



(REVIEW ARTICLE)



Effect of Inflation on Pension Fund Investment in Federal Government Securities in Nigeria

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Abstract

This study investigated the effect of inflation on pension fund investment in federal government securities in Nigeria utilizing time series data spanning from 2007 to 2019. *Ex-post facto* was the research design used in the study. Secondary data for the period were collected from the National Pension Commission Annual Reports and Central Bank of Nigeria Statistical Bulletin. Data collected were analyzed and tested for unit root, using the Augmented Dickey-Fuller test. While Ordinary Least Square (OLS) estimation technique was used to test the hypothesis. The result revealed that inflation rate did not significantly impact on pension fund investment in federal Government Securities in Nigeria. This result implies that pension funds invested in federal government Securities yield adequate return on investment capable of withstanding the adverse effect of rising rate of inflation in Nigeria. This could be that, the volumes of monthly pension contributions channeled into Federal Government Securities actually cover the effect of inflation on pension fund investment in federal government securities in Nigeria. Based on the findings of the study, it was concluded that inflation did not significantly impact on pension fund investment in federal government securities in Nigeria. In line with the findings of the study, it was recommended that Nigerian Pension Industry should continue to advocate that policy makers target reduction in the monetary policy rate and also stabilize the value of Naira in order to enhance actual value of pension benefits in the long run. Also, the National Pension Commission should differentiate the monthly contributions that come into the pension fund investment in the annual report so as to determine the actual return on investment of various securities where pension fund is invested.

Keywords: Inflation; Pension Fund; Investment; Government Securities

1. Introduction

Nigeria embarked on a major pension reform in 2004 as a consequence of various problems inherent in the previous pension scheme (defined benefit scheme) that existed in both the public and the private sectors. The public sector operated the pay-as-you-go (PAYG) scheme, which became unsustainable due to inadequate budget provisions and low funding [16]. This was exacerbated by increases in workers' salaries and emoluments and other attendant demographic shifts due to rising life expectancies that tended to elongate the pension obligations of the employers of labour. The consequence of the foregoing was the huge pension liabilities accumulated by the public sector. In the private sector, many employees were not covered by any form of pension scheme while most of those that were covered had their schemes underfunded. Indeed, those private sector schemes which hitherto existed were characterized by largely unregulated arrangements and were unwieldy as there were as many schemes as the number of employers. As a result, there was low compliance ratio which was further compounded by the absence of regulation and supervision by a government agency. However, with the advent of the Pension Reform of 2014, Nigerian pension industry witnessed improved developments.

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One of such improvement is the accumulation of large capital. In 2007 the industry generated N815 billion. The following year it rose to N1, 098 trillion. 2009 had the fund at N1, 529 trillion. It has been upwardly mobile since then. The pension fund stood at ₦10.215 trillion as at 31 December 2019 [20]. This large accumulation of fund makes the pension industry to be among the major institutional investor that influences the economy. Section 85 of Pension Reform Act 2014 requires the pension fund managers to invest part of the contributions it receives in Federal Government Securities.

In 2007, 2008, 2009 and 2010 analyses of the industry's portfolios reveal that investments in FGN securities accounted for 34.33%, 31.91%, 32.61% and 40.9% respectively. From 2011 to 2015 pension fund investment in Federal Government Securities increased from 55.56% to 67%. In 2016, investments were predominantly in Federal Government Securities, which accounted for 72% of total pension fund assets. This was a 5% increase from 67% recorded in 2015 and could be attributed to the high yields on these instruments, especially in Q2:2016 and Q3:2016 [18]. In 2017, pension fund investment in Federal Government Securities accounted for 70%. The industry experienced a slight reduction from the 72 percent allocation as at 31 December, 2016. The reduction resulted from the maturity of 2 FGN Agency Bonds (Local Contractors SPV and Federal Mortgage Bank); increased investments in money market instruments due to attractive deposit rates; increased investments in alternative assets such as (infrastructure bonds and funds); and appreciation in the market values of quoted equities during the year [19]. In 2018 pension fund investment in Federal Government Securities increased to 73% and later dropped to 72% in 2019.

The biggest uncertainty however, is how well the pension funds invested in Federal Government Securities will yield good return on investment. This is because pension is subject to the vagaries of macroeconomic variables. A macroeconomic variable that has consistently played out in the Nigerian economy is inflation. This is the rate of increase in prices over a given period of time. Inflation is typically a broad measure, such as the overall increase in prices or the increase in the cost of living in a country [4]. Inflation represents how much more expensive the relevant set of goods and/or services has become over a certain period, most commonly a year. It is believed that while high inflation is bad for an economy because of its adverse effect on economic performance, zero inflation is equally harmful because it will lead to eventual stagnation of the economy since its presence at a mild level is needed for economic growth.

Consistent rise in inflation as experienced in the Nigeria economy could overlap the returns provided by pension fund investment in Federal Government Securities. This might lead to a reduction in buying power of the investment fund or lesser return than anticipated. Considering the rate of growth of inflation and its adverse effect in Nigeria recently, investment in low return securities like Federal Government Securities will actually affect the interest of retirees and stake holders. Consequently, Federal Government Securities are the most prone to inflation risk due to low return on investment. It is very important to monitor that the existing or selected Federal Government instruments are offering higher return rate than the potential future inflation rate. It is against this background that this study seeks to investigate Effect of Inflation on Pension Fund Investment in Federal Government Securities in Nigeria.

2. Review of related literature

2.1. Conceptual Review

2.1.1. Inflation

Inflation is a general rise in the price level in an area over a certain period of time. It is the decline of purchasing power of a given currency over time. A quantitative estimate of the rate at which the decline in purchasing power occurs can be reflected in the increase of an average price level of a basket of selected goods and services in an economy over some period of time. The rise in the general level of prices, often expressed as a percentage, means that a unit of currency effectively buys less than it did in prior period [7].

Inflation is one of the most frequently used terms in economic discussions, yet the concept is variously misconstrued. There are various schools of thought on inflation, but there is a consensus among economists that inflation is a continuous rise in prices. Simply put, inflation depicts an economic situation where there is a general rise in the prices of goods and services, continuously. It could be defined as 'a continuing rise in prices as measured by an index such as the consumer price index (CPI) or by the implicit price deflator for Gross National Product (GNP)'. Inflation is frequently described as a state where "too much money is chasing too few goods". When there is inflation, the currency loses purchasing power [27]. The purchasing power of a given amount of naira will be lesser over time when there is inflation in the economy. For example, if N20.00 can purchase 10 shoes in the current period, if the price of shoes doubles in the next period, the same N20.00 can only afford 5 shoes. Fernando (2021) reveals that as a currency loses value, prices rise and it buys fewer goods and services. This loss of purchasing power impacts the general cost of living for the

common public which ultimately leads to a deceleration in economic growth. The consensus view among economists is that sustained inflation occurs when a nation's money supply growth outpaces economic growth.

The impact of inflation may seem small in the short term, but over the course of years and decades, inflation can drastically erode the purchasing power of savings. Inflation can become a destructive force in an economy, however, when it is allowed to get out of hand and rise dramatically. Unchecked inflation can topple a country's economy, like in 2018 when Venezuela's inflation rate hit over 1,000,000% a month, causing the economy to collapse and forcing countless citizens to flee the country [25].

Inflation is a problem that threatens all economies because of its undesirable effects [27]. This is because a high level of inflation disrupts the smooth functioning of a market economy in [27]. It imposes welfare costs on the society; impedes efficient resource allocation by obscuring the signaling role of relative price changes; discourages savings and investment by creating uncertainty about future prices; inhibits financial development by making intermediation more costly; hits the poor excessively, because they do not hold financial assets that provide a hedge against inflation; and reduces a country's international competitiveness by making its exports relatively more expensive, thus impacting negatively on the balance of payments, and perhaps more importantly, reduces long-term economic growth.

Doguwa (2014) observes that high and sustained output growth in conjunction with low inflation is the common objective of macroeconomic policy all over the world. But can they coexist? Could there be a trade-off between lowering inflation and achieving sustained and higher growth? At the operational level, there is recognition that inflation-growth nexus depends on the level of inflation ostensibly because, at some low levels inflation may be positively correlated with output growth, but at higher levels inflation is likely to be inimical to growth. According to Olu and Idih (2015) when inflation is above single digits level and remain spiral, investors are hesitant to invest and this affects the future growth outcome of the country. Although inflation is generally harmful to an economy - a hyperinflation can destroy an economy and has in the past - it is not true that inflation harms every player in the economy. Although inflation can destroy wealth and income, inflation also has the pernicious effect of redistributing wealth and income, and doing so unfairly.

2.2. Causes of Inflation

When inflation occurs, it leads to higher prices for basic necessities such as food; it can have a negative impact on society. Inflation can occur in nearly any product or service. Once inflation becomes prevalent throughout an economy, the expectation of further inflation becomes an overriding concern in the consciousness of consumers and businesses alike. Amadeo (2021) states that there are two main causes of inflation: Demand-pull and Cost-push. Both are responsible for a general rise in prices in an economy. But they work differently. Demand-pull conditions occur when demand from consumers pulls prices up. Cost-push occurs when supply cost force prices higher.

(Pettinger, 2019) states that the main causes of inflation are either excess Aggregate Demand (AD) (economic growth too fast) or cost push factors (supply-side factors). He went further to summarize the main causes of inflation as follows:

- Demand pull inflation, which is aggregate demand growing faster than aggregate supply (growth too rapid)
- Cost push inflation: For example, higher oil prices feeding through into higher costs.
- Devaluation: increasing cost of imported goods, and also the boost to domestic demand.
- Rising wages: higher wages increase firms' costs and increase consumers' disposable income to spend more.
- Expectations of inflation: causes workers to demand wage increases and firms to push up prices.

2.3. Pension fund

Pension fund is a fund set aside by employer or employee or both, which accumulates huge capital that is paid out as a pension for employees when they retire from active service. Fapohunda, (2013) states that pension fund is simply the amount set aside either by an employer or an employee or both to ensure that at retirement, there is something for employees to fall back on as income. Pension funds are investment pools that pay for workers' retirements. Funds are paid for by either employees, employers, or both. Corporations and all levels of government provide pensions [10]. Pension funds typically aggregate large sums of money to be invested into the capital market, such as stock and bond markets, to generate profit (returns). A pension fund represents an institutional investor and invests large pools of money into private and public companies. Pension funds are typically managed by companies (employers). The main goal of a pension fund is to ensure there will be enough money to cover the pensions of employees after their retirement in the future.

The primary objective of setting up a pension fund is to provide employees who have reached retirement age with income in the form of a lifetime pension or capital. Unlike the pay-as-you-go basis, pension funds are managed by

capitalization [1]. Pension funds typically aggregate large sums of money to be invested into the capital market, such as stock and bond markets, to generate profit (returns). Pension funds are typically managed by companies. The main goal of a pension fund is to ensure there will be enough money to cover the pensions of employees when they retire from active service in the future.

Pension funds companies are the largest investment blocks in most countries and dominate the stock market where they invest. When managed by professional fund managers, they constitute the institutional investor category with insurance companies and investment trusts. Commonly, pension funds are exempt from capital gains tax and the earnings on their investment portfolios are either tax deferred or tax exempt.

Pension companies as mobilizers of long-term funds play significant role in this process. The Organization for Economic, Corporation and Development OECD (2009) identifies the pension industry as a credible source of continuous supply of long-term funds. OECD (2009) observes that institutional investors, in particular pension funds, mutual funds and insurance have enhanced their role as collectors of savings over the past few decades. It went on to conclude that this trend is likely to continue as retirement saving grows and the increased pension saving will augment the size of capital markets. Fund raised from pension are not allowed to be idle, rather they are invested. Pension fund investments increase the availability of long-term funds, enhance competition, induce financial innovation, and improve corporate governance.

2.4. Federal Government's Securities

Federal Government's securities are bond or other types of debt instrument that are issued by a government with a promise of repayment upon the security's maturity date. Federal Government securities are typically regarded as low-risk investments because they are backed by the taxing power of a government. Government securities are debt instruments issued by the Government in exchange for money borrowed from the public, with a promise of repayment upon maturity. There are two types of Government securities commonly traded, these are treasury bonds (T-bonds) and treasury bills (T-bills). T-bonds consist of long-term securities that mature over a year whilst T-bills mature in less than a year. Investment in treasury securities in developed countries is probably the safest investment that can be made [11].

Federal Government securities are always issued for two different reasons. The most important reason Federal Government issue securities are to raise funds for government expenditures. The federal government issues treasury securities to cover deficits (under-budget) in its annual budget. Moreover, countries will often issue bonds for construction of schools, libraries, stadiums, and other public infrastructure programs. Some develop countries will sell debt securities to control the supply of money in an economy. If the Federal Reserve wants to slow the growth rate of money in the economy, it will sell government securities. This means that it is sucking up currency from the economy and replacing them with government securities, which results in a slowing of the rate of growth in the money supply. Slowing the rate of money's growth in an economy will help keep inflation under control.

In most countries, bonds and equities remained the two main asset classes in which pension assets are invested, accounting for more than half of investments in 32 out of 36 OECD countries, and in the five reporting non-OECD G20 jurisdictions. The combined proportion of bonds and equities was the highest (relatively to the size of the portfolio) in Chile (99.4%), Estonia (96.7%) and Mexico (96.3%). Pension assets may be invested in these instruments either directly or indirectly through collective investment schemes. For some countries, the look-through of the investments of collective investment schemes was not available, such as for Sweden (in which 63.4% of assets were invested) and the United Kingdom (26.6% of investments). Only the direct investments in bonds and equities were known for these countries (e.g. 30% for Sweden, 39.2% for the United Kingdom). The overall exposure of pension assets to fixed income securities and equities was probably higher in these countries [14].

Contributory pension Scheme accumulates capital for long-term investment. Federal Government always raises money from this fund for government expenditures. In fact in Nigeria, more than 70 per cent (70%) of pension fund asset are invested in Federal Government securities. FGN Bonds and Treasury Bills accounted for 58.75% of pension fund assets, but by February 2017, allocation to FGN Bonds and Treasury bills has increased to 72.36%, an increase of 13.61% [19]. Popoola (2019) stated the total pension assets under the Contributory Pension Scheme rose to N8.49tn as of the end of November 2018 and the pension commission revealed that 72.5 per cent of the fund had been borrowed by the Federal Government and invested in the FGN securities totaling N6.16tn during the period under review.

The National Pension Commission (PenCom) disclosed that the total pension assets in the country have risen to N10.251 trillion as at December 31, 2019. The commission which disclosed this in publication obtained on its website, said these

assets have been judiciously and prudently invested in up to 20 major asset classes to yield interests to the contributors. Giving a breakdown of how the assets were invested, the commission said federal government's securities took a lion-share of the investment as it received N7.345 trillion, representing 71.65 per cent of the total assets. [20].

Penop (2018) reveals that the investment of pension fund in Federal and States governments' securities has assisted these governments to cost-effectively manage their national debts, thereby contributing in the solving of their financial needs and contributing to the stability in the market of government debts. 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 outside capital for the financing of their businesses. The Fund is getting into real estate, infrastructure and mutual fund. The fund therefore provides a domestic source of borrowing, which doesn't attract excessive high interest rate. The transfer of resources in favour of long term assets by the fund has significantly impacted on the nation's GDP growth rate. Nigerian pension industry contributes significantly to capital accumulation in Nigerian economy. This avails various sectors of the economy with more capital. However, inflation can counter the benefits the economy would derive from having more investment. When there is inflation, the currency loses purchasing power. This reduces the extent of gain that would be derived from the resources made available by the investment of the pension industry.

2.5. Empirical Review

Njoku and Osu (2019) investigated the effect of inflation on the optimal investment strategies for Defined Contribution Pension. The Hamilton-Jacobi-Bellman (H-J-B) equation, Legendre transformation, and dual theory were used to obtain the explicit solution of the optimal investment strategies for CRRA utility function. The investigation reveals that inflation has significant negative effect on optimal investment strategy, particularly; the CCRA is not constant with the investment strategy since the inflation parameters and coefficient of CRRA utility function have insignificant input on the investment strategy.

Garcia and Rocha da Silva (2019) assessed pension expenditure determinants – the case of Portugal. This study disentangled the impact of demographic and economic variables, such as ageing, productivity, and unemployment, on pension expenditure. Using Portuguese time-series data, from 1975 to 2014, statistical evidence was found of co-integration between unemployed people aged between 15 and 64 years old, apparent productivity of labour, the old-age dependence index and pension expenditure as a share of gross domestic product. The use of a vector error correction model, with impulse-response functions and variance decomposition, showed that ageing has an almost insignificant impact in the long-run, when compared with unemployment and productivity.

Ofori-Abebrese, Pickson and Abubakari (2017) assessed the impact of macroeconomic variables on pension benefits in Ghana: A case of Social Security and National Insurance Trust. The Auto-regressive Distributed Lag Model was utilized to examine the long run and short run dynamics of some major economic indicators and pension benefits. The empirical evidence indicated that inflation deteriorates total pension benefits. Increasing monetary policy rate and depreciation of the domestic currency should be an issue to contend with only in the short run rather than in the long run. The study also found the prominence of the implementation of the National Pension Reform in 2008. The study concluded that if policy makers target the reduction in the monetary policy rate and the appreciation of the domestic currency in an effort to stabilise the value of total pension benefits in the long run, it would not be effective in the long run because of their insignificant nature. Policy makers should rather target inflation as the prime tool for stabilizing the standard of living of retirees in the long run.

Estrada, Khan, Staniewski and Mansor (2017) explored how inflation and the exchange rate can affect the real value of any pension plan system in the long run. The study focus on the specific pension plan system of the Employees Provident Fund (EPF). The study used a new model that is entitled "The EPF Real Value Box – EPFRV Box". The EPFRV Box facilitates the graphical visualization of the inflation/exchange rate impact on the Employees Provident Fund (EPF). In essence, the EPFRV Box is applied to the Employees Provident Fund (EPF) of Malaysia to evaluate the impact of inflation and exchange rates on the Malaysian EPF real value from 1980 to 2030. Finally, the main objective is to apply the EPFRV Box to extend the significance of the impact of inflation and the exchange rate on any pension plan system (in this case EPF) beyond mere theory, using them as practical instruments to solve retirement and pensioner problems.

Boateng (2015) evaluated the performance of Social Security and National Insurance Trust (SSNIT) investments returns from 2004 to 2013. The Evaluative research design was adopted and the results showed that the returns on SSNIT investment were generally below the general market returns (Ghana Stock Exchange) on absolute basis. The effect of inflation on the returns of the fund was significant with the fund recording negative real return in some years. It was also found that inadequate investment expertise at SSNIT may have contributed to the low returns recorded by the

organization. However, further measure of performance on risk-adjusted basis using the three widely used indexes (Jensen alpha, Sharpe ratio and Treynor index) revealed that, SSNIT portfolio manager outperformed the market. Again, SSNIT portfolio was found to be less risky than the market. It was also found that Investment Monitoring Capacity, Industry and regulatory challenges, Currency risks, Silence of the pension law on foreign investments, Political interference and others are some of the challenges encountered in the investment of SSNIT funds.

Echekoba, Adigwe and Amakor (2015) examined inflation and growth in developing countries especially in Nigeria with the view of ascertaining its effect on the Nigerian economy. It ascertained the relationship between inflation and economic growth as well as the inflationary effect and the means of controlling inflation on the Nigeria economic growth. The study covered the ten year period from 2002 to 2012 and adopted an *expos-facto* research design. The Ordinary Least Squares (OLS) regression techniques were used. The results show that inflation has a negative effect on exchange rate, consumer price index (CPI) and economic growth in Nigeria. But there exist a positive relationship between inflation and gross domestic product (GDP).

Ezugwu and Itodo (2014) analyzed the portfolio of pension funds investment by Pension Funds Administrators in Nigeria. Data generated were analyzed using multiple Regression and Covariance\Correlation Matrix. The result showed that equity which had the highest percent in the portfolio also returned the highest value of N2.8528bn. The consistent increase in return over an increase in the weight of the asset classes in the portfolio suggests a direct relationship between size of asset in a portfolio and its return. We therefore recommend that Capital Market Operators are enjoined to continuously scan the macro-economic environment and liaise with institutional investors, in order to develop investible products that will satisfy the risk-reward profile of institutional investors. We also call for increased Investors' confidence; there is need for high corporate governance practices, market discipline and strict enforcement of rules in the capital market. The National Pension Commission will continue to partner with relevant stakeholders, make its Investment Regulation more flexible and encourage increased pension fund investments in order to further develop and deepen the Nigerian capital market.

Onwe and Olarenwaju (2014) assessed the adverse effects of inflationary pressures on corporate investment, with special emphasis on the West-African monetary zone (WAMZ). The study aimed at unfolding the short-and long-run effects of inflation on corporate investment. Error Correction Mechanism (ECM) in the analysis of factors affecting the rate of corporate investments in selected countries. The analytical model followed the Cobb-Douglas production principles, and the analytical results were summarized as follows: first, a long-run positive relationship exists between inflation and corporate investment and a short-run negative relationship between inflation and corporate investment; secondly, the short-run dynamics of the economic environment in the WAMZ indicated that real rates of interest, government spending, and relative prices of capital goods are statistically insignificant in determining the level and rate of corporate investment in the selected countries within the West-African monetary zone; third, economic growth does not have significant rates in the West-African monetary zone appear to be associated with economic impacts that are contrary to theoretical expectations.

Wanjiku (2012) studied the effect of macroeconomic variables on portfolio returns of the pension industry in Kenya. Analysis of Variance (ANOVA) was used as analysis technique. The study established that pension funds' industry return was heavily influenced by the selected macroeconomic variables with exchange rate having the largest influence and interest rates having the least impact. The computed R² was established to be of 0.533 which shows there is a positive and strong correlation between the selected variables and industry returns. When expressed as a percentage, 53.3% of industry returns is influenced by the variables while 46.7% or (100% - 53.3%) shows industry returns affected by other variables not included in the regression, more specifically the error term. The findings established that exchange rates, inflation rates and interest rates have an inverse relationship with pension funds' returns, with GDP growth having a direct relationship. Therefore the findings of the study lends credence and confirms the researcher's theory that the performance of the pension fund industry is affected by fundamental macroeconomic factors such as GDP growth, inflation, currency exchange rate and interest rates. The aforementioned macroeconomic variables should be closely monitored and taken into account by pension funds' stakeholders and fund managers while drawing up the investment policy statement and making investment decisions since they have an effect on the overall performance of industry returns.

3. Methodology

3.1. Research design

The research employed *ex-post facto* research design to carry out this study. It is a form of study in which data used were already collected and organized before the study began.

3.2. Nature and source of data

Secondary data were used in the study. Secondary data refer to data that are already collected and organized for immediate use. Data were taken from the annual reports of National Pension Commission and Central Bank of Nigeria Statistical Bulletin of various years.

3.3. Model specification

The model used in this study was based on Gathimba (2017) whose model is stated as:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \varepsilon \dots\dots\dots (1)$$

Where:

- Y – Pension Fund Assets (Dependent variable)
- X1- Equity Growth
- X2- Interest Rate
- X3- Inflation Rate
- β_0 - Is the constant of the model
- β_1 - β_3 – Are the regression coefficients
- ε – Stochastic error term estimate

Modification was made to the variables in the model above to suit the hypothesis of this study. Thereby, the functional relation of model of used in this study is given as:

$$PINVFGS = f(INF) \dots\dots\dots (2)$$

The linear function is stated as:

$$PINVFGS = \beta_0 + \beta_1INF + \mu \dots\dots\dots (3)$$

Where

- PINFGS = Pension industry investment in federal government securities
- INF = Inflation rate
- β_0 = constant parameter
- β_1 = coefficient of INF
- μ = error term

3.4. Unit root test

Table 1 Result of unit root test

Variable	Phillips-Perron test statistic	Test critical values	P-value	Order of integration
FGS	-6.771689	-3.212696	0.0004	1(2)
INF	-6.091684	-3.175352	0.0007	1(1)
MPR	-4.783426	-3.175352	0.0042	1(1)

Source: Researcher’s calculation using Eviews 10 and data in Appendix one

The results of the tests as reported show that at first difference the variable inflation and monetary policy rate were stationary. On the other hand the variable pension industry investment in federal government securities was stationary at second difference.

3.5. Descriptive Statistics

Table 2 Result of Descriptive Statistics

	FGS	INF	MPR
Mean	12.23378	1.047881	1.038643
Median	12.24839	1.071882	1.079181
Maximum	12.86601	1.269513	1.146128
Minimum	11.44668	0.819544	0.778151
Std. Dev.	0.468767	0.125485	0.124713
Skewness	-0.334336	-0.102459	-1.216654
Kurtosis	1.937277	2.442708	3.212785
Jarque-Bera	0.853938	0.190973	3.231727
Probability	0.652484	0.908931	0.198719
Sum	159.0392	13.62245	13.50236
Sum Sq. Dev.	2.636915	0.188957	0.186639
Observations	13	13	13

Source: Researcher's calculation using Eviews 10 and data in Appendix one

The mean of the distribution measures aggregating tendency of the data. The mean of FGS, INF and MPR are 12.23378, 1.047881 and 1.038643 respectively. Standard deviations of the variables are checked against their respective means. The standard deviations of FGS, INF and MPR are 0.468767, 0.125485 and 0.124713 respectively. Against their respective means all variables are lower. This shows that the volatility of each variable is low. The skewness estimate for each variable shows that all are negatively skewed. This suggests that probability distribution of the variables means have tails to the left of the distribution.

3.6. Hypothesis Test

The intercept value implies that if each index for inflation and monetary policy rate are held constant pension industry investment in federal government securities will increase by 0.6040711 basis points. The coefficient of inflation at 0.056941 shows it has a positive relationship with pension industry investment in federal government securities. It implies that every 5.6941 percent change in inflation brings about a percent increase in pension industry investment in federal government securities. On the other hand, the coefficient of monetary policy rate at -0.139875 shows it has a negative relationship with pension industry investment in federal government securities. It shows that every 13.9875 percent change in monetary policy rate brings about a percent decrease in pension industry investment in federal government securities. An Adjusted R-squared of 0.973923 shows that in the model used inflation can explain only 97.3923 of the variations in pension industry investment in federal government securities. Given that p-value of inflation at 0.7696 is higher than the level of significance (0.05) it shows that there is no statistical significance. Therefore, it is concluded that inflation has no significant effect on pension industry investment in government securities.

The below analysis showed that inflation rate in the Nigerian economy has low influence on pension fund investment in federal government securities. This can be attributed to the low risk nature of federal government securities. The financial instrument is backed by the 'full faith and credit' of the Federal Government, and as such it is classified as a risk free debt instrument. They have no default risk, meaning that it is absolutely certain your interest and principal will be paid as and when due [28]. The implication of the result could also be that the monthly contributions that come into the pension fund investment in Federal Government Securities actually cover the effect of inflation on pension fund investment in federal government securities in Nigeria. The finding of hypothesis test agrees with Gathimba (2017) who found that inflation movements do not stop growth of pension fund assets. This may be attributed to the contributions to the pension funds, which keep increasing despite the rate of inflation in the country. It is increasing at a rate higher than the level of inflation in the country. As more persons are enrolling under the pension scheme across the country the volume of fund available to the pension industry keeps rising. Therefore the industry has much fund at its disposal

to invest notwithstanding the level of inflation. Wanjiku (2014) agrees having found that inflation rate has an inverse relationship with pension funds’ returns, with GDP growth having a direct relationship.

Table 3 Result of Hypothesis test

Dependent Variable: FGS				
Method: ARDL				
Date: 07/03/21Time: 13:08				
Sample (adjusted): 2 13				
Included observations: 12 after adjustments				
Maximum dependent lags: 4 (Automatic selection)				
Model selection method: Akaike info criterion (AIC)				
Dynamic regressors (4 lags, automatic):				
Fixed regressors: INF MPR C				
Number of models evaluated: 4				
Selected Model: ARDL(1)				
Note: final equation sample is larger than selection sample				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
FGS(-1)	0.967117	0.075409	12.82501	0.0000
INF	0.056941	0.187923	0.303001	0.7696
MPR	-0.139875	0.262016	-0.533843	0.6080
C	0.604071	0.758566	0.796333	0.4488
R-squared	0.981035	Mean dependent var		12.29938
Adjusted R-squared	0.973923	S.D. dependent var		0.422734
S.E. of regression	0.068265	Akaike info criterion		-2.269628
Sum squared resid	0.037281	Schwarz criterion		-2.107992
Log likelihood	17.61777	Hannan-Quinn criter.		-2.329471
F-statistic	137.9401	Durbin-Watson stat		2.050337
Prob(F-statistic)	0.000000			

*Note: p-values and any subsequent tests do not account for model selection; Source: Researcher’s calculation using Eviews 10 and data in Appendix one

APPENDIX

Year	FGS	INF	MPR
2007	11.4467	0.81954	0.97772
2008	11.5451	1.17898	0.989
2009	11.698	1.07918	0.77815
2010	11.9187	1.07188	0.79588
2011	12.1345	1.01284	1.07918
2012	12.2484	1.07918	1.07918
2013	12.2405	0.90309	1.07918
2014	12.3799	0.90309	1.11394
2015	12.4859	0.98227	1.04139

2016	12.5518	1.26951	1.14613
2017	12.7237	1.18752	1.14613
2018	12.8002	1.0569	1.14613
2019	12.866	1.07846	1.13033

4. Conclusion

The pension industry is a credible source of continuous supply of long-term funds. The Contributory pension system in place in Nigeria allows pension industry to accumulate assets, which are invested in different securities. Federal Government Securities is the major area where pension funds are invested regularly. This investment of the pension industry can be affected by a number of factors. One of such is inflation in the economy. Simply put, inflation depicts an economic situation where there is a general rise in the prices of goods and services, continuously. This situation can exert some influence on the activities of economic agents and the returns on their operations. In line with this premise this study assessed the impact of inflation on pension industry investment in Nigeria. Based on the findings of the study it was concluded that inflation did not significantly impact on Nigerian pension industry investment in Federal Government Securities.

Recommendations

In line with the findings of the study the following recommendations are made:

- The pension industry should continue to advocate that policy makers target the reduction in the monetary policy rate and also stabilize the value of Naira in order to enhance actual value of pension benefits in the long run.
- Investments of the pension fund should be effectively liberalized and diversified in order to shield the investments from negative impact of inflation.
- The National Pension Commission should differentiate the monthly pension contributions that come into the pension fund investment in the annual report so as to determine the actual return on investment of various securities where pension fund are invested.

Compliance with ethical standards

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There is no conflict of interest.

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