

IMPACT OF LIFE ANNUITY AS PAYMENT OPTION ON NIGERIAN PENSION FUNDS

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ABSTRACT

The contributory pension scheme (CPS) ushered in 2004 a new generation of pension management in Nigeria. This scheme came forward with three options for the retiree to choose as to how he wants his/her pension funds to be paid according to PRA 2014. The options are lumpsum, programmed withdrawals and life annuity. However, the impact of selecting life annuity that provides protection against longevity risk is what has not been investigated in Nigeria. Using pension fund contribution and the explanatory variables. The study utilized the Smart Partial Least Squares (PLS) using time series data for sampled Pension Fund Administrators (PFAs). Results revealed that the coefficient of life annuity significantly affects the pension funds contributions. This suggests withdrawal from the scheme is continuous until the retiree dies. Therefore, Leaving no precise exist boundary and as such making the fund volatile. The paper recommends PFAs should increase their investment in risky assets to give them the opportunity of reaping more returns on pension contribution. It further recommends appropriate investment portfolio mix on behalf of retirees to hedge against risk of eroding the long-term funds since life annuities cannot be bequested.

KEYWORDS: *Life annuity, Pension Fund & Nigeria.*

1. INTRODUCTION

Evidently, pension funds stabilize the financial system of a number of economies. In order to give the employee a sound retirement life, many economies migrated from the Defined Benefit (DB) to Defined Contributory (DC) pension system to enable governments manage their pension liabilities (Doyle, 2006). Nigeria successfully shifted to the DC in 2004 as a result of the outstanding pension liabilities against the Nigerian government in the DB scheme and as at 2015 and 2017 contributions amounted to 5.3 and 7.52 trillion naira respectively (National Pension Commission, 2017). In the DC scheme arrangement retirees have the option of selecting either programmed withdrawals or life annuity after the payment of an initial lump sum as stipulated by the Pension Reform Act 2014 (Sambo, 2018). The Pension Reform Act (PRA) 2004, which was amended in 2014 is the main legislation guiding the operation of the DC scheme. The Nigerian pension industry under the new DC pension plan experienced its major challenge in 2008 when the Nigerian stock market witnessed substantial erosion in the value of both individual and institutional shareholders. The deterioration in the value of stock led to market loss of about 44.38 percent of its capitalization and the Nigerian Stock Exchange (NSE) All Share Index (ASI) declined by approximately 68.62 percent (Reichling and Smetters, 2015). Furthermore, based on the Nigerian institutional framework the PRA 2014 is the policy document that guides the industry. Previous studies such as Mitchell (2001) and Antolin (2008), have identified lump sum, programmed Withdrawals and life annuities. They opined that the entire accumulated retirement fund is paid at once for countries like Hong Kong, India, Philippines and Thailand (Provident funds). Similarly, other countries such as Australia, Belgium, China,

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Indonesia, Japan, Malaysia, New Zealand, and South Africa, allow lump sum along other payment options at retirement is obtainable.

For retirees, the impact of their final retirement benefit is not a function of the terms under which government offers the rescue package but that of his/her accumulated contributions during their working life and the investment performance of the Pension fund Administrator (PFAs). For instance, injections into the fund seizes once the employee's retirees and it is from working life pension contributions that he/she is expected to make a decision that would sustain the retirement payment. However, life annuity unlike programmed withdrawal in Nigeria cannot be bequested but it is handy as it will lower the risk of financial distress since the retiree receives payment until his/her death. On the other hand, payment stops for a retiree that opts for programmed withdrawals once his/her work life pension contribution is exhausted. However, programmed withdrawals is offered by PFAs and the are the managers of the fund a according to the policy document. The prospective retiree may tilt to selecting this option at retirement without the awareness of other options that may be beneficial to them during payout since retiree is allowed to contribute in the investment of his/her fund. It is equally fundamental to understand how payout options effect the pension funds because according to Antolin (2008) three options are basically available in the payout phase but how and when to buy it depends on countries' legislation and availability of annuity market that would serve this need for retirees. However, there is no known published study on the impact of pay out options in Nigeria to serve this purpose. The paper states the hypothesis as follows;

H0₁: Life annuities has no significant impact on pension funds in Nigeria.

Finally, the findings of this study would enlighten retiree on the implication of the purchase of life annuity with their pension funds Similarly, insurance companies listed on the market would also be exposed to the effect of annuity purchase by retirees in Nigeria. The remainder of the paper is structured as follows: section two reviews literature and presents the theoretical framework underpinning the study, section three discusses the methodology adopted for the study, section four presents the results/findings, section five discusses the findings; and section six draws conclusions and makes recommendations.

2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1. Concept of Pension fund

According to Sambo (2019), pension funding is meant to cater for the older generation and it provide long term funds that injects money to the financial system of any economy. Below is a table 1 shows the Nigerian pension contributions from 2017 to 2018.

Table 1. Annual Pension Contributions in Nigeria (2007-2018)

Year	Public Sector	Private Sector	Total Contributions
2007	N80.63 Billion	N68.34 Billion	N148.97 Billion
2008	N99.28 Billion	N80.81 Billion	N180.09 Billion
2009	N137.10 Billion	N91.21 Billion	N228.31 Billion
2010	N162.46 Billion	N103.03 Billion	N265.49 Billion
2011	N228.92 Billion	N119.53 Billion	N348.45 Billion
2012	N331.14 Billion	N174.43 Billion	N505.57 Billion
2013	N278.50 Billion	N225.42 Billion	N503.92 Billion
2014	N237.76 Billion	N343.97 Billion	N581.73 Billion
2015	N200.05 Billion	N358.91 Billion	N558.96 Billion
2016	N225.86 Billion	N262.33 Billion	N488.20 Billion
2017	N257.11 Billion	N353.77 Billion	N610.88 Billion
2018	N266.84 Billion	N339.39 Billion	N606.23 Billion

Source: National Pension Commission (2018). Pension industry report: First quarter 2018. Abuja: Author

It is evident from the table that both the public and private sector made contributions to the fund fund in Nigeria for the period 2007 to 2018. Although pension contributions started in 2004 investment to generate higher returns to accommodate the payout phase only began in 2007 (National Pension Commission, 2007). Thus, from the table above it can be seen that aggregate pension increased steadily from 2007 with 148.97 billion to 558,96 billion in 2015. Contrary to this in 2016 aggregate total pension contributions witnessed a sudden decline to 488.20 billion after which the industry contributions shoot up to 610.88 billion than a slight decrease to 606.23 in 2018. This volatilities in aggregate pension contribution from 2015 may be as a result of the change in policy document to PRA 2014.

2.2. Concept of Annuities

The ancient Roman contracts known as annua promised for an up front payment fixed term, or possibly for life a stream of payment to an individual brought to the fore the idea of annuities Poterba (2001) The income received from an annuity by a retired investor is considered taxable income and paid by an annuity or insurance company Poterba et al., (1999) and Walker (2006) argued that annuities are sometimes referred to as “reserve life insurance.” With life insurance; the policy holder pays the insurer each year until he/she dies after which the insurance company pays a lump sum to the insured’s beneficiaries. With annuities, the lump sum payment is from the annuities to the insurance company before the annuity payment begins and the annuitant receives regular payouts from the insurance until death.

Annuities stabilizes volatilities of earning during retirement and aid in consumption planning. An annuitant is assured of receiving a constant income stream for the remainder of his life. The annuity provider can pool mortality risk across similar individuals and by so doing can use the principal left behind by those who died sooner than expected to insure those who live unexpectedly long (Sambo, 2012b; Jousten, 2001). As a result, the annuitant’s payout from the annuity contract can, in theory, exceed the income he could earn if he invested his annuity premium in a financial asset such as a bond.

According to Poterba (2001) and Brown and Warshawsky, (2013) annuities are a form of reversed life insurance. A life insurance policy holder pays the insurer each year until he or she dies. When the insured individual dies, the insurance company pays a lump sum to the beneficiaries of the life insurance policy. With annuities, the annuitant makes a lump-sum payment to the insurance company before the annuity payout begins. In return, the insurance company makes payment to the annuitant until the annuitant’s death.

Similarly, Milevsky, (2013) argued that life annuities by contrast fully protect individuals from longevity risk, but in their plain forms are inflexible and illiquid and do not allow for bequest. Nevertheless, more complex annuity products are available which are designed to satisfy the need for flexibility and, in particular, the bequest motive. Combining arrangement of these options may achieve both goals of flexibility and protection from longevity risk.

2.3. Review of related Literature

This section is dedicated to the review of previous literature on annuities and pension funds. Most of the studies on annuities come from the U.S.A, U.K., and other countries such as Chile, Hungary and Australia, this is because their pension systems are more established (Milevsky, 2003).

Chen et al., (2019) argued that annuities and tontines being retirement products provide a hedge against risk but tontines although cheaper do not provide stable payments to policyholders. They introduced products such as tontuity and antine with the aim of finding the optimal combination of retirement portfolio. Result revealed that optimal combination may be positive, pure annuities or pure tontines based on the premium loadings in the investment portfolio. However, these may take time before it can be offered in emerging economies that are trying to understand annuities.

Wu et al., (2017) conducted a study on optimal portfolio choice with health contingent income products. They argued using life cycle model that life annuities improve welfare and reduce expenses. This notwithstanding the differences in each institutional setting. The study concluded that the purchase of life annuities by retiree has positive impact on the welfare of the retiree and eases the burden of exhaustion of the pension fund at retirement.

Sambo, (2012a). Utilized Nigerian data to investigate the extent to which stakeholders in the pension industry perceive annuities in financing retirement in Nigeria. The study found that the awareness of annuities plays an important role in the choice of annuitization option at retirement and recommends publicity of annuities in Nigeria and the development of annuity market where a variety of annuity product will be made available to Nigerian retirees. This will allow the retiree the ability to hedge against risk of eroding his/her long-term fund in the Nigerian institutional setting. However, the study utilized survey because of lack of enough secondary data.

Davidoff et. al., (2005) try to advance annuity demand theory with that used by Yaari 1965. The study found lack of voluntary annuitization as puzzling and attributed it to behavioral differences and recommends modeling of annuity demand such that annuity asset can be brought to the fore. However, the study was conducted almost fifteen years ago and as such could be studied again.

Poterba (2001) conducted an international comparison of developed annuity markets using USA and UK data. He investigated the importance of annuity markets in providing retirement security. However, voluntary annuity markets are characterized by adverse selection. He advocated for the introduction of compulsory annuitization such that retiree attains safe haven for his/her funds when retirement comes there by reducing adverse selection. Time has vindicated the findings of this study. However, individuals are not exposed to the intricacies of life annuity.

Milevsky and Young, (2007) they conducted a study using Chilean data using a panel of life insurance companies to establish the determinant of annuity rate and concluded the need to match supply and demand of pension annuities. Results revealed the need for financial instrument to encourage competition and higher returns. However, time has vindicated the findings of this study. Dissimilar to stock markets, annuities offer a definite limit that makes them moderately less risky. Though the model houses the principal feature and structure of actual annuities that are available, the mere presence of actuarial values in a continuous-time model would continue to change over time.

Doyle (2006) conducted a study using Australian data and examined the payout phase of a defined contributory retirement income arrangement. The study found out that an annuity allows the retiree to behave as predicted by the life cycle hypothesis of consumption and savings. The study concluded that Australian annuities provide reasonable value compared to those available in the international market. However, individual is responsible for managing these risks, which is difficult for the average retiree.

Similarly, Antolin et al (2008) examined the various forms of retirement benefit payment allowed in countries all over the world with specific emphasis on Brazil, Canada, Chile, Hungary and the United Kingdom. They also found that lumpsums and programmed withdrawals are generally provided by pension funds, while for annuities; providers varied from insurance companies to pension funds, financial intermediaries and a centralized annuity fund. However, the findings of the study may be country specific to differences in policies.

Antolin (2008) assessed how countries' pension arrangement addressed questions concerning the types of retirement pay out options for accumulated assets under the DC plan a country should allow, which entities should provide annuities, and the type of annuity products that could be allowed. However, the study lacks any tangible explanation on the guideline process of the payout phase, He stated that the outcome of each country's experiences may later be turned into policies.

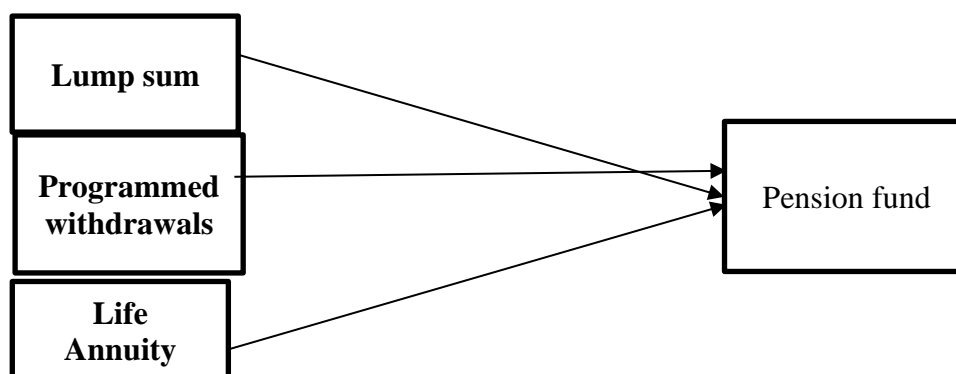


Figure 1. Retirement payout options

Source: Pension Reform Act, (2014)

The three payment options are allowed by the PRA, 2014 for the Nigeria retiree to draw down their contributed pension fund. It is worth to note that, lumpsum and programmed Withdrawals are flexible with easier liquidity but does not hedge against longevity risk and both can be bequested while life annuities are not bequested nor it is flexible but hedge against the risk of longevity (Sambo, 2012a: Doyle, 2006).

2.4. Theoretical Frame Work

The simple model of lifecycle saving and consumption assumes that there is no uncertainty, Yaari (1965) was the first to demonstrate the economic value of annuitisation in a lifecycle model with uncertain lifetimes, and this framework has been used extensively to value the insurance value of annuities. While the introducción of uncertainty to the LCH makes the model more complex, the findings remain consistent with the original findings by Modigliani and Brumberg (1954) that there is a fall in the stock of wealth over the retirement period, which is a requirement of the LCH (Hurd, 1990).

However, consumption might not be smooth between pre and post retirement or within the retirement period in most cases annuitization provides the best means of savings for retirement. This, according to him, is especially expedient for a society that has no social security. The study adopts this theory because it provides justification for annuitization in a society with a robust pension system. Given the volatility of the Nigerian investment environment in which most pension funds are invested, the need for an alternative source of income becomes ineludible.

3. METHODOLOGY

This paper applied the Smart Partial Least Squares (PLS) to establish the relationship between the variables. The population of this study consists of all PFAs registered and recognized by the National Pension Commission as at 31st December, 2018. There are twenty-one PFAs and seven CPFAs registered during the period in Nigeria but this study is explicit to twenty-one firm observations as it does not include the CPFAs. The study thus utilized an aggregate data for the PFAs payout. Therefore, generalizations proffered covers the whole industry status in Nigeria.

The data was collected from audited and published annual reports of the PFAs on annual payouts, while information on annual pension fund were collected from the relevant pension annual report for the period for the analysis. This model explains pension fund contribution as a function of the

following factors: life annuity captured by β (LFANT), public sector contribution, private sector contribution and pension assets captured by β (PUCTR, PRCTR AND PENASST). It considers factors such as GDP, and Annual growth rate as control variables. To capture such differences, this study estimates the following equation;

$$\begin{aligned}
 \text{PENCONTR}_{it} = & \beta_0 + \beta_1 (\text{LFANT})_{it} + \beta_2 (\text{PUCTR})_{it} + \beta_3 (\text{PRCTR})_{it} + \beta_4 (\text{PENASST})_{it} + \beta_5 \\
 \text{CONTRL} & (\text{GDP, ANGRT})_{it} + \epsilon_{it} \dots \dots \dots (1)
 \end{aligned}$$

4. RESULTS DISCUSSION/FINDINGS

After conducting a comprehensive literature review, the authors suggested a model and examined it using structural equation model (SEM) PLS approach. In addition, annual report of National Pension Commission (2017) was used to determine the variable of the study from 2007 to 2018. Smart PLS software was used for structural equation modelling analysis.

The model explains life annuity as a function of the following factors: public sector contribution, private sector contribution and pension assets. It considers factors such as a deferred annuity contract as an insurance contract purchased today that will provide annual (or more periodic) payments over the life of an individual or some other fixed period of time beginning at some future date. Earnings within the annuity contract grow on a tax-deferred basis, and can later be converted into a steady stream of income. This favorable tax treatment that defers income tax liability, from the growth phase to the income payment phase, has encouraged the use of annuities as a retirement savings vehicle.

This explains why economic agents might decide against nonqualified deferred annuity contracts: annuitant-driven contracts and owner-driven contracts. In addition, the others factor that determine the annuity like annual growth rate are more difficult factors to identify than strictly economic factors, like GDP but they also play an important role in life annuity for the pension fund contribution. The following testable hypotheses are derived from the model:

Hypothesis 1. An increase in life annuity has an effect on the level of pension fund contribution in Nigeria.

Base on the hypothesis above the path model and the structural model are presented in figure1 and 2 below:

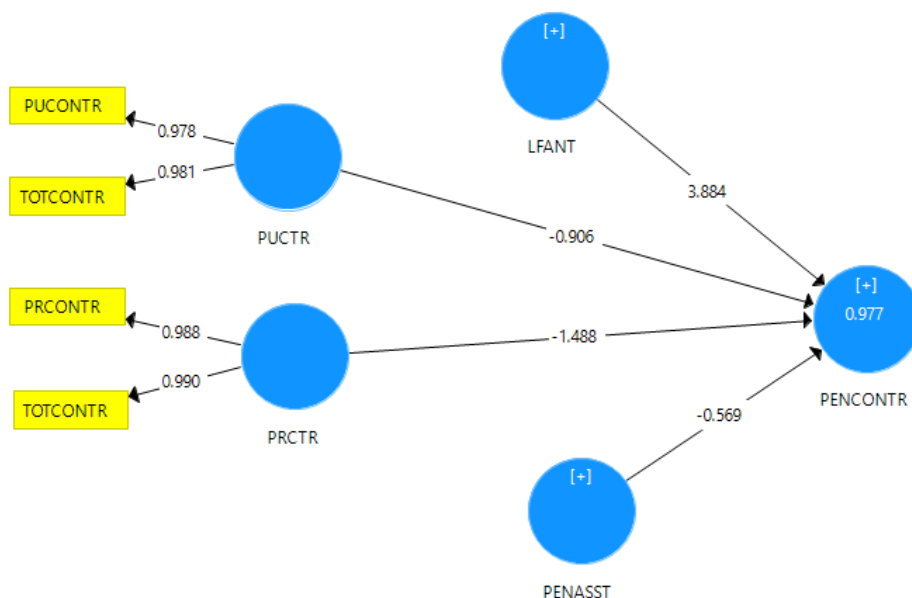


Figure 1. 0 Path Model for the study

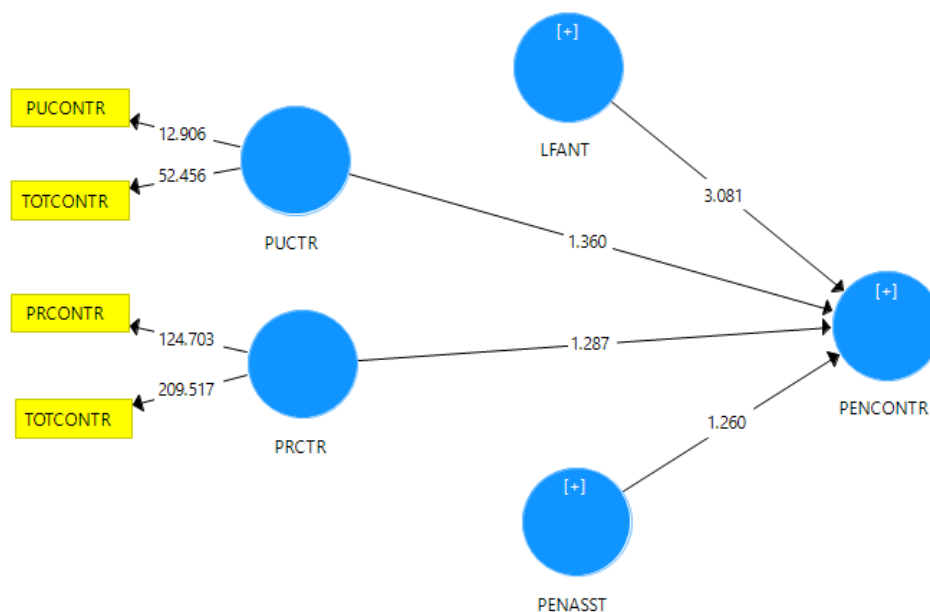


Figure 2. Bootstrapping Result for the model

This model explains pension fund contribution as a function of the following factors: life annuity captured by β (LFANT), public sector contribution, private sector contribution and pension assets captured by β (PUCTR, PRCTR AND PENASST). It considers factors such as GDP, and Annual growth rate as control variables. To capture such differences, this study estimates the following equation;

$$PENCONTR_{it} = \beta_0 + \beta_1 (LFANT)_{it} + \beta_2 (PUCTR)_{it} + \beta_3 (PRCTR)_{it} + \beta_4 (PENASST)_{it} + \beta_5 CONTRL (GDP, ANGRT)_{it} + \epsilon_{it}$$

Table 1. R Square of the model

R Square		
	R Square	R Square Adjusted
PENCONT	0.977	0.963

Table 1 show the value of the R2 which stood at 0.977 and the adjusted R2 value of .963. This show that the model is 97%, as the life annuity for the period under consideration predict the pension contribution.

Table 2. Bootstrapping result for the model

Mean, STDEV, T-Values, P-Values					
	Original Sample	Sample Mean (M)	Standard	T Statistics	P Values
LFANT -> PENCONTR	3.884	0.295	1.261	3.081	0.002
PENASST -> PENCONTR	-0.569	-0.602	0.452	1.260	0.208
PRCTR -> PENCONTR	-1.488	0.709	1.157	1.287	0.199
PUCTR -> PENCONTR	-0.906	0.555	0.666	1.360	0.174

Table 2 show the beta total effect of the variables in the study, life annuity has a (beta value of 3.884 and a t-statistics value of 3.081 and significant at $P < 0.01$). This indicate the that the hypothesis was supported, hence life annuity has a positive and significant effect on the pension fund contribution in Nigeria. While all others variable show the negative significant effect to the pension fund contribution under study.

In this paper, the model shows the pension fund management and the optimal investment and benefit payments policies for the public and private pension fund with an income drawdown option are presented explicitly. Further the study revealed how the pension fund management should invest the fund wealth in riskless and risky assets. Because the goal of the pension fund management is to maintain the standard of lives for the pension fund members after retirement. This result support the earlier submission by Mwanakatwe et al. 2019 who suggest that pension fund managers are advised to control the investment and the benefit payments policies to achieve the goals of the pension fund members. Furthermore , Wu, Bateman, and Stevers, (2017) argued that life annuities improves welfare and lessens expenses.

5. CONCLUSION AND RECOMMENDATIONS

The study concludes that the decisions on payout options that should be allowed by policy makers on the decumulation (payout) of these funds is country specific. Government priorities, the type of pension scheme and the availability of other sources of wealth available at retirement among other can affect the payment process. This paper further concludes that life annuity has a positive and significant effect on the pension fund contribution in Nigeria. Thus, unlike programmed withdrawals where the pension fund is exhausted and payment stops to the retiree with life annuity payment is continuous to the retiree until he/she dies. Therefore. Leaving no precise exist boundary and as such making the fund volatile. The paper recommends PFAs should increase their investment in risky assets to give them the opportunity of reaping more returns on pension contribution. It further recommends appropriate investment portfolio mix on behalf of retirees to hedge against risk of eroding the long-term funds since life annuities cannot be bequested.

The lack of government-financed social security system in Nigeria makes purchasing an annuity is the best option to a retiree as it will guarantee him/her a continuous flow of income. The paper is a pioneering one in the area of life annuity in Nigeria and it is important because PFAs are the providers of programmed Withdrawals and will no doubt market their products to the retiree. Thus, the paper suggests for further study investigación of all three option on the pension fund. But for the availability on data this study would have done that.

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