for forty-eight quarter periods spanning through 2008Q1 to 2019Q4. Employing the econometric methodology of the Johansen Cointegration and Vector Error Correction Model (VECM), the study shows long run relationships among the variables. The result shows that pension contributory funds have no significant effect on capital market development in Nigeria, while pension investment has significant effect on capital market development in Nigeria. The study recommends that government through its policy making should encourage more investment of the fallow pension funds into lucrative securities in the capital market. This will enhance the development of the capital market and further develop the financial sector which will in turn translate to the growth and development of the economy. Furthermore, voluntary contributions into the pension funds should be encouraged so as to the funds that will be available for investment in the capital market.

Keywords: Pension Funds, Investment, Contributory Funds, Capital Market Development

Jel. Classification Codes: G10, G23

1. INTRODUCTION

Retirement income is an extremely important component of every individual's life cycle. It can come from one of the four pillars of support in old age: unfunded state pensions (that is, transfers from the current working population via the tax system), funded private pensions (that is, from savings accumulated in private sector pension schemes), direct private savings, and post-retirement work. Throughout the world, governments are looking to funded private pension schemes to solve the problem of providing pensions to their ageing populations. A pension fund, also known as a superannuation fund in some countries, is any plan, fund, or scheme that provides retirement income. Pension funds are pooled monetary contributions from pension plans set up by employers, unions, or other organizations to provide for their employees' or members' retirement benefits (Thomas & Spataro, 2016).

The Nigerian pension system has come a long way. It began with the public-sector Pension Ordinance of 1951 as promulgated by the colonial authorities which had a retroactive effect from January 1, 1946 (Eme & Ugwu, 2011). The Pension Reform Act 2004, which was repealed and replaced with the Pension Reform Act 2014,

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established a mandatory Contributory Pension Scheme (CPS) for workers in both the public and private sectors. Section 4 of the Act, provides for a mandatory minimum contribution of ten and eight percent of employee's monthly emolument by the employer and employee respectively. Each employee is to open a Retirement Savings Account (RSA) into which the contributions are to be paid, with a Pension Fund Administrator (PFA) licensed by the National Pension Commission, established under section 17 of the Act, to regulate and supervise pension schemes in the country. The PFA is to manage and invest the fund in the RSA, from where a contributor will draw benefits on retirement, in line with the provisions of the Act. This has increased national savings Pensions fund liabilities to have a long maturity period, consequently, they are open to long term investment through long term equity stakes. As at 31, August 2018, the Nigeria's Net Assets Value of Pension Assets under the Contributory Pension Scheme was N8.3 trillion. Of the N8.3 trillion Net Assets Value, 69.30% was invested in FGN Securities, 8.33% in Ordinary shares, 11.59% in local money market securities, 1.85% in States governments' securities, 2.72% in Real Estate properties. The fund was also invested in Supra National Bonds 0.08%, Mutual Funds 0.26%, Specialised Funds (Infrastructure and Private Equity) 0.65% etc (PenCom Report, 2019).

Investment of pension fund in Federal and States governments' securities has assisted both Federal and States governments to cost-effectively manage national debts, thereby contributing to the financial needs and contributing to the financial sector development. Pension fund has come in as an independent financial intermediary, as the nation's private business enterprises no longer rely on banks as the sole sources of capital for the financing of their businesses (Dostal, 2010). The pension fund is getting into real estate, infrastructure and mutual fund. The pension fund therefore provides a domestic source of borrowing, which does not attract high interest rate. The growing size of pension assets is impacting on the financial landscape, with a growing role of institutional investors (Pension Fund Administrators) (Odia & Okoye, 2012). This is indicative that the Contributory Pension Scheme is imp active positively on the financial sector and invariably on economic growth of the nation.

The market is assumed competitive, information efficient, and commands securities priced under given homogenous expectation. The market therefore affords pension funds with diversified savings instruments, mechanism and other economic utilities for its huge resources to actualize efficient pricing and valuation of its assets. Merton and Bodie (2015) opine that these and other functions of the financial system may be improved by pension reform. In this regard the fund's superior contribution to depth, breadth and width of the capital market is particularly impressive (Carmichael & Pomerleano, 2012). Blommestein (2018) reveals that for the financial market that absolves vast amount of savings from pension funds means that financial policy makers need to be acquitted with investment and trading strategies of pension funds and activities of other allied institutions associated with managing retirement income. Kalu and Attamah (2015) argues that though both the capital market development and pension fund system are closely connected, the argument as to which comes first is hard to establish.

The potential for pension funds to contribute to capital markets and thereby economic growth has been argued on a theoretical basis and demonstrated empirically. However, reforms fostering the development of funded pension systems have not had the economic impact hoped for in some countries (Stewart, et al., 2017). One major problem facing the contributory pension fund in Nigeria is limited investment outlets for instance, there are only eleven classes of investment available for investment of pension assets which is estimated at N2, 029.77 billion (PENCOM, 2010). The investment outlets may not be enough to assimilate the accumulated pool of pension fund assets. Thus, a pool of pension funds may be chasing relatively few quality investments (Eche, 2017). Sixteen years after the introduction of contributory pension scheme in Nigeria, there is still doubt as to the ability of the scheme to solve the problem of scarcity of long-term funds for long-term investment. Olanrewaju, (2011) observed that forced savings in a low-income country with large scale poverty and inadequate complementary social security system may not be desirable in Nigeria. Pension fund portfolios in some cases have remained highly exposed to shorter-term assets, such as bank deposits and shorter-term government bonds. This, in turn, has led to relatively low investment returns, thereby potentially affecting income adequacy in retirement. There are few studies on pension fund and capital market such as: Thomas and Spataro (2016) investigated the effects of pension funds on markets performance: A review, Okparaka (2018) examined the effect of contributory pension scheme on Nigerian capital market. This paper aims to shed light on how pension funds affect capital market development by providing a systematic analysis of the pension fund investment behavior and the factors that constrain it. As such, the main objective of this study is to investigate the effect of pension funds on capital market development in Nigeria.

The following null hypotheses were tested:

- H₀₁: Pension contribution fund has no significant effect on capital market development in Nigeria.
- H₀₂: Pension investment has no significant effect on capital market development in Nigeria

2. LITERATURE REVIEW

2.1 Conceptual Review

2.1.1 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. Pension fund, also known as a superannuation fund in some countries, is any plan, fund, or scheme that provides retirement income (Vittas, 2016). Pension funds are pooled monetary contributions from pension plans set up by employers, unions, or other organizations to provide for their employees' or members'

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retirement benefits (Thomas & Spataro, 2016). According to PenCom (2014) the influence of the Pension Funds on the development of the local capital market has arisen largely through the investment of the System's resources in different securities and their trading on specific markets. Pension funds can be more or less segregated from the balance sheet of the plan sponsor. Autonomous pension funds are legally separated from the plan sponsor taking the form of either a special-purpose legal entity (a pension entity) or a separate account managed by financial institutions on behalf of the plan members (Impavido, 2013). Pension funds that support personal pension plans are, by definition, autonomous. Both in occupational and personal pension plans, the plan members have a legal or beneficial right or some other contractual claim against the assets held in the autonomous pension fund representing the financial collateral of their benefit promise.

In the opinion of Gunu and Tsado (2012) Stock broking firms stand to profits from the higher business volumes which the increased transactions on retirement bonds, corporate bonds and equities consequent upon the higher capital market operations that increase pension funds would engender. Pension funds, as well as other institutional investors, provide means of risk pooling for smaller individual investors, thus providing diversification and enhanced risk-return opportunities for end-investors. Their superior capacity to absorb and process information, and their ability to transact in large volumes, lowers the cost of intermediation and benefits investors and issuers alike (Roldos, 2014). In addition to providing better risk management and lower transaction costs, their long-term liabilities allow pension funds to invest in and contribute to the development of longer-term securities markets.

The introduction of funded pension systems allows pension funds to accumulate assets that can be invested in financial markets. Even in the case that pension savings crowd out other household savings such that the total savings in the economy do not increase, the accumulation of pension fund assets is expected to potentially promote depth and liquidity in the capital markets because of the different investment behavior between households and pension funds. With accumulating assets and the longer-term nature of their liabilities, pension funds have incentives to invest more in illiquid and long-term assets that yield higher returns, and thus provide a long-term supply of funds to the capital markets (Davis, 2015). As well, Catalan, Impavido, and Musalem (2010) argue that with their stake in illiquid pension funds, households will increase their liquidity by holding deposits in the banking sector, open-end mutual funds, and traded securities, at the expense of other illiquid assets such as real estate or non-traded financial instruments. Such behavior will also stimulate financial market development.

Pension fund activities may also induce capital and financial market development through their substituting and complementary roles with other financial institutions, specifically commercial and investment banks. As competing intermediaries for household savings and corporate financing (as noted by Impavido, Musalem, and Tressel, 2012), pension funds foster competition and may improve the efficiency of the loan and primary securities markets. This results in a lower spread between lending

rates and deposit rates, and lower costs to access capital markets. On the other hand, Davis (2015) argues that pension funds may complement banks by purchasing long-term debt securities or investing in long-term bank deposits. Other potential impacts from the growth of pension funds include an inducement toward financial innovation, improvement in financial regulations and corporate governance, modernization in the infrastructure of securities markets, and an overall improvement in financial market efficiency and transparency (Davis, 2015). Such impacts should ultimately spur higher long-term economic growth.

2.1.2 Capital Market

According to Al-Faki (2016), 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”. Nwankwo (2018) says that the capital market comprises the complex of institution and mechanism through which intermediate term funds and long-term funds are pooled and made available to business, government and individual. Ekezie (2012) noted that capital market is the market for dealings (i.e. lending and borrowing) in longer-term loanable funds. Mbat (2011) described it as a forum through which long-term funds are made available by the surplus to the deficit economic units Capital market is a collection of financial institutions set up for the granting of medium and long-term loans. It is a market for government securities, for corporate bonds, for the mobilization and utilization of long-term funds for development – the long-term end of the financial system (Osinubi, 2016).

The capital market is divided into the primary and the secondary market. The primary market or the new issues market provides the avenue through which government and corporate bodies raise fresh funds through the issuance of securities which is subscribed to by the general public or a selected group of investors. According to Soyede (2015) Primary market is a market for new securities. It is a platform where the company or government can raise money for investment or where already quoted companies can raise fresh funds for expansion. Both the Securities and Exchange Commission (SEC) and the Nigerian Stock Exchange (NSE) are involved in primary market activities. The issuing houses and stock brokers also play prominent roles.

The secondary market provides an avenue for sale and purchase of existing securities. This enhances the new issue market in many ways, it provides the means by which investor can monitor the value of their shares and liquidate them when they wish to do so. According to Pandey (2016), it is a type of market where existing securities of a market are traded on daily and continuous basis. It is the market for existing securities. This consists of exchanges and over-the counter markets where securities are bought and sold after their issuance in the primary market. The following

financial instrument traded in this market includes foreign exchange instruments, equity insurance credit market derivatives and hybrid instruments (Ekiran, 2019).

2.2 Theoretical Framework

2.2.1 Accelerator Theory

The Accelerator theory serves as the basis for this study. The accelerator theory suggests that the level of induced investment will be determined by the rate of change of national income (and not interest rate). When national income is rising rapidly, then firms will want to meet increasing demand by expanding their capacity. But as the rate of GNP growth falls, businesses will no longer need to add to capacity and so investment levels fall back to the original level necessary to maintain depreciated capital. The Accelerator theory of investment suggests that as demand or income increases in an economy, so does the investment made by firms. Furthermore, accelerator theory suggests that when demand levels result in an excess in demand, firms have two choices of how to meet demand. It is either to raise prices to cause demand to drop or to increase investment to match demand. The theory proposes that most companies choose to increase production thus increase their profits. The theory further explains how this growth attracts more investors, which in accelerates growth. The accelerator theory is an economic postulation that investments made by companies increase when either demand or income increases. The theory also suggests that when demand produces an excess of demand, companies can meet the need in two ways: decrease demand by raising prices or increase investment to the level of demand. The accelerator theory posits that companies typically choose to increase production, thereby increasing profits; this growth, in turn, attracts further investors that works to accelerate growth.

2.2.2 Modern Portfolio Theory

Modern portfolio theory (MPT) developed by Markowitz (1952) states that the rate of return variance is an important measure of portfolio risk given some assumptions that relate to the behavior of investors. According to MPT investors should not only focus on reducing overall portfolio risk through diversification but also learn effective diversification in order to be able select profitable investments. MPT assumes that investors are able maximize their return on investment for a certain risk level. However, investors are mostly risk averse thus are more likely to settle for assets with lower risk levels given different assets with equal rates of return. According to MPT, investors can minimize portfolio risk if they pay attention to the volatility of expected returns by picking assets with dissimilar price movement. Bodie et al. (2008) adds that investors when constructing their portfolio decide on the asset allocation from among the broad asset classes and select securities to hold in each asset class. This applies to the study as pension funds invest in diversified portfolios on the NSE so as to maximize on returns and minimize on the risks. Diversification of pension schemes' investment portfolio can also provoke development of new capital market instruments.

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The investments are mainly in bonds and equities which have varying risks and returns. The investments made contribute to the market capitalization, volume and value of shares traded at the NSE.

2.2.3 Efficient Market Hypothesis

This theory as advanced by Eugene (1970) explains the behaviour of a perfect market where securities are in equilibrium. According to Fama, such a market is where the security prices fully reflect all public information available and the market reacts swiftly to new information thus enabling the stocks to be fairly priced. There are three main types of market efficiencies. Weak form efficiency is where prices of assets only reflect all the past publicly available information. Semi-Strong efficiency is where prices reflect all publicly available information and they adjust to any new information. Strong form of efficiency is where prices reflect all information whether past or present, and such that no investor can benefit in form excess payoffs. Trading activities on the NSE spur financial sector development through enhancing liquidity providing a mechanism for price discovery and reduction of transaction costs. This lowers the cost of generating and disseminating of information market players thus improving efficiency (Yartey & Adjasi, 2007).

2.3 Empirical Review

Some studies have sought to quantify the impacts of pension funds on capital markets, but the literature is still relatively sparse. Catalan, Impavido, and Musalem (2010) conduct Granger causality tests on 14 OECD countries and 5 developing countries, separately, to see the causal relationship between stock market development and contractual savings institutions including pension funds. They conclude that contractual savings predominantly Granger cause stock market development. To a lesser extent, the causality happens simultaneously between them, and very slightly, the causality runs the other direction. Even though they find such causal evidence, their estimation might suffer from the small number of time period observations. For example, the number of observations is only 6 for Austria, 8 for Portugal, and 9 for Australia.

Walker and Lefort (2002) carry out a panel study using a Generalized Least Squares (GLS) estimator for 33 emerging markets and find positive links between pension reform and capital markets. They find that pension fund assets reduce dividend yields and increase price-to-book ratios, thereby implying a decrease in the cost of capital. However, they also admit that some of their estimation results may suffer severely from measurement error problems, and their conclusions are preliminary and need to be verified again when a longer period of observations becomes available.

Impavido, Musalem, and Tressel (2003) incorporate dynamic panel models to estimate the impact of contractual savings institutions on stock market and bond market development. With the use of an Arellano and Bond (1991) differenced GMM estimator

on 32 developed and developing countries, they find that contractual savings financial assets have significant impacts on stock market and bond market development. Nonetheless, with a small number of cross-section units and short time periods (six years on average in their study), the GMM estimators suffer from potentially large finite sample bias.

Meng and Pfau (2010) employed panel regression model in investigating the impacts of pension funds on capital market development across 32 developed and emerging market countries. The result revealed a positive relationship between pension fund and capital market development. However, their regression result went further to evidenced that the impact of pension fund on capital market development is only significant for countries with high financial development, and pension funds do not impact capital market development in the countries with a low level of financial development. The results suggest that countries with 'low' financial development should reconsider the management approach and investment strategies for their pension funds.

Wanjala (2013) using a multiple regression model analyzed the relationship between pension fund assets and economic growth in Kenya. Secondary data from the periods 2002 to 2011 was gathered from four (4) main institutions that included RBA, KNBS, KIPPRA, Ministry of Finance and Planning and NSSF and analyzed through SPSS software through which graphs, charts and reports were generated and interpreted. The results of the findings showed that retirement pension assets positively affected economic growth in Kenya. The findings also showed that retirement pension assets and the stock market capitalization had relatively increased in complete terms over time

Njeru (2014) carried out inferential statistics to evaluate financial performance on portfolio holdings by pension funds in Kenya. Using a sample of 35 pension funds selected through judgmental sampling, the findings suggested that the performance of equities was better than all other asset classes over a period of 1 year and 3 years. The performance was however poor over a 3-month period. Equities performed better in large funds compared to medium and small funds. Offshores had the poorest performance especially for medium pension funds. A period by period analysis revealed that the funds performed well over longer periods compared to shorter periods. The researcher also noted that a large portion of pension fund holdings have been invested on the Nairobi Securities Exchange (NSE) as opined by RBA. Few pension funds have also invested minimal amounts in property, offshore, unquoted equity and cash and cash equivalents.

Bereh, Wodung and Gyang (2014) reviewed the reform efforts in the Nigerian pension system with special emphasis on the 2004 reforms. Concepts relating to pension, reform and pension reforms were discussed. A brief survey of the history of pension reforms, from colonial Nigeria was undertaken, while factors that led to the 2004 reforms were discussed. The paper highlighted the objectives of the reforms and the strategies put in place towards their achievement. The situation of pensions in Nigeria today was examined and the challenges and achievement of the pension reforms

were also highlighted. The paper concludes that, although the reforms have achieved a lot based on its objectives, there is still room for improvement given the myriad of challenges that could cripple it if left unchecked. The paper recommended, among other things, a review of the Act to expand its scope to cover every Nigerian worker as well as making more stringent the penalties for abuse or non-compliance with the Act towards achieving socio-economic development. A case was made for the establishment of an Institute of Pension Administrators of Nigeria (IPAN) to further regulate and discipline members.

Enache, Milos and Milos (2015) used the single equation error correction model (ECM) to investigate the impact of pension funds on capital market in a sampled ten (10) Central and Eastern European Countries from 2001 to 2010. The finding provides further evidence of short term impact and lower magnitude long term impact on market capitalization. Zubair (2016) examined the impact of pension fund investments on the performance of capital market in Nigeria. The study is a time series analysis covering a period from 2009Q3 to 2016Q1 using the Autoregressive Integrated Moving Average (ARIMA) regression technique. The study concludes that there is a significant positive relationship between pension funds' investments and the performance of capital market in Nigeria after the 2004 major industry reform. 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. Moreover, the study concludes that the interaction of macroeconomic indicators such as interest rate, inflation rate and GDP per capita with pension investments affect the capital market performance significantly.

Zubair (2016) studied the effects of pension funds' investments on capital market performance 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. Moreover, the study concludes that the interaction of macroeconomic indicators such as interest rate, inflation rate and GDP per capita with pension investments affect the capital market performance significantly. Micah and Obah (2016) investigated the relationship between pension fund administration and infrastructure financing in Nigeria. 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.

Okparaka and Makwe (2019) examined the effect of pension industry investment on financial intermediation 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.

3. METHODOLOGY

The research design adopted for this study is ex post facto design. The Expost facto research design attempts to explore the effect relationship through the use of an already existing data. This study uses quarterly time series data covering the period 2008 to 2019. The variables of the study are pension contributory fund, pension investment and market capitalization. Data for the study was obtained from the Central Bank of Nigeria Statistical Bulletin 2019. Descriptive statistics was used to explain the data. A stationarity test was conducted to test for the presence of unit root in the time series data. In addition, Co-integration test was conducted to investigate possible correlation among the variables of this study. A vector error correction model was also used: Vector error correction model is a restricted type of VAR designed for use of non-stationary series that are known to be co-integrated. The model was specified as follows:

$$MCAP = f(PCF, PI) \dots\dots\dots (1)$$

The Cointegration model of the study is represented by:

$$\Delta MCAP_t = \mu + \sum_{i=1}^{n-1} \Gamma_i \Delta MCAP_{t-i} + \sum_{i=0}^{m-1} \gamma_i \Delta PCF_{t-i} + \gamma_2 \Delta PI_{t-i} + ECM_{t-1} + \varepsilon_t \dots\dots\dots (2)$$

Where: = Market Capitalization; PCF = Pension Contributory Funds; PI = Pension Investment; and ECM = Error-correction coefficient; ε = Error term; Δ = First difference operator; μ = Intercept or Constant; t_i = Time lagged; γ_1, γ_2 = Coefficient of independent variables.

4. FINDINGS AND DISCUSSIONS

4.1 Descriptive Statistics

	MCAP	PCF	PI
Mean	9890.782	3262338.	4295366.
Median	10284.07	3044991.	3949082.
Maximum	14992.96	7852569.	10218053
Minimum	4483.500	192714.9	218319.1
Std. Dev.	2843.597	2155306.	2856979.
Skewness	-0.200337	0.417749	0.367495
Kurtosis	1.902858	2.161420	2.081475
Jarque-Bera	2.728521	2.802549	2.767796
Probability	0.255570	0.246283	0.250600
Observations	48	48	48

Source: Eview Version 10 Output, 2020

The table above revealed the data used in the study with the market capitalization having a mean value of 9890.782 which means that market capitalization was good because it had capital which is greater than zero while the deviation from the mean (standard deviation) was 2843.597. This means that market capitalization was normally distributed because the standard deviation value was lower than the mean value. In like manner, it has a median of 10284.07 with skewness and kurtosis of -0.200337 and 1.902858 respectively. The maximum market capitalization as at the period of this study was 14992.96 which means that market capitalization was not more than 14992.96 while the minimum market capitalization was 4483.500.

Also, the pension contributory fund had mean value of 3262338, while the deviation from the mean (standard deviation) was 2155306. This means that pension contributory fund was normally distributed because the standard deviation value was less than the mean value. In like manner, it had a median of 3044991 with skewness and kurtosis of 0.417749 and 2.161420 respectively. The maximum pension contributory fund as at the period of this study was 7852569 which means that the pension contributory fund was not more than 7852569, while the minimum pension contributory fund was 192714.9. In similar vein, pension investment showed mean value of 4295366 and standard deviation of 2856979. This means that pension investment was normally distributed because there was a wide gap between the mean and standard deviation. Also, the median value was 3949082 with its skewness and kurtosis as 0.367495 and 2.081475 respectively. The maximum pension investment as at the period of this study was 10218053 which means that the pension investment was not more than 10218053 while the minimum pension investment was 218319.1.

Table 2: Unit Root Test

Variables	Adj. T-Statistic	Prob. Values	Order of Integration
MCAP	-5.524224	0.0000	I(1)
PCF	-8.604787	0.0000	I(1)
PI	-8.331511	0.0000	I(1)

Source: Researcher's Computation 2020.

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To examine the existence of stochastic non-stationarity in the series, the research establishes the order of integration of individual time series through the unit root tests. The test of the stationarity of the variables adopted was Augmented Dickey-Fuller test. The variables tested are MCAP, PCF and PI with results as presented in Table 2 above. From Table 2, it can be seen that MCAP, PCF and PI were found to be stationary at first difference, that is, at order I(1). The ADF test statistics are greater than their respective tabulated values and their p-values are all below the 0.05 significant level for this study. Since the variables were found stationary at first order I(1), the Johansen approach to co-integration is applied to determine the long run relationship among the variables.

Table 3: Johansen Cointegration Analysis

Date: 12/14/20 Time: 17:36				
Sample (adjusted): 3 48				
Included observations: 46 after adjustments				
Trend assumption: Linear deterministic trend				
Series: MCAP PCF PI				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.445918	43.63055	29.79707	0.0007
At most 1 *	0.220654	16.47021	15.49471	0.0356
At most 2 *	0.103044	5.002423	3.841466	0.0253
Trace test indicates 3 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.445918	27.16034	21.13162	0.0063
At most 1	0.220654	11.46778	14.26460	0.1323
At most 2 *	0.103044	5.002423	3.841466	0.0253
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: *Researcher's Computation 2020.*

The Trace test of Johansen cointegration shows that there is indication of cointegration at 0.05 significance level as shown in its Trace statistics of none (43.63055), At most 1 (16.47021) and At most 2 (5.002423) are greater than their respective 0.05 critical value (29.79707), (15.49471) and (3.841466) while the p-values (0.0007), (0.0356) and (0.0253) are below the 0.05 level of significance for this study. Also, the maximum Eigenvalue test of Johansen cointegration shows that there is indication of cointegration at 0.05 significance level as shown in its Max-Eigen statistics of none and At most 2 (27.16034 and 5.002423 respectively) which are greater than their respective 0.05 critical value (21.13162 and 3.841466 respectively), while its p-values (0.0063 and 0.0253 respectively) are below the 0.05 level of significance for this study. Since there is cointegration in the two criteria of Johansen cointegration test, it implies that there is long

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run relationship between market capitalization, pension contributory fund and pension investment. This suggests the use of Vector Error Correction model.

Table 4: Vector Error Correction Model

Standard errors in () & t-statistics in []			
Cointegrating Eq:	CointEq1		
MCAP(-1)	1.000000		
PCF(-1)	0.013913		
	(0.00786)		
	[1.77013]		
PI(-1)	-0.011616		
	(0.00589)		
	[-1.97182]		
C	-5142.081		
Error Correction:	D(MCAP)	D(CONF)	D(TOTI)
CointEq1	-0.298845	-43.72668	-52.76644
	(0.08681)	(17.6721)	(17.6901)
	[-3.44268]	[-2.47433]	[-2.98283]
D(MCAP(-1))	0.267794	19.99488	46.11579
	(0.16346)	(33.2769)	(33.3107)
	[1.63832]	[0.60086]	[1.38441]
D(MCAP(-2))	0.114666	10.11071	-7.761404
	(0.15142)	(30.8270)	(30.8582)
	[0.75726]	[0.32798]	[-0.25152]
D(PCF(-1))	0.001682	-0.111593	0.566360
	(0.00139)	(0.28392)	(0.28421)
	[1.20593]	[-0.39304]	[1.99274]
D(PCF(-2))	0.001827	-0.368840	0.408191
	(0.00123)	(0.25100)	(0.25126)
	[1.48205]	[-1.46947]	[1.62460]
D(PI(-1))	-0.001923	-0.216402	-0.929213
	(0.00155)	(0.31529)	(0.31561)
	[-1.24183]	[-0.68636]	[-2.94419]
D(PI(-2))	-0.002671	0.250735	-0.465082
	(0.00139)	(0.28292)	(0.28320)
	[-1.92202]	[0.88625]	[-1.64222]
C	440.6004	233000.4	348380.6
	(338.506)	(68913.9)	(68983.8)
	[1.30160]	[3.38104]	[5.05018]
R-squared	0.299551	0.327789	0.264584
Adj. R-squared	0.167033	0.200614	0.125451
Sum sq. resids	47023813	1.95E+12	1.95E+12
S.E. equation	1127.348	229508.0	229740.8
F-statistic	2.260462	2.577466	1.901666
Log likelihood	-375.6910	-614.9142	-614.9598
Akaike AIC	17.05293	27.68507	27.68710
Schwarz SC	17.37412	28.00626	28.00829
Mean dependent	69.36600	166389.7	218057.6
S.D. dependent	1235.220	256696.3	245666.6
Determinant resid covariance (dof adj.)		8.67E+26	
Determinant resid covariance		4.82E+26	
Log likelihood		-1573.960	

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Akaike information criterion	71.15377	
Schwarz criterion	72.23776	
Number of coefficients	27	

Source: *Researcher's Computation 2020.*

The error correction term equation which shows the cointegrating relationship between variables, signifies long run effect. This is indicated by the pension investment t-statistics of 1.97182 which is above 1.96, establishing the long run relationship between pension investment and market capitalization. The previous year's deviation from long run equilibrium is corrected in the current period at an adjustment speed of 29.9%. The average change in PCF is associated with a 0.002% at lag 1 and lag 2 increase in MCAP on average ceteri paribus in the short run. While the average change in PI is associated with a 0.002% at lag 1 and 0.003% at lag 2 increase in MCAP on average ceteris-paribus in the short run.

Post Estimation Analysis

Post Estimation Test	
Serial Correlation: Probability Chi-Square	0.3196 10.39258
Heteroskedasticity: Probability Chi-Square	0.6693 77.81084
Normality Test: Probability Chi-Square	0.6026 4.550705

Source: Researchers' Computation 2020

The table above analyzed the Serial correlation, Heteroskedasticity and Normality Test. VEC Residual Serial Correlation LM was used to test for the presence of autocorrelation. The chi-square and the F-statistics showed that there is no problem of autocorrelation among the variables. VEC Residual heteroskedasticity was used to test for the presence of heteroskedasticity and homoskedasticity. The chi-square and the F-statistics showed no presence of heteroskedasticity and also determined the relationship between the variables. The table also test for normality using Jarque-Bera, the chi-square and the F-statistics showed that the data is normally distributed. From all these analyses it could be seen that there was long run relationship amongst variables indicating that PCF and PI all have long run effect on MCAP. This is in line with the findings of Enache, Milos and Milos (2015) even though they said there is lower magnitude long term impact of pension funds on market capitalization.

5. CONCLUSION AND RECOMMENDATIONS

Based on the findings of this research, the study concludes that pension funds have significant effect on capital market development. This means that the pension funds invested in the capital market affect the development of the capital market in Nigeria. Similarly, pension contributory funds only have an indirect significant effect on the capital market development through the pension funds invested in the capital. This implies that it is not just contributing the money by member of the contributory funds but the investment in securities within the capital market that brings about development of the capital market.

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Thus, it is recommended that government through its policy making should encourage more investment of the fallow pension funds into lucrative securities in the capital market. This will enhance the development of the capital market and further develop the financial sector which will in turn translate to the growth and development of the economy. Furthermore, voluntary contributions into the pension funds should be encouraged so as to the funds that will be available for investment in the capital market.

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Appendix

Quarterly Data on Pension investment, Pension contributory fund and Market capitalization from 2008 to 2019

YEAR	QUARTER	PENSION INVESTMENT	PENSION CONTRIBUTORY FUND	MCAP
2008	Q1	218,319.05	192,714.93	12,125.90
	Q2	358,998.84	323,625.86	10,920.32
	Q3	405,461.18	365,033.00	9,836.91
	Q4	471,769.79	406,112.49	6,957.45
2009	Q1	523,032.42	449,409.13	4,483.50
	Q2	592,348.81	488,282.86	5,986.30
	Q3	684,203.37	533,773.22	5,130.25
	Q4	747,049.40	579,561.87	4,989.39
2010	Q1	1,681,510.78	1,442,031.55	6,280.60
	Q2	1,777,578.22	1,460,425.87	6,174.42
	Q3	1,836,010.54	1,569,835.35	5,648.28
	Q4	2,030,200.50	1,487,905.90	7,913.75
2011	Q1	2,084,869.00	1,534,088.70	7,866.70
	Q2	2,251,539.90	1,940,325.90	7,987.10
	Q3	2,243,445.50	1,788,429.30	6,496.70
	Q4	2,450,381.00	1,937,680.40	6,532.60
2012	Q1	2,554,549.00	1,922,673.20	6,549.84

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	Q2	2,738,935.80	2,196,983.90	6,895.29
	Q3	2,936,838.06	2,022,647.59	8,282.28
	Q4	3,150,089.60	2,053,651.10	8,974.45
2013	Q1	3,382,420.03	2,711,028.71	10,733.29
	Q2	3,521,911.16	2,742,939.62	11,426.25
	Q3	3,704,871.51	2,382,754.31	11,652.87
	Q4	4,058,087.31	3,129,466.42	13,226.00
2014	Q1	4,207,628.97	3,304,563.79	12,445.69
	Q2	4,419,122.94	3,358,157.94	14,027.71
	Q3	4,591,925.80	3,449,028.80	13,607.40
	Q4	3,840,077.06	2,960,515.20	11,477.66
2015	Q1	4,802,912.97	3,637,732.70	10,717.53
	Q2	4,937,681.61	3,716,719.27	11,421.02
	Q3	5,112,982.71	3,860,442.15	10,728.90
	Q4	5,302,879.35	4,046,709.25	9,850.61
2016	Q1	5,462,925.04	4,020,425.01	8,704.87
	Q2	5,729,316.10	4,115,192.98	9,789.12
	Q3	5,961,561.16	4,517,665.88	9,733.37
	Q4	6,158,947.83	4,599,132.96	9,246.92
2017	Q1	6,415,506.86	4,823,384.18	8,828.96
	Q2	6,832,877.81	5,094,785.29	11,452.12
	Q3	7,164,598.10	5,396,423.41	12,216.93
	Q4	7,515,351.41	5,678,338.03	13,609.47
2018	Q1	7,943,507.83	6,000,869.61	14,992.96
	Q2	8,232,287.92	6,197,607.42	13,866.42
	Q3	8,345,712.33	6,315,882.81	11,962.26
	Q4	8,637,736.19	6,582,328.40	11,720.72
2019	Q1	9,030,803.35	6,883,059.02	11,672.10
	Q2	9,325,711.20	7,126,906.27	13,205.54
	Q3	9,583,029.82	7,392,381.40	13,450.44
	Q4	10,218,053.05	7,852,568.79	12,958.38