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Determinants of Pension Fund Investment in Nigeria: The Critical Factors

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Abstract

Pension fund is a pool of resources contributed by the employees with the aim of having enough resources to carter for their needs after retirement. Therefore, pension fund needs to be invested so as to meet the aim of the contributors. This study was carried out to evaluate the factors that determine investment of Pension Funds. The study used primary data, which were generated by the use of questionnaire. Respondents were selected from a sample of five PFAs in Nigeria using simple random sampling technique. A total of 125 questionnaires were administered on 18 items using likert scales. Data collected were analyzed using factor analysis by principal component. Economic, Risk and Security of real estate factors were identified as the major determinants of pension fund investment. The study concludes that variables such as interest rate, internal control system etc, are not critical in determining investment of pension funds in Nigeria. The study also recommends that pension fund managers should develop good systems of mitigating on the enormous risks they face in their duty as investment managers.

Key words: Pension fund, Determinants, Defined contribution, Retirement benefits, Pension fund administrator

Introduction

Pension schemes the world over operate under the basic principles that seek to ensure growth of pension assets to provide an adequate replacement rate for life in retirement without compromising the security of pension investments (Barrow, 2008). Regardless of the particular form of a pension scheme, investment decisions need to be taken, taking into account the retirement benefits that are guaranteed or targeted. In other words, the key task is to ensure that at the end of the day, assets (contributions plus investment returns) are adequate to pay for liabilities at the time they fall due. In the case of a defined benefit (DB) plan, the plan liabilities are defined by the obligations stipulated in the arrangement. In a defined contributory (DC) plan, on the other hand, each individual member of the plan must determine what his targeted benefit level is.

In all cases, a basic decision must be made about how to allocate pension fund assets among the various asset categories and financial instruments available, both to ensure sufficient investment return over time and to ensure that unnecessary volatility does not result in a significant reduction in asset values at the time when the plan's need for liquidity increases.

Like Chile and some other countries, Nigeria had a pension reform in 2004. The Act introduced a defined contributory pension system which is based on individual accounts that are privately managed by Pension Fund Administrators (PFAs). The new scheme, which as the name suggests, is contributory in nature, making it mandatory for employers and workers (in the public sector and private sector organisations with 5 or more employees) to contribute 7.5% each of the emoluments of the employee into a Retirement Savings Account (RSA). The Act also empowers PFAs to take investment decisions on behalf of RSA holders.

In a defined contributory pension system, the objective is to grow the pension contributions over time in a manner that will ensure that individual RSA holder's (contributor's) retirement benefits is sufficient to sustain their livelihood in retirement without compromising the security of the fund. Thus, retirement benefit under a DC is a function of contributions made over the employee's working life plus the investment returns earned on it. Therefore, retirement benefits are enhanced by aggressive savings, as well as quality of investment management. However, the contribution by the employee is defined and all things being equal is certain, but the returns to be earned on it depends on the competency of the fund manager (PFA). This makes retirement benefits under a DC pension system volatile. More so, the overwhelming issue in investment of pension fund is that in most DC arrangements such as the one in Nigeria, investment risks are born by individual RSA holder.

The greatest challenge of pension fund managers globally is to continue to maintain an appropriate level of investments and pay retirement benefits as at when due (BGL, 2010). However, this is difficult as a result of increasing pressures from regulations, governance, investment strategies and other related factors. Pension fund like every other investors are faced with the same basic issues regarding investments. And since industrial harmony is seldom realisable due to the complex nature of business environment, investment of pension fund is influenced by both internal and external environmental factors such as political, economic, social etc (Akinwale and Abiola, 2007).

This study therefore seeks to identify those factors that are critical in determining asset

allocation of pension fund in a DC system in Nigeria.

Literature Review

Overview of Pension Fund Management

Pension fund managers are financial institutions for the accrual of funds to meet future pension liabilities. The most important type is the employer- sponsored pension plan (Byrne, 2003). These plans vary in form and complexity, but they all share certain common elements in every country. In general, investment strategy depends on the type of plan (McGill, 1984).

According to Bodie, Z., Kane, A. and Marcus, J. A. (2009), pension plans are defined by the terms specifying 'who, when, and how much' for both the plan benefits and the plan contributions used to pay for those benefits. The pension fund of the plan is the accumulation of assets created from contributions and the investment earnings on those contributions, less any payments of benefits from the fund (Bodie et al, 2009).

Basically, there are two types of pension plans: Defined contribution (DC) and Defined benefit (DB) (McGill, 1984).

Defined Contribution Plans- In a defined contribution plan, a formula specifies contributions but not benefit payment. Contribution rules usually are specified as a predetermined fraction of salary (e.g, the employer contributes 15% of the employee's annual wages to the plan) (Bodie et al, 2009).

The pension fund consists of a set of individual investment accounts, one for each employee. Pension benefits are not specified, other than that at retirement the employee may apply that total accumulated value of contributions and earnings on those contributions to purchase an annuity (Klumpes and Whittington, 2003).

In principles, contributions could be invested in any security, although in practice most plans limit investment choices to bond, stocks and money market funds (for example in Nigeria, only less than 25% of pension fund is allowed to be invested in stock market). The employee bears all the investment risk, the retirement account is, by definition, fully funded by the contributions, and the employer has no legal obligation beyond making his periodic contributions (Frost and Hager, 1987, Barrow, 2008).

Defined Benefit Plan- In a defined plan, a formula specifies benefits but not the manner, including contributions, in which these benefits are funded. The benefit formula typically takes into account years of service for the employer and level of wages or salary (e,g, an employer might pay an employee for life, beginning at age 65, a yearly amount equal to 1% of his final annual wages for each year of service) (Bodie et al, 2009). The employer (called the plan sponsor) or an insurance company hired by the sponsor guarantees the benefits and thus absorbs the investment risk (McGill, 1984).

With defined benefit plans, there is an important distinction between the pension plan and the pension fund (Pike and Neale, 2006). The plan is the contractual agreement setting out the rights and obligations of all parties; the fund is a separate pool of assets set aside to provide collateral for the promised benefits. In defined contribution plans, by definition, the value of the benefits equals that of assets, so the plan is always fully funded. But in defined benefit plans, there is a continuum of possibilities. There may be no separate fund, in which case the

plan is said to be unfunded (McGill, 1984).

There are several types of defined contribution arrangements. For example, insurance-style DC plans such as those in Denmark and Switzerland aim to provide benefits akin to those defined benefit arrangements (BGL, 2020). *The key difference is that the "gyroscope" is within a DC fiscal envelope – reserves have to be maintained to smooth volatility risk over cohorts* (Lindeman, 2003). The employer's obligation is limited to making contributions as stipulated in the arrangement, and the employer is not responsible for correcting imbalances between assets and liabilities.

In other defined contribution regimes, contributors bear the investment risk more directly such as the case of Nigeria. In some countries, households can choose among providers, but the rules of the game are such that there is little or no effective portfolio choice – this occurs in the "Latin American" model now being used in the mandatory funded second tiers in Hungary, Poland and other EU accession countries (BGL, 2010). An even more constraining model is found in occupational DC arrangements in Australia, Spain and Italy, where households have no portfolio choice and volatility smoothing is generally not attempted. Because of portfolio uniformity, market volatility affects households as a whole – that is, there is not much heterogeneity among households (Lindeman, 2010).

The global shift toward defined contribution arrangements (of different types) has sharpened awareness of these risks among policy makers and citizens alike, especially in the wake of the 1990s bubble and the last three years of adjustment (Lindeman, 2003).

The overwhelming risk in retirement savings according to Lindeman (2003) is that asset values may fall below what is needed to pay pension promises or otherwise meet a household's retirement timing needs. There are numerous risk factors that might contribute to this shortfall risk. One key factor is investment risk, which is the risk that the financial vehicles in which pension fund assets have been invested may not provide anticipated investment returns. One important source of this risk is asset price volatility, which is defined as the fluctuation of asset values around expected values (the variance or standard deviation in statistical parlance) (Lindeman, 2003). This has made Pension funds, by their nature subject to potential conflicts of interest arising between the fund administrators and the ultimate beneficiaries of the fund (OECD, 2000). *Pension funds, therefore, require a set of internal statutes and external regulations to ensure that they are managed in the best interest of beneficiaries* (OECD, 2000).

Methodology

This study was carried out to investigate the critical factors that determine investment of pension fund, thus it adopted a survey research designed. All the staff of existing 24 PFAs in Nigeria formed the population of this study. The study used primary data, which were generated by the use of questionnaire. Respondents were selected from a sample of five PFAs in Nigeria using simple random technique. Sample size was calculated to be 123, which was arrived at by taking 25% of the population sample. However, a total of 125 questionnaires were administered on 18 items using likert scales. The likert scales were scored as follows: 4 = strongly agree (SA), 3 = Agree (A), 2 = disagree (DA), 1 = strongly disagree (SD). Data

collected were analyzed using factor analysis by principal component. Factor analysis was adopted for the purpose of partitioning of the experimental variable into factors that determine asset portfolio choice of pension funds in Nigeria. The following test instruments were used under factor analysis.

1. Kaiser-Mayer Olkin (KMO) and Bartlett's test. This is to test the appropriateness of the sample from the population and the suitability of factor analysis.
2. Communality.
3. Total variance explained (Eigen values).
4. Rotated component matrix.

Results and Discussion

Table 1: Descriptive Statistic

Descriptive Statistics

	N	Mean	Std. Deviation
Return on investment in PFAs facilitates further investment	125	3.97	.177
The inflationary rate in the economy affects the level of investment decision b the PFAs	125	3.10	.390
The income level in the economy determines investment decision by the PFAs	125	2.59	.610
The economic indicators such as per capital consumption influence investment decision in PFAs	125	2.23	.742
Interest rate is a determining factor in investment decision by PFA managers	125	3.26	.522
PFAs investment is based on high risk, high return	125	1.34	.706
PFA managers take into consideration risk elements in their investment decision	125	3.94	.231
Associated risk factor determines the level of investment decision by the PFAs	125	2.95	.437
Effective internal control and operations can help to determine the level of investment in PFAs	125	3.09	.312
Stringent government regulations affect investment decision by the PFAs	125	3.79	.408
Policy guidelines help to determine the conduct of PFAs in their investment decision	125	3.54	.501
Strong legal institution determines the level of investment risk taking by the PFAs	125	3.02	.347
The age of employees' is a determining factor in the investment decisions of PFAs	125	3.13	.538
Traditional beliefs can affect investment decision making in PFAs	125	1.24	.653
Investment decision by PFAs is determined by the level of security of properti	125	3.03	.380
Social insecurity affects the level of investment decision by PFAs	125	2.78	.552
Under-development of Nigerian capital market is a major challenge to investment decision making by PFA managers	125	3.14	.680
Pension funds are invested in long term assets	125	3.18	.498

Source: Field Survey, 2011

The descriptive statistics given in table 1, gives the mean and standard deviation of the sample population on each decision variable. The results shows evidence that return on investment and risk factors are rated higher than other variables that affect asset choice management of PFAs in Nigeria. This is indicated by 3.97, 3.94 in the mean value and 0.177 and 0.231 in the standard deviation as shown in table 1.

Table 2: Kaiser-Mayer-Olkin and Bartlett's Test of Sphericity

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.637
Bartlett's Test of Sphericity	Approx. Chi-Square	652.040
	df	153
	Sig.	.000

Source: Field Survey, 2011

From table 2 above, the Kaiser-Mayer-Olkin measure of sample adequacy gives a value of 0.637. The KMO is close to 1 which represents a perfectly adequate sample and bartlett's test shows a chi-square of 652.040 and a significance level of 1percent i.e .000 which is an indication of the adequacy of the sample. The results from the two test instruments show that factor analysis can be used for the study.

Table 3: Communalities

Communalities

	Initial	Extraction
Return on investment in PFAs facilitates further investment	1.000	.721
The inflationary rate in the economy affects the level of investment decision by PFAs	1.000	.617
The income level in the economy determines investment decision by the PFAs	1.000	.709
The economic indicators such as per capital consumption influence investment decision in PFAs	1.000	.704
Interest rate is a determining factor in investment decision by PFA managers	1.000	.639
PFAs investment is based on high risk, high return	1.000	.754
PFA managers take into consideration risk elements in their investment decision	1.000	.693
Associated risk factor determines the level of investment decision by the PFAs	1.000	.693
Effective internal control and operations can help to determine the level of investment in PFAs	1.000	.686
Stringent government regulations affect investment decision by the PFAs	1.000	.654
Policy guidelines help to determine the conduct of PFAs in their investment decision	1.000	.546
Strong legal institution determines the level of investment risk taking by the PFAs	1.000	.709
The age of employees' is a determining factor in the investment decisions of PFAs	1.000	.756
Traditional beliefs can affect investment decision making in PFAs	1.000	.833
Investment decision by PFAs is determined by the level of security of properties	1.000	.789
Social insecurity affects the level of investment decision by PFAs	1.000	.799
Under-development of Nigerian capital market is a major challenge to investment decision making by PFA managers	1.000	.616
Pension funds are invested in long term assets	1.000	.814

Extraction Method: Principal Component Analysis.

Source: Field Survey, 2011

Table 3 shows that the proportion of the variance of a variable is explained by common factor.

The values are approximately 1, indicating that the communality common factor extracted explained all the variance in the variables.

Table 4: Total Variance Explained

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.172	28.733	28.733	5.172	28.733	28.733
2	3.823	21.239	49.972	3.823	21.239	49.972
3	2.821	15.672	65.644	2.821	15.672	65.644
4	1.218	6.767	72.412			
5	1.164	6.467	78.878			
6	.763	4.239	83.117			
7	.676	3.757	86.874			
8	.544	3.022	89.896			
9	.407	2.261	92.157			
10	.295	1.639	93.796			
11	.212	1.178	94.974			
12	.195	1.083	96.057			
13	.156	.867	96.924			
14	.114	.633	97.557			
15	.102	.567	98.124			
16	.085	.472	98.485			
17	.059	.328	98.718			
18	.036	.201	100.000			

Extraction Method: Principal Component Analysis.

Source: Field Survey, 2011

The Eigen value of the factors is contained in table 4 above. The result shows that a maximum of three factors could be obtained, because the three initial Eigen values in column 2 is greater or equal to 1 and their extraction sums of squared loadings is also greater than 1.The general rule of factor analysis stipulates that only factor with Eigen value of 1 and above are considered meaningful for interpretation (Anthony and Mustapha, 2010).

Factor 1 has the highest extraction sum of square loading of 5.172, representing 28.73 percent of variation. And factor 3 has the least extraction sum of square loading of 2.821, representing 15.67 percent of our variation. This result shows that no factor is considered redundant. The extraction sums of square loadings of other factors are between the ranges 5.172 and 0.036. Also, the contributing power of the factors to the explanation of the variance in the variables is considered very significant.

Table 5: Factor Matrix

Component Matrix[a]

	Component		
	1	2	3
The economic indicators such as per capital consumption influence investment decision in PFAs	.718	.218	-.345
PFAs investment is based on high risk, high return	.717	-.335	.304
Traditional beliefs can affect investment decision making in PFAs	.703	-.270	.348
Pension funds are invested in long term assets	.518	.030	.068
Effective internal control and operations can help to determine the level of investment in PFAs	.421	.301	.042
Interest rate is a determining factor in investment decision by PFA managers	.296	-.293	.221
Under-development of Nigerian capital market is a major challenge to investment decision making by PFA managers	-.297	.650	.215
Social insecurity affects the level of investment decision by PFAs	-.232	.607	.226
Strong legal institution determines the level of investment risk taking by the PFAs	.374	.576	-.264
Investment decision by PFAs is determined by the level of security of properties	.193	.574	.479
Stringent government regulations affect investment decision by the PFAs	-.502	.503	-.046
The inflationary rate in the economy affects the level of investment decision by the PFAs	.312	.449	-.447
Policy guidelines help to determine the conduct of PFAs in their investment decision	.094	.194	.153
The income level in the economy determines investment decision by the PFAs	.420	.469	-.507
The age of employees' is a determining factor in the investment decisions of PFAs	.282	.417	.488
PFA managers take into consideration risk elements in their investment decision	-.320	.171	.413
Return on investment in PFAs facilitates further investment	-.114	-.110	-.279
Associated risk factor determines the level of investment decision by the PFAs	.257	.184	.263

Extraction Method: Principal Component Analysis.

a. 3 components extracted.

Source: Field Survey, 2011

The examination of table 5 of loading indicates the following observations:

Factor 1

Variables 1, 2, 3, and 4, load heavily on factor 1 which accounts for about 28.73% of the total variance explained.

Factor 2

Variables 7, 8, 9, 10, and 11, load heavily on factor 2, which accounts for 21.24% of the total variance explained.

Factor 3

Variables 10, 15 and 16 correlate moderately with factor 3, and that account for 15.67% of the total variance explained. Summary of the factors and their corresponding percentages of total variance explained are given below:

Factor 1
28.73%
Factor 2
21.24%
Factor 3
15.67%
Total
65.64%

Table 6: Rotated Factor Matrix

Rotated Component Matrix[a]

	Component		
	1	2	3
PFAs investment is based on high risk, high return	.821	.068	.201
Traditional beliefs can affect investment decision making in PFAs	.782	.066	.270
Stringent government regulations affect investment decision by the PFAs	-.696	-.012	.149
Under-development of Nigerian capital market is a major challenge to investment decision making by PFA managers	-.566	.025	.486
Social insecurity affects the level of investment decision by PFAs	-.488	.035	.483
Interest rate is a determining factor in investment decision by PFA managers	.454	-.110	.060
Pension funds are invested in long term assets	.394	.283	.198
The income level in the economy determines investment decision by the PFAs	-.082	.804	.010
The economic indicators such as per capital consumption influence investment decision in PFAs	.335	.753	.052
The inflationary rate in the economy affects the level of investment decision by the PFAs	-.138	.692	.016
Strong legal institution determines the level of investment risk taking by the PFAs	-.123	.682	.246
Effective internal control and operations can help to determine the level of investment in PFAs	.150	.380	.320
PFA managers take into consideration risk elements in their investment decision	-.249	-.357	.336
Investment decision by PFAs is determined by the level of security of properties	-.084	.116	.758
The age of employees' is a determining factor in the investment decisions of PFAs	.080	.083	.691
Associated risk factor determines the level of investment decision by the PFAs	.148	.087	.374
Return on investment in PFAs facilitates further investment	-.087	.047	-.305
Policy guidelines help to determine the conduct of PFAs in their investment decision	-.009	.062	.257

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 4 iterations.

Source: Field Survey, 2011

Table 6 gives the rotated component factor matrices. The result in table 6 revealed that rotation has made factor loadings more meaningful and interpretable, because it reduces the number of variables that have high loading on any given factor. This makes it easy to identify each variable to a single factor. However, it is important to note that only loadings greater than 0.5 were considered significant after varimax rotation in this research.

Factor 1

Two items had significant loading on factor 1 after varimax rotation, and they can be interpreted as risk factor. These include:

1. PFA investment is based on high risk, high return
2. Traditional beliefs can affect investment decision making in PFAs

Factor 2

A total of four variables loaded heavily under factor 2, and they can be interpreted as economic factor. These include:

1. The income level in the economy determines investment decision by the PFAs.
2. The economic indicators such as per capital consumption influence investment decision in PFAs.
3. The inflationary rate in the economy affects the level of investment decision by the PFAs.
4. Strong legal institution determines the level of investment risk taking by the PFAs.

Factor 3

Only two variables loaded heavily on factor 3, and this can be interpreted as security of real estate factor. These include:

1. Investment decision in PFAs is determined by the level of security of real estate properties.
2. The age of employee is a determining factor in the investment decision of PFAs.

The result of the study indicates that all the eighteen variables for the research were identified by PFA workers as possible factors that influence their investment decision.

Conclusion and Recommendations

The objective of this research was to identify the determining factors of pension fund investment. From the factor extraction, three factors were identified, however the most critical determinant factor in the investment of pension fund is risk factor, this accounts for 28.73% of determinants of investment of pension fund. It can therefore, be inferred from this study that variables such as interest rate, internal control system etc, are not critical in determining investment of pension funds in Nigeria.

According to Njuguna (2010), the nature of pension funds exposes them to different aspects of risk- key amongst these risks is default risk from employers and employees, stock market risk, operational risks, liquidity risks etc. Although some of the underlying philosophy of Pension Reform Act (see PRA, 2004), ranging from individual choice of PFA by the employees, separation of the role of custody from investment management, establishment of statutory reserve, limitations on investment etc, address some of the risk management issues, Pension Fund Managers need to come up with a risk management policy. On this, three components need to be considered: Firstly, they should define an acceptable level of risk tolerance. Secondly, they should develop good systems of mitigating on the enormous risks they face in their duty as investment managers. And thirdly, they should maintain a fair balance between returns on investment and the pension risks i.e they should ensure that all investment decisions are made in the best interest of their contributors.

This is because pension fund risk management is important since risk tends to reduce the returns on investment over the long run, creates uncertainty about the value of pension assets when pension liabilities become due and raises questions that impact on the governance

aspect of pension funds when irregularities and market volatility lead to losses in the pension funds (Maurer et al, in Njuguna, 2010).

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