MACRO-ECONOMIC DETERMINANTS AND THE PERFORMANCE OF PENSION FUNDS IN NIGERIA

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Abstract
Macro-economic determinants which are the drivers of government economic policies in Nigeria are critical parameters in determining the success of an investment. Pension Administrators are institutional investors and their investment is sensitive to the trends of these macro-economic determinants which make decision-making difficult as new economic policies can change investments fortunes overnight! This study tests the impact of these macro-economic determinants on the performance of pension funds in Nigeria with the view of determining the consequences of their movements on the successful operation of Pension Funds Administrators. The study collected its data from secondary sources which include annual reports from National Pension Commission, Central Bank of Nigeria and Nigerian Stocks Exchange. Descriptive and inferential statistics form the basis of the data analysis and interpretation. The major findings of the study are that Treasury Bills Rates, General Inflation Rates and Deposit Money Banks Rates are significant drivers on Pension Investment Returns in Nigeria at 1% level. The major conclusion of this study is that government monetary policies along with other variables under consideration in this study have significant impact on the performance of Pension Administrators in Nigeria. The study, therefore, recommends among other things, that new economic policies by government that tailored the movements of macro-economic determinants which resulted in investment returns earning variations should always be critically examined before they were announced to avoid their adverse consequences especially on the investment fortunes earned. The study further recommends that a ‘special reserve fund’ should be established and funded to augment any loss of investment due to government new economic policies that gave birth to private sector new operating policies.

1. Introduction
Pension schemes, all over the world, have undergone remarkable transformations with the aim of achieving sustainability towards addressing prevailing economic realities. High cost of sustaining the old scheme and the rapid growth of retirees’ population are among the key issues that necessitated pension reform throughout the world. In 2004, Nigeria joined the rest of the world in this reform and introduced The New Pension Reform Act 2004 (PRA, 2004) which is in full operation today. Nigeria’s case in relation to old pension system is sympathetic because of decadence, bureaucratic inefficiencies and monumental corruption that set in and overwhelmingly rotten the whole system to a level almost beyond salvation (Ahmad, 2010).
From the inception of the pension system reform in 2004, the industry has been battling with quite a number of challenges ‘especially on pension funds investment’ (PenCom Report, 2009). One of the major problems was in ‘the need to ensure fair returns on pension fund investment in the face of generally low rates of interests on some financial instruments’ (PenCom Report, 2010).

History has it that the old pension system in Nigeria collapsed as a result of ineffective management of funds coupled with monumental corruption (Ahmad 2010). The new system appears to follow the trend of the old system if it does not respond to changes in ever changing Nigerian economic policies and adjustments of the operating policies of the private sector. These changes automatically reshaped the trends of some critical macro-economic variables that are indispensable to the new pension funds administrators’ management and investment decisions.

The major objectives, the new Act seeks to achieve, are to ensure that every retiree received his benefits as at when due, assist improvident individuals to save so as to carter for old age and establish uniform set of rules, regulation and standards for the payment of retirement benefits. In the same vein, Pension Funds Administrators (PFAs) were established to principally invest and manage pension funds and assets on behalf of pension funds contributors in accordance with the provisions of the act. The PFAs are expected to evaluate the quality of instruments in to which the pension funds may be invested in and to ensure the safety of pension funds having due regard to the risk rating of instruments being undertaken by a risk rating company registered under the Investment and Securities Act 1999.

There is a dearth of empirical evidences from the available literatures on the relationship between macro-economic variables and performance of pension funds in Nigeria. Most of the available literatures, to the best of the researcher’s knowledge, focus on how the management efficiency relate with their performance rather than how the performance relates with the macro-economic variables.

Instability in government economic policies, especially monetary policies, is one of the major impediments to the investment performance generally in Nigeria. Many unnecessary divestment and investment may not be unconnected with the ever changing economic policies in the country with or without a change of administration.

Diversification of investment is another impediment to the performance of investment in Nigeria. Ability of new Pension Fund Administration in Nigeria to effectively respond to changes in government economic policies will diversify away unsystematic risk from the investment. A low rate of interests of financial instruments, especially banking sector instruments, is another major impediment to the investment performance in Nigeria. PenCom reports of 2010 categorically stated that the new pension industry has been battling with quite a number of challenges ‘on pension funds investment especially on the need to ensure fair returns on investment in the face of generally low rates of interests on some financial instruments’.

It follows, therefore, that despite the stocks of literatures on the new pension schemes at local and international forums on how the new pension system will be sustained and how the management of the system will be efficient; there is little attention on the impact of macro-economic variables
on the performance of pension funds administrators particularly here in Nigeria. This is because the industry is still at its infancy.

In view of the above, it is pertinent at this point to understand that in the wave of global pension scheme transformation which resulted into increase in Asset Under Management (AUM) by pension funds managers with Nigerian Pension Fund Administrators holding more than two trillion naira belonging to pension contributors and representing more than half of the entire most recent budget (2010-2012) of the country then this appears to raised serious case of concern to all stakeholders because of the bitter experiences of the financial sector of the economy, particularly the banking sector.

It is worthy to note that if macro-economic variables which are statistics that indicate the current status of the economy depending on the area of concern or interest are effectively and efficiently factored in critical investment decisions by the Nigerian Pension Funds Administrators it can generate earnings growth, enhance financial depth and diversification of investors assets, increase market stability and efficiency, provide means of risk pooling for those with meagre contribution, enhance risk-return opportunities for end-investors and contribute to the development of long-term securities, better transparency and governance as well as the improvement of micro-structure and adoption of innovative financial products.

This study majorly seeks to empirically test the impact of various macro-economic variables under consideration in this study on the performance of Pension Funds Administrators in Nigeria.

The following specific objectives are set out below in order to achieve the major objective:

i. To determine the impact of Monetary policy rates on performance of Pension Funds in Nigeria.

ii. To ascertain the contribution of Treasury bills rates on performance of Pension Funds in Nigeria.

iii. To Evaluate the Effect of Money-Deposit banks rates on performance of Pension Funds in Nigeria.

iv. To investigate the influence of Equity capital investment growth rates on performance of Pension Funds in Nigeria.

Based on the objectives above, the following null hypotheses are formulated to test the impact of the following considered macro-economic variables on the performance of Pension Fund Administration in Nigeria.

i. Monetary policy rates have no significant impact on pension investment returns in Nigeria.

ii. Treasury bills rates have no significant impact on pension investment returns in Nigeria.

iii. Money-deposit banks’ rates have no significant impact on pension investment returns in Nigeria.

iv. Equity capital investment growth rates have no significant impact on pension investment returns in Nigeria.

To the best of our knowledge, this study is the first of its kind in Nigeria so far on the available pension literatures reviewed locally by the researcher to make an attempt to fill in this gap. Nigerian government at federal level and National Pension Commission will find this work highly
beneficial especially in formulating pension funds investment policies which will be a veritable input of formulating government economic policies.

2. Review of Related Literature

Macro-economic determinants are statistics that indicate the current status of an economy of a state depending on a particular area of the economy. They are published regularly at a certain time by governmental agencies and the private sectors of the economy. There are some professional expert in investment analysis that provides some insights on the possible fluctuations as a result of the dates of critical fundamental announcements and events. These macro-economic variables under consideration in this study when properly used before making investment can be invaluable resources for any investor individual or institutional.

In truth, these statistics help investors monitor the economy's pulse; thus it is not surprising that these are religiously followed by almost everyone in the financial markets. The degree of volatility is determined depending on the importance of an indicator. That is why it is important to understand which indicator is important and what it represents.

The Central Bank of Nigeria monetary policy is a critical macro-economic factor that determined many other macro-economic factors within the Nigerian economy. Monetary policy is usually conducted within the frameworks of monetary targeting. The major instrument of monetary policy remained the open market operation (OMO), complemented by the discount window operations and foreign exchange market interventions.

The stance of monetary policy was to inject liquidity into the economy and restore confidence in the Nigerian financial system. The measures taken included the continuation of guarantees on inter-bank transactions and towards the end of year 2010 the purchase of non-performing loans from the deposit money banks by AMCON. The growth of the key monetary aggregate at the end of 2010 was below the indicative benchmark for fiscal 2010 and the growth rate attained at the end of the preceding year (CBN report, 2010).

In view of the critical role played by this policy to the development of the Nigerian economy and its role in determining the direction of other macro-economic variables, this study captures it as one of the factors to test in determining the extent of variations of returns on pension funds investment once there is change in government economic policy.

Government securities such as Federal government development stocks, FGN bonds and treasury bills dominate the Nigerian money market. This is not to say private sector securities such as certificate of deposit, commercial papers and bankers’ acceptances are not substantially invested. Total money market assets outstanding at the end of 2010 shows an increase of 33% when compared with the increase of 19.1% at the end of 2009. The development was attributed to the increase in the value of FGN bonds, Treasury Bills (NTBs) and Bankers Acceptances (Bas). Government remained the dominant player in the Nigerian money market as government securities constituted 94% of the money market asset outstanding at the end of 2010 (CBN report, 2010). The implication of this is that private sector securities accounted for only 6% of the total assets outstanding in the Nigerian money market.
This development and the outstanding nature of NTBs in terms of value and volume of transactions made the choice of Nigerian Treasury Bills rates an indispensable input in a study of this nature. The choice, therefore, is for this study to determine treasury bills rates impact on the pension investment returns within the period under consideration.

There are many measures of inflation depending on the specific circumstances. The most well known are the Consumer Prices Index (CPI) which measures consumer prices and Gross Domestic Product (GDP) which measures inflation in the whole of the domestic economy. The prevailing view in mainstream economics is that inflation is caused by the interaction of the supply of money with output and interest rate. Mainstream economists views can be broadly divided into two camps: the ‘Monetarists’ who believe that monetary effects dominate all others in setting the rate of inflation and the ‘Keynesians’ who believe that the interaction of money, interest and output dominate over other effects. Other theories, such as those of Austrian school of economics, believe that an inflation of overall prices is a result from an increase in the supply of money by central banking authorities.

Interest rates of deposit money banks in Nigeria play the most significant role in moving the prices of securities in Nigerian stock market. The banking industry that set interest rates must give consideration to other variables in the economy. The interest rates either on call or demand deposit serves as the most influential actors in determining related variables in the other sectors of the economy. In fact, interest rates dictate the flows of investment within the economy. Since stocks and instruments of capital market prices represent the country’s investment market direction, then differences in interest rates must affect the relative worth of stocks in relation to one another.

Also in the same vein, these banks once they announced new interest rates and caused the investment market to experience movements and volatility as a result of these interest rates assumed new trends. In the realm of investment, therefore, accurate speculation of these money deposit banks actions can enhance the investors’ chances for a successful ventures and consequently good returns on investment.

The Nigerian Stock Exchange (NSE) is the physical place of the Nigerian Capital Market. Equity investment is said to be the largest investment in the capital world over. However, in an effort to enhance investor confidence in the Nigerian capital market a number of reforms were carried out by the regulatory authorities. These include the reconstitution of the board and management of the NSE, strengthening of the NSE Arbitration Committee and strict enforcement of the rules and regulations on financial reports by the Securities and Exchange Commission (SEC). In order to improve the efficiency and depth of the market, the daily trading hours on the floor of the Exchange was extended by two (CBN annual report, 2010).

Activities on the floor of the NSE indicated mixed developments (CBN reports, 2010). Aggregated volume of traded securities declined by 9.3% while the value increased by 16.3%. Also, aggregated market capitalisation of the 264 listed securities rose by 41.0% to closed at N9.9 trillion in 2010 and this is a sharp increased compared to N7.0 recorded in 2009. The market capitalisation of the 217 listed equities increased from N5.0 trillion in 2009 to close at N7.9 trillion. The development was due largely to new listings and price appreciation recorded by highly capitalised equities. Of
the N6.2 trillion market capitalisations recorded in 2010, more than 78% were represented by
equities market capitalisation.

Manufacturing Industry in Nigeria is another viable hub for the Nigerian economy. Aggregate
statistics for the Nigerian macro economy and its manufacturing sector show that the 1990s was a
relatively static period. The end of the decade witnessed moderate economic recovery and growth
in the manufacturing sector despite a certain degree of macroeconomic instability. At the end of
the 1990s Nigerian per capita value-added in manufacturing was very low at approximately USD
13, which corresponds to about 10 per cent of the level of Botswana and less than 50 per cent of

Although manufacturing is usually a small sector in African economies, in terms of share of total
output or employment, growth of this sector has long been considered crucial for economic
development. This special interest in manufacturing stems from the belief that the sector is a
potential engine of modernisation, a creator of skilled jobs, and a generator of positive spill over
effects, (Tybout, 2000).

Pension reforms policies are often made with short-term goals in mind, rather than with an
understanding of what the system can and cannot hope to accomplish in the longer run (Olivia and
Gary, 1996). In the first place the policies might sound good but many contingencies might arise
that will severely impaired the cumulative benefits derived from the policy if adequate provision
were not made. Thus, it is indispensable to fully grasp the central mission of any pension reform
which is, as opined by Olivia and Gar (1996), to provide standard of living for people in the old
age. This is because the main rationale behind pension is to protect against old-age economic
insecurity.

Most of the contemporary scholars on new pension and its reform policies are mainly focusing on
four fundamental issues; the safety of the pension investment, policy cost implication,
sustainability and finally the future prospects of the policies. This is because new pension reforms
policies mainly seek to address issues that are driven by cost concerns and rapidly-aging
populations and consequently social security reform has emerged as a center-stage issue
throughout the Latin America and African countries (Olivia, 1996).

Most of the empirical studies conducted in U.S on the performance of pension funds managers in
relation to macro-economic variables concluded that funds managers tend to underperform their
bench-marked portfolio returns (Benedict et al., 2010). For instance, Sharpe (1966), Jensen (1968),
Malkiel (1995) and Gruber (1996) concluded that funds managers did not posses superior
investment selection ability and as such could not outperform their benchmark portfolio returns.
These findings will not go down well with contributors of funds who happened to be the real
owners of the investment. However, Grinblatt and Titman (1992), Hendrics et al. (1993) and
Carhart (1997) found some abnormal positive performance with little empirical evidence to
support it. Thus, their conclusion goes on to state “there is little convincing evidence of abnormal
positive performance by U.S. professional funds managers” (Benedict et al. (2010)).

The major issue of concern is the underperformance of these pension fund managers whether it
will be attributed to poor government economic policies or it is as result of lack of professional
competence on the part of fund managers to outperform the market or both. A further review will give an insight and perhaps reveal the overall picture of these economic variables at play.

Various theories exist linking macro-economic variables and Pension fund Administration in Nigeria, such as the Dow theory, Efficiency Capital market Hypothesis, the Modern Portfolio theory and the Assets Pricing Model (CAPM). But for the purpose of this paper we shall focus on risk-returns trade-offs in relation to macro-economic variables captured by Capital Assets Pricing Model (CAPM)

A conceptual framework of market equilibrium that is used to determine market price for risk of security and it can serve as an appropriate measure for risk of a single security. The model was first introduced by Sharpe (1963), Lintner (1965) and Mossin (1966) to enable risk-averse investors to focus more attention on systematic risk in the pricing of securities. It is assumed, in CAPM model, that ‘the only risk which investors will pay a premium to avoid is market risk’ (Olowe, 2008) as investors can diversify away all unsystematic risk. This is because the covariance of the security return with the market portfolio can never be diversified away by investors.

The major assumptions of this model are that it is a one period model, all investors are risk-averse and the existence of risk-free security. Consequently, the assumptions implied that there is a perfect market and the capital market is efficient. The CAPM model proposes that, in market equilibrium, there will be return-risk relationship for all individual securities. It went ahead to argue that if an individual security is priced in such a way that it has an expected return-risk combination that places it above the security market line it will be under-valued. In this situation, the security will be attractive to investors and consequently, as CAPM proposes, the increase demand for the security will cause the price to rise until an equilibrium situation is reached.

Likewise an over-valued security will be characterised by an expected return-risk combination that places it below security market line. This situation will make the security unattractive to investors and the demand will fall which will cause the prices to fall as well until equilibrium situation is reached again. One thing that is very clear about CAPM theory is that, as long as the market is efficient, one cannot outperform the market. The major assumption in CAPM is that investors have diversified away from the investment all the diversified risk. Thus, the only risk an investor is ready to bargain and pay a price in the market risk.

This study just like Benedict et al. (2010) chose risk free rates of Federal Government bond market with rates of treasury bills maturing more than one year as a yardstick of measurement against the performance of pension fund administrators. The Nigerian bond market is a good measure of performance as all considerations of economic realities are reflected in the rates attached to all instruments of transactions in the market (treasury bills included). This means it will serve as a good benchmark of measuring performance of pension industry in Nigeria. It is pertinent to note that even the CAPM theory recognises risk free rates as an indispensable variable in determining the price of market securities.

3. Methodology and Variable Measurement
This study adopted correlational design using both historical and descriptive methods. It is historical as past records of pooled-time series data was used and it is descriptive as a relationship is to be examined between macro-economic variables (explanatory variables) and pension
investment returns (dependent variable). This research work focuses on pension funds administration in Nigeria with particular emphasis on pension funds investment. The population of this study is made up of five groups operating in the Nigerian pension industry as at 31st December, 2011. The first group is made up of twenty four (24) Pension Funds Administrators (PFAs). The second and third group is made up of seven (7) Closed Pension Funds Administrators (CPFAs) and nineteen (19) Approved Existing Schemes (AES) respectively. Others include those in fourth and fifth group which include four (4) Pension Funds Custodians (PFCs) and six (6) pension departments (civil service, police, military, prison, immigration & customs, securities agencies and FCT pension departments) respectively. This brings us to a total of five groups and each of these groups, with the exception of six pension departments, its report came out in aggregate form on annual basis from the National Pension Commission (PenCom). This study selected the first group of twenty four (24) Pension Funds Administrators (PFAs). This is because it is the only group that all the available information needed for this study is accessible. A period of seven years (2006-2012) is considered. This study collected its data from secondary sources. These include National Pension Commission (PenCom)'s annual reports (2006-2012)), Central Bank of Nigeria (CBN) annual reports of 2010, 2011 and 2012. Others include Nigerian Capital Market Index on investment returns (2006-2012) from the Nigerian Stock Exchange Facts book and National Bureau of Statistics. The data for all the explanatory variables were collected on quarterly bases. The PFAs performance’s proxy is returns on investment (PIRE) while the proxies of macro-economic variables under consideration in this study were monetary policy (CBMR), treasury bills rates (TRBR), general inflation rates (GFLR), money-deposit banks rates (DMBR), equity capital growth rate (CEGR) and Manufacturing index growth rates (MIGR). This study employs the use of multiple regression model and test the hypotheses formulated in this study.

3.1 Model Specification
In order to achieve the objectives of this study and test our hypotheses a functional relationship in form of multi-linear regression model was formulated that consist of all the dependent and independent variables. The model of this study, therefore is written thus:

\[
PIRE = \alpha_t + \beta_1 CBMR + \beta_2 TRBR + \beta_3 DMBR + \beta_4 CEGR + \beta_5 GFLR + \beta_6 MIGR + \epsilon_t 
\]

Where:
- \(\alpha_t\) = Constant
- \(PIRE\) = Pension Investment Returns
- \(B_{1:6}\) = CBN Monetary Policy Rates, Treasury Bills Rates, General Inflation Rates (dummy variable), Deposit Money Banks Rates, Capital market Equity Growth Rates, Manufacturing Index Growth Rates (dummy variable)
- \(\epsilon_t\) = Statistical Error Term

4. Results and Discussion
Economic theory requires that variables be stationary before application of standard econometric techniques. This is to avoid misleading results. In performing the stationarity test a maximum lag of 1 was used, and included the intercept. The result of the stationarity test is presented in table 4.3 below.
Table 4.1.2: ADF Unit Root Test

<table>
<thead>
<tr>
<th>Variables</th>
<th>ADF Test Statistics</th>
<th>Max Lag</th>
<th>Order of Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIRE</td>
<td>-5.271991</td>
<td>1</td>
<td>I(0)</td>
</tr>
<tr>
<td>CBMR</td>
<td>-5.016513</td>
<td>1</td>
<td>I(1)</td>
</tr>
<tr>
<td>TRBR</td>
<td>-6.966166</td>
<td>1</td>
<td>I(1)</td>
</tr>
<tr>
<td>GFLR</td>
<td>-4.466398</td>
<td>1</td>
<td>I(2)</td>
</tr>
<tr>
<td>DMBR</td>
<td>-3.195030</td>
<td>1</td>
<td>I(1)</td>
</tr>
<tr>
<td>CEGR</td>
<td>-7.403267</td>
<td>1</td>
<td>I(1)</td>
</tr>
<tr>
<td>MIGR</td>
<td>-4.477228</td>
<td>1</td>
<td>I(0)</td>
</tr>
</tbody>
</table>

Critical values 1% = -3.699871, 5% = -2.976263, 10% = -2.627420

Extracted from Eviews 6.0 output file (see appendix 10)

The above results in Table 4.3 indicates that C.B.N Monetary Policy Rates (CBMR), Treasury Bills Rates (TRBR), Deposit-Money Banks Rates (DBMR) and Capital Market Equity Investment Growth Rates (CEGR) are integrated of order one I(1) at 5% level of significance with lag 1. General Inflationary Rates (GFLR) is the only variable that is integrated of order two I(2) at 5% level of significance. The only exception were the Pension Investment Returns (PIRE) and Manufacturing Index Growth Rates (MIGR) that were integrated at level I(0). In other words, all the independent variables under consideration in this study are found to be stationary after once or twice with the exception of PIRE and MIGR. Thus, the model follows integrating process.

However, based on the integrating order of the variables, the model needs to be re-stated thus:

$$DDD(PIRE) = C + \beta_1 DDD(CBMR) + \beta_2 DDD(TRBR) + \beta_3 DDD(DMBR) + \beta_4 DDD(CEGR) + \beta_5 DDD(GFLR) + \beta_6 DDD(MIGR) + \beta_7 ECM_{(t-1)}$$

Where:
- $DDD = \text{differencing factor}$
- $(ECM)_{(t-1)} = \text{One period lagged value of the error from the initial regression model}$
- $C = \text{intercept (Constant)}$
- $PIRE = \text{Pension Investment Returns}$
- $B_{1} CBMR = \text{C.B.N. Monetary Policy Rates}$
- $B_{2} TRBR = \text{Treasury Bills Rates}$
- $B_{3} GFLR = \text{General Inflation Rates (dummy variable)}$
- $B_{4} DMBR = \text{Deposit Money Banks Rates}$
- $B_{5} CEGR = \text{Capital market Equity Growth Rates}$
- $B_{6} MIGR = \text{Manufacturing Index Growth Rates (dummy variable)}$
- $B_{7} (ECM)_{(t-1)} = \text{Error Correction Model}$
- $\varepsilon_t = \text{Statistical Error Term}$

Table 4.1.3: Dependent Variable: PIRE

Descriptive Statistics Results Computed using E-views 6.0

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficients</th>
<th>Std. Error</th>
<th>t-Statistics</th>
<th>Prob.(values)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.906822</td>
<td>9.460417</td>
<td>0.095854</td>
<td>0.9248</td>
</tr>
<tr>
<td>CBMR</td>
<td>0.366457</td>
<td>5.794675</td>
<td>0.063240</td>
<td>0.9503</td>
</tr>
<tr>
<td>TRBR</td>
<td>-5.671444</td>
<td>1.520994</td>
<td>-3.728775</td>
<td>0.0017</td>
</tr>
</tbody>
</table>
The regression model will now be re-stated for easy analysis as follows:
\[
DDD(PIRE) = C + \beta_1 DDD(CBMR)_t + \beta_2 DDD(TRBR)_t + \beta_3 DDD(GFLR)_t + \beta_4 DDD(DMBR)_t + \beta_5 DDD(CEGR)_t + \beta_6 DDD(MIGR)_t + \beta_7 ECM(t-1)..........
\]

The re-stated regression equation above considered the macro-economic variables that are the drivers of government economic policies as they impacted on the Pension Investment Returns (PIRE). Substituting the computed coefficient values of the explanatory variables from table 4.4 above, we will have thus:

\[
PIRE = 0.9068 + 0.3665CBMR - 5.6714TRBR - 6.7444GFLR - 6.9924DMBR - 0.0716CEGR + 0.1146MIGR + 9.4604
\]

From equation (4) above, TRBR, GFLR, DMBR and CEGR are negative values which explained their inverse relationship with the returns on pension funds investment (PIRE). On the contrary, both CBMR and MIGR are having positive values which show their positive impact on the returns on pension funds investment.

The coefficients indicated that in the event of any new monetary policy pronouncement that adjusted the direction of these macro-economic variables under consideration in this study, a 1% increase in CMBR will result in a corresponding increase in pension investment return (PIRE) by 37% and a 1% increase in MIGR will result in a corresponding increase in PIRE by 12%. On the contrary, a 1% increase in TRBR will result in a decrease in PIRE by 5.67% and a 1% increase in GFLR will result in a decrease in PIRE by 6.74%. Similarly, a 1% increase in DMBR will result in a decrease in PIRE by 6.99% and a 1% increase in CEGR will result in a decrease in PIRE by 0.072% accordingly.

The probability of t-significant values of most of the macro-economic variables under consideration in this study indicated a significant relationship; from table 4.4 above a significant relationship, at 1%, could only be established for TRBR, GFLR and CEGR. Also at 10%, a significant relationship is established for ECM. On the contrary, CBMR, DMBR and MIGR are insignificant at 1%, 5% and 10% respectively.

The summary of the above analysis is as stated below.

**T-Test:** - Decision Rule: If p-value (probability) of t-statistics is lower than 0.05 reject the null hypothesis that the variable is statistically insignificant at 5% level. From table 4.4 above, the probability of t-statistics of TRBR, GFLR and DMBR are significant at 1% level, while the intercept, CBMR, CEGR and MIGR are not.

**Table 4.1.4: Inferential Statistics Results computed using E-views 6.0**
The statistical results in Table 4.5 above indicated that correlation between dependent variable (PIRE) and independent variables (CBMR, TRBR, GFLR, DMBR, CEGR & MIGR) is significant. The $R^2$ (the multiple coefficient of determination) is more than 65% and the adjusted $R^2$ is also more than 50% which re-affirmed and explained the overall fitness of the regression model of this study. In summary the results can be presented below.

**R-Squared:** the $R^2$ value shows that more than 65% of variations or movements in pension investment returns are explained by the movements of the explanatory (macro-economic) variables under consideration in this study which include CBMR, TRBR, GFLR, DMBR, CEGR and MIGR. The remaining percentage of a little above 30% of variations in pension investment returns will be attributed to other exogenous factors not considered in the model or not related with the included explanatory variables under consideration in this study.

The adjusted $R^2$ of more than 50% compliments the high explanatory power of the $R^2$ and therefore re-affirms the validity of the results.

**Durbin Watson (DW) Statistics:** - The Durbin-Watson (DW) statistics is 2.8815. From the Durbin-Watson table (Gujarati, 2009), with 5 percent level of significance, $n = 28$ observations and $k^I = 6$ independent variables, the significance points of $d_L$ and $d_u$ are 0.951 and 1.958 respectively. The calculated DW statistics of 2.8815 is greater than the upper 1.958, that is, $d_u < 2.8815$. This implies that there is no evidence of positive first order serial correlation among the explanatory variables.

The summary of the above analysis is as stated below.

**F-Test:** - Decision Rule: If p-value (probability) of F-statistics is lower than 0.05 reject the null hypothesis that all the variables are statistically insignificant at 5% level. The results, on the overall, shows that all the variables including the intercept are significant at 1% level and consequently all the hypotheses, 1, 2, 3 and 4 formulated in chapter one are, therefore, rejected by this study.

The overall result indicates that, at 1% level of significance, based on F-statistics test (and p-value of F-test in table 4.5 above), all the explanatory variables (CBMR, TRBR, GFLR, DMBR, CEGR and MIGR) are significant. Looking at table 4.5 above, the probability of F-statistics is significant at 1% and this is the main area of concern as the study is more interested in combined impact of all the explanatory variables on the dependent variable rather than the individual impact of the explanatory variables.

This means the overall performance of Pension Fund Administrators (PFAs) in Nigeria are significantly affected, positively and negatively, by the individual as well as combined movements of the explanatory (macro-economic) variables under consideration in this study.
Table 4.1.5: Johansen Cointegration Test:
Unrestricted Cointegration Rank Test (Trace):

<table>
<thead>
<tr>
<th>Hypothesized No. of CE(s)</th>
<th>Eigenvalue</th>
<th>Trace Statistics</th>
<th>0.05 Critical Value</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>None *</td>
<td>0.978765</td>
<td>232.7929</td>
<td>125.6154</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 1 *</td>
<td>0.875126</td>
<td>132.6387</td>
<td>95.75366</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 2 *</td>
<td>0.768990</td>
<td>78.54694</td>
<td>69.81889</td>
<td>0.0085</td>
</tr>
<tr>
<td>At most 3</td>
<td>0.613210</td>
<td>40.44925</td>
<td>47.85613</td>
<td>0.2068</td>
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<tr>
<td>At most 4</td>
<td>0.260587</td>
<td>15.75254</td>
<td>29.79707</td>
<td>0.7296</td>
</tr>
<tr>
<td>At most 5</td>
<td>0.148111</td>
<td>7.903173</td>
<td>15.49471</td>
<td>0.4758</td>
</tr>
<tr>
<td>At most 6</td>
<td>0.133826</td>
<td>3.735401</td>
<td>3.841466</td>
<td>0.0533</td>
</tr>
</tbody>
</table>

Trace test indicates 3 cointegrating equ(s) at the 0.05 level
*Denotes rejection of the hypothesis at 0.05 level
**MacKinnon-Haugh Michelis (1999) p-values
Source: Extracted from Eviews 6.0 output file (see appendix 12)

Table 4.1.5.1:
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

<table>
<thead>
<tr>
<th>Hypothesized No. of CE(s)</th>
<th>Eigenvalue</th>
<th>Max-eigen Statistics</th>
<th>0.05 Critical Value</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>None *</td>
<td>0.978765</td>
<td>100.1542</td>
<td>46.23142</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 1 *</td>
<td>0.875126</td>
<td>54.09172</td>
<td>40.07757</td>
<td>0.0007</td>
</tr>
<tr>
<td>At most 2 *</td>
<td>0.768990</td>
<td>38.09769</td>
<td>33.87687</td>
<td>0.0147</td>
</tr>
<tr>
<td>At most 3</td>
<td>0.613210</td>
<td>24.69670</td>
<td>27.58434</td>
<td>0.1122</td>
</tr>
<tr>
<td>At most 4</td>
<td>0.260587</td>
<td>7.849371</td>
<td>21.13162</td>
<td>0.9127</td>
</tr>
<tr>
<td>At most 5</td>
<td>0.148111</td>
<td>4.167772</td>
<td>14.26460</td>
<td>0.8412</td>
</tr>
<tr>
<td>At most 6</td>
<td>0.133826</td>
<td>3.735401</td>
<td>3.841466</td>
<td>0.0533</td>
</tr>
</tbody>
</table>

Maximum eigenvalue test indicates 3 cointegrating equ(s) at the 0.05 level
*Denotes rejection of the hypothesis at 0.05 level
**MacKinnon-Haugh Michelis (1999) p-values

The results from tables 4.6 and 4.7 above of both Trace and Maximum-eigenvalue tests respectively indicate the presence of 3 cointegrating equations at 5 percent level of significance thereby confirming the existence of long-run equilibrium relationship between pension investment returns (PIRE) and the explanatory variables (CBMR, TRBR, GFLR, DMBR, CEGR and MIGR) under consideration in this study. These results will be interpreted to mean that the regression model is not spurious and the conclusions on them are valid based on the present prevailing economic circumstances.

4.2 Findings and the Policy Implication of the Study

(i). Monetary policy rates have significant positive impact on PFAs performance in Nigeria:
The results in table 4.1.4 (inferential statistics) above showed that CBMR is significant at 1% based on the p-value of F-statistics. It follows, therefore, that this study, based on F-statistics results in table 4.1.4 above, rejected hypothesis 1 formulated in chapter one and confirms that there exist significant relationship between CBMR and PIRE.

(ii). Money-deposit banks’ rates have significant impact on PFAs performance in Nigeria:
Based on p-value of t-statistics results in table 4.1.3 above, DMBR is significant at 1%. Similarly, the p-value of F-statistics in table 4.1.4 above, at 1%, indicated significant relationship between
DMBR and PIRE. However, the coefficient value indicates that, even though there is significant relationship, it is negative. In other words, any increase of 1% in DMBR will cause a corresponding decrease of 6.9% in PIRE as indicated in table 4.1.3 above.

(iii). **Treasury Bills rates have significant impact on PFAs performance in Nigeria:**
TRBR is significant at 1% based on p-value of t-statistics in table 4.4 above. In the same vein, based on p-values of F-statistics results in table 4.5 above, TRBR is significant at 1% level of significance. Nevertheless, the coefficient value indicates that, even though the relationship is significant, it is negative. This is because as the coefficient value in table 4.4 above indicates, in the event of any increase in TRBR by 1% it will cause a corresponding decrease of 5.7% of PIRE.

(iv). **Equity capital growth rates have significant impact on PFAs performance in Nigeria:**
The result of t-statistics in table 4.4 above shows that CEGR is not significant and the coefficient value also shows that there is an inverse relationship between CEGR and PIRE. On the contrary, the F-statistics results in table 4.5 above shows that at 1%, CEGR is significant. This means CEGR combined with other variable significantly influenced the variations of pension funds investment returns in Nigeria.

5.1 **Conclusion and Recommendations**
The findings from this study revealed that, at 1% level of significance (i.e. F-statistics results in table 4.1.4 above), all the explanatory variables under consideration in this study (CBMR, TRBR, GFLR, CEGR, DMBR, & MIGR) significantly influenced the variations in pension investment returns in Nigeria (PIRE). This study has established, therefore, that at 1% level of significance (i.e. the probability of F-statistics in table 4.5 above), monetary policy rates (CBMR), deposit-money banks rates (DMBR) and by extension government policy toward regulating interest rates in Nigeria, individually or combined with other variables, significantly and positively influenced the variations in pension investment returns (PIRE), While treasury bills rates (TRBR) and equity-capital growth rates (CEGR) significantly and negatively influenced variations or movements of pension investment returns (PIRE) in Nigeria. The study can infer that both operational policies of the Nigerian bond and capital market significantly and negatively influenced variations or movements of pension investment returns (PIRE) in Nigeria. It is therefore recommended amongst others that the government should provide ways of improving pension funds investment management strategy for enhanced performance in Nigeria. Government at federal level should always ensure that economic policies, especially monetary policies that are found in this study to have positive impact on the returns on pension investment are adequately scrutinised to ensure that they will positively affect the investment atmosphere. This can only be achieved through the concerted effort of agencies such as Central Bank of Nigeria, National Economic Intelligence Agency, National Planning Commission, National Bureau of Statistics, Economic Summit Group and Professional bodies of Accounting. Also based on the significant negative relationship between deposit-money banks rates and pension investment returns, proper organisation of strong consultative committee should be made to include Bankers’ Committee, Chartered Institute of Bankers, Nigerian Investors forum and other professional stake-holders in the banking industry to ensure that before any adjustment or review of interest rates are made, other economic indices may be taken in to consideration to ensure that the interest rates positively affect the returns on investment, especially the returns on pension investment. In addition, Debt Management Office (DMO) in collaboration with Central Bank of Nigeria (CBN) should set up a team of professionals
that will be charged with the responsibility of setting minimum and maximum ceiling of treasury bills rate (TRBR). The task of the team is to embark on extensive researches at certain intervals that will give a clue on the rate to advise the DMO to fix on treasury bills that will not have negative effect on other investment returns, especially pension investment returns (PIRE). Finally, there is the need on the part of Pension Commission (PenCom) to relax some restrictions on the investment guidelines so that substantial investment in equity could be made by the pension funds administrators.

References
Federal Republic of Nigeria Official Gazette (30th June, 2004), No. 60, Vol. 91, Government Notice No. 133
Investment Regulations on Pension Funds Assets (December 2010): Issued by The National Pension Commission
National Pension Commission Annual Report, 2009

The New Pension Reform Act, 2004:a
The New Pension Reform Act, 2004:b
The New Pension Reform Act, 2004:c
Turgot, A.R.J (1766) “Reflections on the Formation and Distribution of Wealth” Published in 1969