Can Nigerian RSA's Beat Inflation?

Oladayo Oduwole
P. O. Box 50287, Falomo, Ikoyi, Lagos, Nigeria
* E-mail: Oladayo@cefmr.com

Abstract
This paper aims to review and replicate the performance of the funds managed under the 2004 Pension reform act ("Old Act") of Nigeria and its subsequent repeal. I utilise Ordinary Least Squares ("OLS") regression analysis in an attempt to replicate the returns on Net Asset Values ("NAV") published by some of the Licensed Pension Fund Administrators ("PFA"). The Old Act allows for active fund management of both equity and fixed income instruments on Nigerian assets. I attempt to replicate the published NAV results using four Nigerian financial instruments to ascertain if passive alternatives to active management by the PFA's at lower cost and transaction fees can be created. The performance of 10 Nigerian PFA's run by fund managers in the period December 2006 to December 2014 is reviewed and presented.The evidence from this study indicates that the performance of the 10 PFA's cannot be replicated using four simple financial instruments. Since the Old Act allows for an allocation of up to 80% of assets in bonds, a simple t test is performed to ascertain whether PFA's mark to market their portfolio's adequately.
Keywords: Pension Funds, Nigeria, PFA's, T Test, Out-Performance.

1. Introduction

The introduction of the Pension Reform Act 2004 ("Old Act") led to the creation of a new class of money managers in Nigeria. An objective review of the performance of these money managers hasn't occurred so far due to the inadequacy of information in the public domain and the infancy of the scheme. In this article, I discuss the results of the performance of the pension fund administrators, the impact of inflation on RSA returns and the results of a test on the impact of financial reporting on the performance in line with the guidelines of the Pension Reform Act.

According to Odia and Okoye (2012), "the system of pensions was introduced into Nigeria by the Colonial administration pre Nigeria's independence from the British Empire. The first legislative document on pensions in Nigeria was the 1951 Pension Ordinance which had retroactive effect from January 1, 1946. The Ordinance provided public servants with both a pension and a gratuity (Ahmad, 2006). The National Provident Fund (NPF) scheme established in 1961 was the first legislation to address pension matters of private organizations in Nigeria. This was the first social protection scheme for the non-pensionable private sector employees in Nigeria. It was mainly a saving scheme where both employee and employer contributed the sum of N4 each on a monthly basis. The scheme provided for only one-off lump sum benefit payment (Ahmad, 2006)".

The Pension Reform Act 2014 ("The Revised Act") was passed into Nigerian law on July 1, 2014. The Act repeals the Pension Reform Act 2004 and now governs and regulates the administration of the uniform Contributory Pension Scheme for both the Public and Private Sectors in Nigeria. The pension scheme is broadly divided into the defined contribution plan and the defined benefits plan. In defined contribution plan, a contribution rate is fixed. For instance, in Nigeria under the Old Act, an employee contributes 7.5% of his monthly emolument while the employer also contributes same amount or more depending on the category of employee. The retirement benefit is variable depending on the performance of the investment selected. In defined benefit plan, the retirement benefits is stipulated usually as a percentage of average salary, but the contribution will vary according to the percentage of the average compensation a participant receives during his or her three earning years under the plan (Owojori, 2008). The Revised Act has now moved the contribution rates upward. An Employer is obliged to deduct and remit contributions to a Custodian within 7 days from the day the employee is paid his salary while the Custodian shall notify the PFA within 24 hours of the receipt of the contribution. Contributions and retirement benefits are tax exempt.

The employee opens an account known as a Retirement Savings Account ("RSA") in his name with a Pension Fund Administrator of his choice. This individual account belongs to the employee and will remain with him through life. He may change employers or pension fund administrators but the account remains the same. However, this is still under review. The employee may only withdraw from this account at the age of 50 or upon retirement thereafter. The scheme requires pension funds to be privately managed by Pension Fund Administrators ("PFAs") and Pension Fund Custodians ("PACs").

Pension Fund Administrators have been duly licensed to open retirement savings accounts for employees, invest and manage the pension funds in instruments specified by the investment guideline approved and occasionally modified by the National Pension Commission in Nigeria ("Pencom") from time to time, maintain books of accounts on all transactions relating to the pension funds managed by it, provide regular

information on investment strategy to the employees or beneficiaries and pay retirement benefits to employees in accordance with the provisions of the Act. The usefulness of the PFAs to the RSA account holder should therefore not be limited to safe custody of funds under management but also the ability to earn good return on investment.

Pension Fund Custodians are responsible for the warehousing of the pension fund assets. It is envisaged that at no time will the PFAs hold the pension funds' assets. The employer sends the contributions directly to the Custodian, who notifies the PFA of the receipt of the contribution and the PFA subsequently credits the retirement savings account of the employee. The Custodian will execute transactions and undertake activities relating to the administration of pension fund investments upon instructions by the PFA.

Pencom is the regulator for the Nigerian pension fund industry and prepares reports annually, quarterly and monthly on the state of the industry. In the third quarter report for 2014 issued by Pencom, the total value of pension assets in Nigeria was N4.6 Trillion. The RSA's activefund accounted for 62.78% of all PFA assets. The Pension fund management industry have four different categories of accounts, RSA active ("RSA"), RSA Retiree ("Retiree"), Closed Pension Fund Accounts ("CPFA") and Approved Existing Scheme ("AES"). The focus of this paper is the RSA's. According to Pencom, there are 20 PFAs, 7 CPFAs and 4 Custodians. Individuals invest in RSA's and the aggregate investment and returns thereon generated determine the NAV. Individuals therefore purchase of units of the RSA at Net Asset Values (NAVs). An NAV is the value of the assets held by a PFA after running expenses are deducted.

2. Data Analysis

To assess the performance of RSA active funds and invariably the pension fund administrators, I collected all the NAV's per share available publicly on websites and annual reports of 10 of the 20 public PFA's between December 2006 and December 2014. The fund managers in the study include;

1. Aiico Pension Managers Limted
2. ARM Pension Managers Limited
3. Future Unity Glanvils Pensions Limited
4. IEI-Anchor Pension Managers Limited
5. Legacy Pension Managers Limited
6. Penman Pensions Limited
7. Pensions Alliance Limited
8. Sigma Pensions Limited
9. Stanbic IBTC Pension Managers Limited
10. Trustfund Pensions Plc

Table 1: NAV's of RSA Active funds run by some Licensed PFA's in Nigeria

Fund Manager - RSA - NAV's	2006	2007	2008	2009	2010	2011	2012	2013	2014
Aiico	0.97	1.15	1.19	1.33	1.46	1.51	1.68	1.84	2.00
ARM	1.16	1.46	1.47	1.60	1.77	1.80	2.08	2.44	2.60
FUG			0.97	1.02	1.21	1.30	1.45	1.65	1.76
IEI		1.05	1.04	1.13	1.23	1.28	1.38	1.55	1.65
Legacy	1.14	1.36	1.35	1.56	1.72	1.822	2.03	2.26	2.43
Penman						1.26	1.47	1.59	1.71
Pal		1.33	1.32	1.46	1.64	1.67	1.89	2.15	2.30
IBTC				1.51	1.71	1.78	2.05	2.37	2.52
Trust Fund	1.09	1.35	1.47	1.59	1.70	1.74	1.90	2.22	2.32
Sigma		1.40	1.31	1.49	1.67	1.70	1.91	2.17	2.15

The rate of return to each RSA account year on year are shown in table 2

Table 2: Rates of return on RSA active funds run by some Licensed PFA's in Nigeria

RSA –Nominal returns	2006	2007	2008	2009	2010	2011	2012	2013	2014
Aiico		18.39%	3.35%	11.71%	10.48%	2.98%	11.45%	9.46%	8.88%
ARM		25.70%	1.13%	8.57%	10.51%	1.87%	15.51%	17.17%	6.69%
FUG		N/A	N/A	4.84%	18.50%	7.66%	11.35%	14.25%	6.47%
IEI		N/A	-1.42%	9.29%	8.38%	3.76%	8.13%	12.73%	5.95%
Legacy		19.29%	-0.38%	15.59%	9.87%	6.21%	11.50%	11.04%	7.89%
Penman		N/A	N/A	N/A	N/A	N/A	15.90%	8.17%	7.71%
Pal		N/A	-0.26%	9.88%	12.48%	1.78%	13.34%	13.63%	7.17%
IBTC		N/A	N/A	N/A	12.93%	4.24%	15.26%	15.37%	6.12%
Trust Fund		24.85%	8.31%	8.57%	6.88%	2.36%	9.30%	16.74%	4.54%
Sigma		N/A	-6.36%	13.62%	12.41%	1.58%	12.88%	13.11%	-0.94%
Sum	**79.60%**	22.06%	0.62%	10.26%	11.38%	3.60%	12.46%	13.17%	6.05%
Áverage	**9.95%**								
Standard deviation	**6.20%**								
Sharpe ratio	**-0.81**								

The results show that on average, PFA's have returned about 10% between years 2006 – 2014, with 2007 showing the highest rate of return and 2008 showing the worst rate of return. These results seem good for a fund and could be heralded as a success when compared to the 8% delivered by the Nigerian all share index ("NSE ASI") within the intervening time. The NSE ASI has however returned a higher rate since the 2000, year on year.

In the guidelines instructing the investment universe of PFA's, it seems that the impact of inflation on RSA returns has not been fully considered. The priority of pension fund administrators should be to keep returns well ahead of inflation at most times. When inflation is taken into account, the average real rate of return is -3.12% between 2006 and 2014. Put differently, when inflation is taken into account, pension fund assets have been declining in value by 3% year on year since 2006. Inflation in this case is the annual consumer price index published by the Nigerian National Bureau of Statistics.

Based on this result, one can conclude that considering the underlying interest being served, the pension industry is not adequately delivering the right level of returns to Nigerian workers and their savings are being depleted by inflation. Year on year, each naira saved by workers is worthless than it was the previous year. The industry therefore needs to change to deal with "inflation eating into workers' pensions".

Table 3: Rates of return on RSA funds net of Inflation

RSA –Real returns	2006	2007	2008	2009	2010	2011	2012	2013	2014
Aiico		13.00%	-8.23%	-0.65%	-3.24%	-7.93%	-0.79%	0.94%	0.88%
ARM		20.31%	-10.45%	-3.79%	-3.21%	-9.04%	3.27%	8.65%	-1.31%
FUG		N/A	N/A	-7.52%	4.78%	-3.25%	-0.89%	5.73%	-1.53%
IEI		N/A	-13.00%	-3.07%	-5.34%	-7.15%	-4.11%	4.21%	-2.05%
Legacy		13.90%	-11.96%	3.23%	-3.85%	-4.70%	-0.74%	2.52%	-0.11%
Penman		N/A	N/A	N/A	N/A	N/A	3.66%	-0.35%	-0.29%
Pal		N/A	-11.84%	-2.48%	-1.24%	-9.13%	1.10%	5.11%	-0.83%
IBTC		N/A	N/A	N/A	-0.79%	-6.67%	3.02%	6.85%	-1.88%
Trust Fund		19.46%	-3.27%	-3.79%	-6.84%	-8.55%	-2.94%	8.22%	-3.46%
Sigma		N/A	-17.94%	1.26%	-1.31%	-9.33%	0.64%	4.59%	-8.94%
Average	**-3.12%**	16.67%	-10.96%	-2.10%	-2.34%	-7.31%	0.22%	4.65%	-1.95%

The returns stipulated by the guidelines have not delivered above inflation returns; therefore we have to look for an alternative allocation of capital to improve returns.

3. Regression Analysis

Since the RSA's have not delivered above inflation returns, I tried to decipher the underlying cause of this underperformance. The expected explanation would be from the portfolio structure or weights of the RSA funds. I performed regression analysis on the annual returns for each RSA on the following proxies for equities, bonds, real estates and rates. The proxies used were;

1. The NSE ASI,
2. Access Bank total return FGN bond index ("bond index"),

3. The price of the common stock of Union Homes Savings and Loans Plc (proxy for real estate)
4. The continuous bank open buy back rate (OBB) since 2008.

$$r_i = \alpha_i + \beta_i r_1 + \beta_i r_2 + \beta_i r_3 + \beta_i r_4 + \varepsilon_i \qquad (1)$$

$$R_t = (\frac{P_t}{P_{t-1}}) - 1 \qquad (2)$$

Equation (1) represents the simple OLS regression utilized to determine the appropriate weights for the new PFA portfolio. The coefficients of the returns are expected to represent the portfolio weights in the results. Equation (2) shows how the NAV's are transformed into returns, Where R_t is the return at time t, P_t is the current NAV at time t, P_{t-1} is the earlier period NAV.

The NSE ASI and Union Homes historical stock price were collected from the Nigerian Stock Exchange Data team, Access Bank total return FGN bond index was collected from the Access Bank website and OBB rates were collected from the FMDQ website.

The results of the simple regressions showed that the four factors stated above do not explain the returns of the RSA NAV's. None of the factors were statistically significant at 95% or 90% confidence levels. Therefore it is difficult to decipher how the performance of the RSA's could be improved in line with the four factors listed above. A further review of the basic statistics, show that the RSA returns reported by the PFA's show less variation than that for the bond index. The Access Bank bond index had a historical standard deviation of 8.5% whilst the average RSA NAV varied by 6.2% over the period.

PFA RSA's returns are hence less volatile than the returns of Nigerian Federal Government Bonds, when the bond index is utilized as a proxy. The Old Act allows PFA's to invest as much as 80% of their assets in Nigerian Naira denominated bonds. If this is the case, then it's not probable that RSA returns should vary less than the returns to government bonds.

A possible reason for the lower variability is the interpretation of IAS 39, an accounting standard under the International GAAP. IAS 39, guides the presentation of financial instruments in audited financial statements and provides guidance on how instruments are to be classified. If Bonds are classified as held to maturity, there is no requirement to mark their value to current market prices (Mark to Market). If assets are not marked to market, they do not exhibit a similar level of volatility as assets that are marked to market.

The absence of marking to market of RSA bond portfolios is a potential reason for the lower variability in RSA returns and difficulty to proffer new portfolio weights in line with historical performance of the RSA's. To ascertain whether in reality the returns are significantly skewed away from the realities of the market, I performed a two tailed t test for statistical significant to test the null that the returns generated the PFA's are not statistically different from what one would expect if the RSA's followed Pencom's guidelines and marked to market accordingly. The results of the t test showed that the returns were statistically different from what one would expect if the RSA's marked to market their portfolio per accounting best practice. Therefore, it seems PFA's do not mark to market some of the instruments in their portfolio. The implications of not marking the value of RSA assets to current market condition will generally only manifest if there is a forced sale of RSA assets.

4. Conclusion

In summary, RSA Nav's over the last 8 years in nominal terms have grown, however in real terms they have declined due to inflation and low rates of return. RSA's returns variability seem to be different from what the underlying portfolio constituents would dictate, therefore making it difficult to proffer different portfolio weights that might improve performance. The simple statistical test confirms that the variability is statistically significant. The Pension fund industry therefore needs to review its recording of NAV performance and adjust its portfolio weights and constituents to deliver above inflation returns to RSA unit holders. The new yard stick should be positive inflation adjusted returns.

5. Table of Regression Results

Ordinary Least-Squares Estimates

R-squared	0.93		
Rbar-squared	0.79		
sigma^2	0.00		
Durbin-Watson	2.07		
Nobs, Nvars	7,5		
Dependent	AIICO		
Variable	Coefficient	t-statistic	t-probability
CONSTANT	0.16	4.13	0.05
NSE ASI	0.03	0.98	0.43
Bond	0.10	0.87	0.47
Union Homes	0.06	1.40	0.30
Rates	-0.79	-2.48	0.13

Ordinary Least-Squares Estimates

R-squared	0.63		
Rbar-squared	-0.10		
sigma^2	0.01		
Durbin-Watson	1.56		
Nobs, Nvars	7,5		
Dependent	ARM		
Variable	Coefficient	t-statistic	t-probability
CONSTANT	-0.16	-0.90	0.46
NSE ASI	0.22	1.37	0.30
Bond	0.23	0.46	0.69
Union Homes	-0.16	-0.87	0.48
Rates	0.02	0.02	0.99

Ordinary Least-Squares Estimates

R-squared	0.84		
Rbar-squared	0.53		
sigma^2	0.00		
Durbin-Watson	2.15		
Nobs, Nvars	7,5		
Dependent	IEI		
Variable	Coefficient	t-statistic	t-probability
CONSTANT	0.16	2.22	0.16
NSE ASI	0.14	2.23	0.16
Bond	-0.14	-0.70	0.56
Union Homes	-0.03	-0.36	0.75
Rates	-0.94	-1.59	0.25

Ordinary Least-Squares Estimates

R-squared	0.69		
Rbar-squared	0.06		
sigma^2	0.00		
Durbin-Watson	2.14		
Nobs, Nvars	7,5		
Dependent	LEGACY		
Variable	Coefficient	t-statistic	t-probability
CONSTANT	0.17	1.49	0.28
NSE ASI	0.12	1.18	0.36
Bond	-0.01	-0.02	0.99
Union Homes	-0.04	-0.36	0.76
Rates	-0.97	-1.04	0.41

Ordinary Least-Squares Estimates

R-squared	0.97		
Rbar-squared	0.92		
sigma^2	0.00		
Durbin-Watson	2.08		
Nobs, Nvars	7,5		
Dependent	PAL		
Variable	Coefficient	t-statistic	t-probability
CONSTANT	0.18	5.01	0.04
NSE ASI	0.13	3.96	0.06
Bond	0.02	0.23	0.84
Union Homes	0.04	1.08	0.39
Rates	-1.00	-3.34	0.08

Ordinary Least-Squares Estimates

R-squared	0.54		
Rbar-squared	-0.38		
sigma^2	0.00		
Durbin-Watson	1.58		
Nobs, Nvars	7,5		
Dependent	TRUST FUND		
Variable	Coefficient	t-statistic	t-probability
CONSTANT	0.10	0.80	0.51
NSE ASI	0.13	1.15	0.37
Bond	0.02	0.06	0.96
Union Homes	-0.06	-0.48	0.68
Rates	-0.36	-0.35	0.76

Ordinary Least-Squares Estimates

R-squared	0.92		
Rbar-squared	0.75		
sigma^2	0.00		
Durbin-Watson	1.72		
Nobs, Nvars	7,5		
Dependent	SIGMA		
Variable	Coefficient	t-statistic	t-probability
CONSTANT	0.18	1.86	0.20
NSE ASI	0.29	3.37	0.08
Bond	-0.08	-0.30	0.79
Union Homes	-0.12	-1.25	0.34
Rates	-1.46	-1.83	0.21

References

Egbe, G.A, Awoyemi, C.A, Osu, B.O. (2013) *Portfolio Optimization of Pension Fund Contribution in Nigeria*, Journal of Mathematical Theory and Modeling, Vol 3, No.8

IAS 39, as published by the International Accounting Standards Board ("IASB")

Odia, J.O, Okoye, A.E (2012) *Pensions Reform in Nigeria: A comparison between the Old and the New Scheme*, Afro Asian Journal of Social Sciences, Volume 3, No. 3.1

Oduwole, O. (2015) *The Performance of Nigerian Mutual Funds in the Period 2011 – 2014,* Journal of Mathematical Theory and Modeling, Vol 5 , No.3

Pension Reform Act 2014, Official Gazette - http://www.pencom.gov.ng/

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:
http://www.iiste.org

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: http://www.iiste.org/journals/ All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: http://www.iiste.org/book/

Academic conference: http://www.iiste.org/conference/upcoming-conferences-call-for-paper/

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digtial Library , NewJour, Google Scholar