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Options for Retirement Benefit Payout under the Nigerian Pension Reform Act of 2014: Which is better between Annuity and Programmed Withdrawal

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Abstract

This study investigates the most appropriate payout methods for retirees at the time of retirement that will enable potential retirees to live a life of luxury and comfort after they leave service. The aim of this paper refers to study the actuarial fundamental rules in practice and assumptions, as well as a framework of research methods and techniques to calculate the two payout options specified in the 2014 Pension Act. Moreover, the particular point is paid an attention to look into detail about the basis of potential retirees' accumulated retirement contributions in their retirement saving accounts, as well as data on retirees from Nigerian academic federal university staff who are entitled to monthly benefits in addition to lump sum payments when they retire. The findings show that purchasing an annuity is preferable to a programmed withdrawal on a set schedule. As a result, employees may consider obtaining an annuity to benefit from long-term income flow for better living conditions in old age as well as to safeguard their retirement assets from outliving them.

Keyword: Pension, Programmed-withdrawal, Annuity, Contributory-pension, Retirement

Introduction

Retirement is seen as a critical phase of life in human development all around the world. As a result, a wise and reasonable person needs to make a lot of decisions before and when retiring from service (Sogunro, Adeleke, & Ayorinde, 2019). When to leave active employment or occupation; how much to spend in retirement; and when to begin drawing earned retirement benefits are just a few of the considerations that must be made. If they have a pension, they must make some long-term pension decisions, such as whether to accept a lump sum, an annuity, or programme withdrawal, and what term to choose, such as benefits for their life only, or benefits that provide an on-going benefit for their spouse if they should die young.

The growing number of pension policymakers' experiences with the challenges faced by potential retirees approaching and entering retirement (including Nigeria), as well as the active debate over the most appropriate forms of benefit payment options at the retirement of the growing defined contribution pension plan, is leading to a major shift in focus away from accumulation and retirement savings and toward payout options. Most people approaching retirement today are unsure of how they will manage their retirement assets in order to convert their retirement contributions into retirement income due to the challenges. In 2014, the Nigerian government suggested reforms to the 2004 Pension Acts, including a redesign of the retiree contribution payment phase options, in response to some of these difficulties. The reform liberalizes the payout phase by allowing members to cash out their pension savings by paying up to 50% of the total benefit contributed in their retirement savings account in a cash lump payment, with the remaining benefits paid out throughout the rest of the member's life in the form of a pension (Nigeria Pension Act, 2014). As stipulated by Section 7 of the Nigeria 2014 Pension Reform Act, the contributory pension scheme has two major modes of withdrawal: programmed monthly or quarterly withdrawals calculated on the basis of an expected lifespan and a life annuity purchased from an insurance company licensed by the National Insurance Commission with monthly or quarterly payments (Pension Act, 2014). The Act expressly allows potential retirees to select between the two methods of withdrawal from the retirement savings account indicated above.

In retrospect, the pension reform announced in December 2014 by the Nigerian government left many retirees with no choice but to live in abject poverty because the best payout options that suit their diverse consumption habits and lifestyles are unavailable. They can only choose between purchasing a life annuity and programming withdrawal according to the 2014 Nigerian Pension Reform Act. The Nigerian pension policy-makers did not introduce great innovations, but basically applied the content of the previous reforms more rapidly and more strictly. They have failed to create an environment that allows retirees to enjoy their golden years. As mandated by the 2014 Pension Reform Act, policymakers have not assessed an appropriate retirement benefit

option, nor have they adequately examined and evaluated how the benefit option style and strategy affect the success of pension schemes in general.

Background of Study

Nigerian pension policymakers did not know that having a strong retirement contribution payout option strategy is more complex than simply having good savings of pension contributions and making them last to ensure income for life. Indeed, the vast majority of pension policymakers are ignorant of how critical it is to grasp the relationship between retirement benefit contributions, retirement income, and retirement goals, and how difficult it can be to do so. Pension policymakers were unaware that living longer in an environment of low-interest rates and high inflation could culminate in a gap between what their current savings can generate and the retirement income they expect. There are simply too many uncertainties, including how long the money must last. Will potential retirees outlast their savings? This is a question that pension policymakers should consider. Do they have enough income to survive market downturns and life's unforeseen twists and turns? How long will they be able to live off their savings? Will they be able to maintain their financial independence or will they need to rely on family support? As well as whether they will be able to maintain their way of life?

In addition, while proposing the new 2014 Nigerian pension Act, the pension policymakers did focus on the phase of retirement payout alternatives because the number of retirees is initially modest and older workers are frequently barred from entering the new plans. Their focus has been on ensuring that the contributions phase is properly regulated and protected, as well as ensuring that the system is administratively efficient, which is critical when dealing with so many modest accounts of potential retirees. The policymakers failed to realize that the retirement payment options phase is just as important if the new pension systems are to achieve their goal of providing efficient and effective retirement incomes. They failed to realize that the success of a new pension system depends on its ability to use whatever capital has accumulated at the end of covered workers' active lives to provide a reasonably sufficient regular income to them and their dependents. To avoid beneficiaries making decisions that lock them into a substandard pension payout for the rest of their retirement, pension policymakers must effectively plan the transition to the retirement payment options phase. Furthermore, Nigeria's numerous schools of thought, specialists, and fund managers have not reported clearly on the best retirement benefit options that can afford to offer potential retirees the same standard of living they had before retirement.

Objective of study

Due to two factors, potential retirees in Nigeria who have vested in a defined contribution pension plan confront a difficult decision when it comes to determining which pension payout type is appropriate for them. A potential retiree's pension payment is, first and foremost, an important part of their retirement income strategy. Second, once potential retirees have made their choice, it is irreversible (Dechtman, 2020). The difficulty in determining which pension payout option to choose is related to the fact that pension payout alternatives are rarely easy and can have far-reaching consequences for potential

retirees and their families. Furthermore, there have historically been few effective solutions to the problem of payment options, leaving retirees to fend for themselves in terms of long-term financial security. This is one of the variables that contribute to the global retirement savings gap.

In addition, because payout options are designed to be actuarially identical, the potential retiree's decision to choose one over the other is influenced by other factors such as life expectancy and the need to provide benefits to survivors (Antolin, Pugh & Stewart, 2008). Potential retirees should make this option based on their financial plan, which should consider a number of important criteria, including their age and that of their spouse, the retiree's and spouse's health and life expectancy, their dependents, and their financial demands. Potential retirees must evaluate various considerations that may apply to their personal situation, as well as how they desire to provide for others, such as their family and financial situation, income needs, and future ambitions. As a result, it's crucial for potential retirees to grasp the features and benefits of the many payout options and plan options, as well as which one would best meet their family's needs.

Thus, the study's goal is to address potential retirees' indecision when it comes to choosing the best options for receiving their retirement income, as well as to educate them on the best option for their retirement income among the two pension retirement payout options stipulated in Nigeria's 2014 Pension Act (that is, monthly annuity and monthly programmed withdrawal) by analyzing the differences between the options and determining which is the best option for them. The study also addresses potential retirees' indecision, making it much easier for their pension fund administrators to persuade them to adopt a plan that benefits the administrator rather than the retiree, and relieving the government of the burden of worrying about retirees because they will be earning retirement benefits commensurate with their contributions and standard of living. However, the scope of the study was limited to the breadth of pension financial data and information on work-related sources of income gathered primarily from the retirement savings account balances of the retirees, which were supposed to be easily available through pension fund administrators. As a result, only active employees with a complete financial plan and a strong investment strategy were considered for evaluation.

LITERATURE REVIEW

Life-Cycle Hypothesis

In the early 1950s, economists Franco Modigliani and his student Richard Brumberg established the Life-Cycle Hypothesis, which deals with people's spending and saving behaviors throughout the course of their lives (Browning, M., & Lusardi, A., 1996). The theory explained that individuals plan their consumption and savings behavior during their

lifespan, according to the idea, and want to level out their consumption in the best feasible way by accumulating when they earn and dis-saving when they retire. The theory's central assumption is that all people choose to live stable lifestyles, avoiding saving a lot in one era to spend a lot in the next, and keeping their consumption levels roughly the same in each period. The Life-Cycle hypothesis outlines the three stages of development of pension fund administrators, as well as their financial requirements, and assumes that there is no uncertainty about the rate of return on assets, inflation, or the date of death. For example, if a retiree knew how long he or she would live, determining the optimal withdrawal of money throughout the retirement period would be simple.

Conceptual Framework

The conceptual framework in figure 1 below depicts a network of interconnected concepts that allows for a comprehensive understanding of the study under investigation. It is used to illustrate the study's design by giving an analytical structure that concisely describes the investigation's direction as well as the interplay between the several variables being evaluated in the study. To meet the study's goal, information on the 2014 Pension Act's specified contributions and payment possibilities has been conceptualized as shown in Figure 1.0 below:

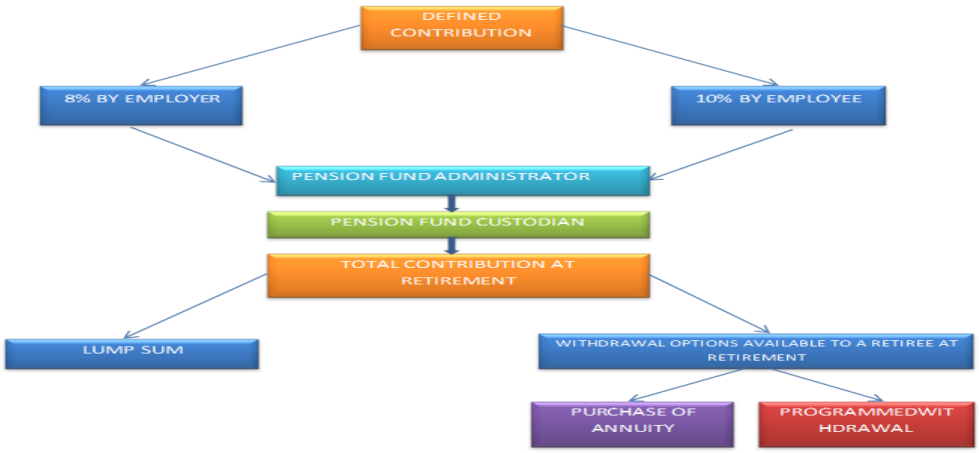

Figure 1.0: A chart showing the summary Benefit Contribution Recommended in the Nigeria Pension Reform Act, 2014.

Empirical Review

Several prior research conducted around the world looked at the relationship between projected expenditure and pension payout preferences. However, the alternatives for paying out accrued retirement benefits vary significantly between countries. Some countries allow only one type of retirement payment, while others allow multiple types or even a mix of them. Many of the reformed systems are still in transition in certain countries, while new systems have yet to reach the payout phase (Antolin, Pugh & Stewart, 2008). In several of these countries, a structure for shifting from the accumulation to the payment phase has yet to be established or even specified in detail. Nonetheless,

if the new systems are to fulfill their purpose of providing efficient and effective retirement incomes, the retirement payout options phase is just as vital.

While other countries across the world are focusing their efforts on the retirement payout phase of accumulated retirement contributions, there is a paucity of scholarly guidance and studies on how Nigerian potential retirees want their retirement benefits disbursed throughout their retirement. This could explain why, in practice, there is a lot of uncertainty in Nigeria about the appropriate retirement contribution payout options phase. However, it appears that the majority of studies are focused on the investment management and mishandling of pension funds.

Dillingh & Zumbuehl (2021) focused their research on the current and announced pension payout patterns in the Netherlands, examining the extent to which the currently available payout options (a flat-rate annuity, a high/low annuity-based profile, and a partial lump sum at retirement with a lower annuity pension thereafter) are used. They also take into account the impact of various characteristics of the options, such as comparable prices based on the applicable interest rate and the percentage of accessible pension capital that can be (re)distributed over time. They tangled up their investigation by looking at which demographic and personal variables are linked to pension payout preferences. The findings demonstrate that, while a consistent payout pattern is the most popular, there is also a lot of curiosity in the other possibilities.

Brown, Kapteyn, Luttmer, Mitchell, & Samek, (2021), use a randomized experiment with around 4,000 persons in a nationally representative sample of the United States to investigate two behavioral characteristics that reduce people's ability to value a lifetime income stream or annuity. They discovered that adding complexity to the annuity selection affects respondents' ability to value the annuity, as assessed by the difference between the sale and buy values they assign to it. People's capacity to value an annuity improves by restricting limited choice bracketing and encouraging them to think first about how quickly or slowly they want to spend down assets in retirement.

By deriving multiple correlations between the contract parameters, Van Bilsen and Lans Bovenberg (2020) models the decumulation duration of a Personal Pension with Risk Sharing (PPR). They discovered through their research that individuals can take one of two approaches to the decumulation period of a PPR: investment or consumption. Individuals specify how to invest wealth and how much wealth to withdraw in the investing technique. They also mentioned that retirement consumption is driven by endogenous factors. Individuals specify retirement consumption exogenously under the consumption approach. They investigate these two techniques in depth in terms of habit building,

allowing for excess smoothness and sensitivity in retirement spending. They came to the conclusion that investment and withdrawal policies are endogenously determined.

Vander Cruijsen & Jonker (2019) investigate the impact of people's expectations about retirement expenses and their trust in pension funds on their preferences for various pension systems. The majority of workers want a flat-rate annuity, and many people wish to deviate from it, according to their research. They also discovered that a high/low, annuity-based profile is the most popular option, followed by a partial lump sum payment. Workers who anticipate lower retirement expenses are more likely to choose a high/low annuity-based pension and/or a lump sum payment. Furthermore, workers and retirees who have lost faith in their pension system are more inclined to prefer a lump sum payment over annuities.

Using an online experimental survey, Alonso-Garc'a, Bateman, Bonekamp, Van Soest, and Stevens (2018) assess the importance of alternative reasons for adopting a saving and spending trajectory after retirement. They investigate the influence of alternative retirement drawdown plans, which include various mixes of annuity income and wealth, as well as important life events like growing frail or losing a spouse, on prescribed spending behaviors and underlying saving intentions. Individuals' saving motives are altered in anticipation of important life events, according to their research. They are less sensitive to changes in 'experimental' retirement drawdown arrangements, preferring to stick to the status quo. The findings of their study revealed that the desire to keep precautionary savings is one of the key factors for seniors' widespread behavior of holding on to their riches.

After performing a survey-based experiment with over 3,000 members of a Dutch occupational pension plan, Bockweg, Ponds, Steenbeek and Vonken (2017) report the impact of framing and default settings in annuity demand. They invited participants to split their real anticipated pension accrual between a life annuity and a partial lump sum, with the joint effects of consumption and investment frames, as well as gain and loss frames, being explored. They discover substantial evidence of framing and default setting effects in annuity demand, as well as strong evidence of individual characteristics influencing annuity demand, emphasizing the relevance of participant heterogeneity. When individual variables are controlled for, the findings of their experiments reveal that framing and default effects remain substantial. They came to the conclusion that embers of the Dutch National Pension System generally welcome the partial lump sum option over full annuitization, and then concluded that precise effect framing may have also depend on the institutional environment in which individuals filter their annuities.

Under the new Pension Reform Act 2014 and the repealed Pension Reform Act 2004, Oluwaseyi and Hasim (2015) assess the idea and aspects of contributory pension

schemes in Nigeria, both at the accumulation and pay-out phases. Their research also looks at the two primary types of retirement pay-out choices accessible to employees at retirement, namely, scheduled withdrawal and life annuity, utilizing two case studies of a medical service employee and a teaching service employee working for the Lagos State Government. Using the income replacement ratio to compare both cases, and taking into account a 25 percent and 50 percent withdrawal from the balance of the retiree's Retirement Savings Account (RSA) as a lump sum payment at retirement in their data analysis, the results of their analysis revealed that the life annuity is a better pay-out option than the programmed withdrawal, despite the fact that the life annuity is more expensive. Their final conclusion demonstrates that a teaching service employee who received a 25% lump sum withdrawal under the Pension Reform Act 2014 had the highest replacement ratio. However, the study's best case did not reach the two-thirds income replacement ratio that many researches propose. The findings of their research help Nigerian retirees better comprehend the differences between a planned withdrawal and a life annuity payout.

Ibiwoye and Ajijola (2012) demonstrated how a participant in the DC pension plan introduced by Nigeria's government in 2004 might make an acceptable decision between programmed withdrawal and a life annuity. According to the current wage structure for professors in Nigerian universities, retiring early does not ensure an adequate replacement rate. They claimed that scheduled withdrawal is cost-effective and that there is no cross-subsidy between those who survive for a short period of time in retirement and those who live longer than the projected average. The study looked at the basic bequest motive and tried to come up with a way to provide a retiree with a somewhat predictable annual income for the rest of his or her life. Regardless, the analysis revealed a wide range of variables within the system, with the main disadvantage of programmed withdrawal being the chance of the capital being totally depleted while the retiree is still living. Life annuities, on the other hand, are claimed to have the advantage of paying out for the rest of the retiree's life, thereby protecting them from longevity risk. They came to the conclusion that a life annuity looks to be superior to a planned withdrawal in this aspect. They believe that life annuities are the way of the future for all employees, because with scheduled withdrawal, the retiree may be incurring risks on his or her own. The quantity and duration of scheduled withdrawals are supposed to be based on typical life expectancies, yet an individual retiree can easily outlive these averages. Even if the payments are updated each year based on the retiree's expected future life expectancy and the shrinking group of his or her surviving cohorts, the capital to be shared can eventually drop to the point where the adjusted periodic payments are unattravtive. They also agreed with Antolin, Pugh, and Stewart's (2008) general premise that the expenses of executing a planned withdrawal and actively investing assets are higher than the expenditure loadings in a life annuity contract.

Antolin (2008) examined how countries' pension arrangements and regulations shape the appropriate structure and flexibility of retirement pay out options, with the goal of providing policymakers with a guide on how to address the various questions posed when designing the pay-out phase under the DC arrangement, as well as encouraging an annuity market. Chile, the United States, and the United Kingdom were the focus of his research. The study looked into what types of retirement pay out options for accumulated assets under a DC plan a country should allow, who should provide annuities, and what types of annuity products should be permitted. He came to the conclusion that in the pay-out period, three options are fundamentally available, but how and when to acquire them relies on the legislation in each country and the existence of annuity markets to provide this requirement for retirees. This study's findings emphasize the relevance of annuity markets in providing retirement security. The findings of this study are critical for nations like Nigeria, which are only now realizing the shortcomings of other payout choices and the necessity to build annuity markets. The study, however, lacks a specific solution for the payout phase's control procedure, claiming that the decummulative phase can only be reached through trial and error or through phase experiences. Depending on what works for a particular country, these could be transformed into policies.

Antolin, Pugh & Stewart (2008) researched the several types of retirement benefit payments that are available in different nations throughout the world, with a focus on Brazil, Canada, Chile, Hungary, and the United Kingdom. According to their findings, there is a lot of variation between countries. While some countries only allow one type of retirement benefit payment, others allow multiple types or even a mix. They also discovered that pension funds often provide lump payments and scheduled withdrawals, but annuity suppliers ranged from insurance firms to pension funds, financial intermediaries, and a centralized annuity fund. The findings of this study are critical to the development of Nigeria's pension system because they give a framework for the design and management of a cost-effective and long-term benefit system. The discovery that annuities can be given by a variety of institutions (both private and public) other than insurance firms should influence the development of annuity markets in countries like Nigeria. As already mentioned, this study only focused on the determination of the better retirement benefit options under the 2014 Nigeria Pension Reform Act and the relationship and differences that exist between an annuity and a programmed withdrawal using the retirement savings account balances of retirees and the limited available information provided in the 2014 Pension Act.

METHODOLOGY

The two payout possibilities stated in the 2014 Pension Act on the basis of the cumulative retirement contributions Account of the potential retiree are calculated in this study using

actuarial fundamental rules in practice, with a framework of research methods and techniques. The approach employed directs the research work toward determining the optimal payout option for potential retirees by using a formal, objective, and systematic methodology to collect quantitative data about the study. Because the goal of the study was to determine the best payout option for potential Nigerian retirees' retirement contributions after retirement as stipulated in the 2014 Pension Act, a cross-sectional research design was used to allow for the use of methods that can aid in the future design of successful studies.

The research was conducted assuming that the contributions might be invested in the future at an average rate of interest, as employed by the Retirement Saving Account account of the potential retirees, to make the cumulative retirement benefits in the RSA account of the potential retirees actuarially legitimate (Sogunro, Adeleke, & Ayorinde, 2019). This rate of interest is used in the study because it indicates the projected long-term return on new investments. The analysis was done using basic elements of the required functions as indicated by actuaries over the years. They are used to build calculation tools and methodologies that are suitable for the framework computation of cumulative retirement benefits in the RSA account, which is necessary to support the projected retirement phase of life of the future retiree using 2019 micro-soft excel sheet, as follows:

(i) The chance of future events triggering the scheme’s benefits payments. This rate can also be used to determine the number of survivors who contribute to the scheme over time, starting with initial group, and therefore the contribution pattern.
(ii) The death rate among retirees.
(iii) Elements that will allow for the estimation of the amount of each future payment into and out of the program.
(iv) Compound interest functions.

Despite the fact that this may represent a sweeping simplification of a complex situation, a single salary scale (table 2) was constructed to consider the basic elements of required functions and the construction of various functions from them, which is normally used for the pay projections of a large group of members (Lee, 1986). In addition, the Average Income Replacement Rate (table 3) is used to provide early insight to professional individuals who want to know if their expected savings are on track, so they can adapt their present living standards for a viable retirement life.

ACTUARIAL ASSUMPTIONS FOR ANALYSIS

Most pension programs base their contributions and benefits on pensionable earnings. This necessitates the use of actuarial projections in accordance with Act No. 4 of the 2014 Nigeria Pension Act and guidelines issued by the Nigeria Pension Commission, in order to estimate amounts of pensionable earnings from time to time in the future and allow for the equitable transfer of risk in many situations; thus, the contribution rate is determined using the following assumptions:

i. At least half of the employee's accumulated contribution money was used to purchase a life annuity with monthly or programmed withdrawals at retirement age. This is in accordance with Act No. 4, Part XII of the 2014 Nigeria Pension Act, as well as the Nigeria Pension Commission's instructions.

ii. s_y=$1.03^y$is the salary scale, where y is an integer (Actuarial projections to estimate amounts of pensionable earnings from time to time in the future). This is based on a recent compensation structure empirical investigation (Sogunro, 2016).

iii. The salary is expected to rise steadily. This is to make analysis easier.

iv. Contributions to the fund are made at the end of each month throughout the year, based on the year's net income pay. This is in accordance with the 2014 Nigeria Pension Act, Act No. 4, Part IV, 11(3b).

v. Based on the PMA92C20 Mortality Table, annuities purchased at retirement are priced and estimated assuming a 6% annual interest rate. This is the rate used in the Nigerian insurance business.

vi. The funds are invested at a rate of 10.21% and is paid out in full when the scheme is discontinued. This is in accordance with Act No. 4, Part XII of the 2014 Nigeria Pension Act and the Nigeria Pension Commission's directives.

vii. y is the retirement age (Variable age at retirement).

viii. The average replacement rate (RR) % benchmark is calculated using formulas as shown in equation 1 below.

10. Potential retiree is assumed to die 25 years after retirement.

The Average Replacement Rates

$$Replacement\ rate = \frac{Annual\ pension}{Earnings\ at\ last\ working\ age} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Different methodologies have been used in previous research in other nations throughout the world to determine the best payout option suitable for accumulated retirement contributions at retirement. In performing the analysis, a statutory retirement age of 65 was used, and employees were assumed to enter the workforce at the age of 25, stay for 40 years, and die 25 years after retirement. Both the employer and the employee were assumed to have contributed a minimum of 18 percent of the employee's yearly basic pay to retirement, with the employer contributing 10% and the employee contributing the remaining 8%. This was accumulated over the duration of the employee's employment with the company. At retirement, the whole sum of these accumulated values of yearly contributions, less a lump sum, was used to purchase an annuity or programmed

withdrawal that would pay the retiree set sums for the rest of their lives. In order to analyze these calculations, a Microsoft Excel worksheet was extensively employed, using the formula model for the life annuity and programmed withdrawal with monthly payment.

Model for Life annuity with mthly payments

A monthly life annuity due model that makes a payment of $\frac{1}{m}$ at the beginning of every mthly period to sum up in one year the total payment of 1 unit was considered, $with\ m = 12\ for\ monthly\ annuity\ payment$. This is expressed in the actuarial mathematically model below:

$$\ddot{a}_x^{(m)} = \sum_{n=0}^{\infty} \frac{1}{m} V^n\ {}_mP_x \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

Alternatively:

$$\ddot{a}_x^{(m)} = \frac{1-A_x^{(m)}}{d^{(m)}} = \ddot{a}_x - \frac{m-1}{2m} \quad \ldots\ldots\ldots\ldots \quad (3)$$

Where Life annuity due model is expressed as periodical payment paid at the beginning of the term or year. The annuity first payment was made at time $t = 0$ and the last payment at time $t = n - 1$, where

$$\ddot{a}_x = \sum_{k=0}^{\infty} V^k\ {}_kP_x \quad (4)$$

Using AM92 actuarial mortality table to obtain the value of the annuity due factor $\ddot{a}_x$, was used as the denominator of the Retirement Savings Account Balance to obtain the accumulation. The accumulations were divided by 12 to get their monthly annuity payments.

4.0 Data Analysis

The analysis for the study involves calculating the salary scale of employees, the accumulation of funds in the Retirement Saving Account, and also the replacement rates of the pensioners for both the programmed withdrawal payout and the annuity payout methods.

Table 1: Data

	STEP 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
GL 1	1,478,046	1,520,824.00	1,563,603.00	1,606,381.00	1,649,159.00	1,691,938.00									
	123,170.50	126,735.33	130,300.25	133,865.08	137,429.92	140,994.83									
2	1,695,770.00	1,746,118.00	1,796,468.00	1,846,818.00	1,897,166.00	1,947,516.00	1,997,865.00	2,048,214.00							
	141,314.17	145,509.83	149,705.67	153,901.50	158,097.17	162,293	166,488.75	170,684.50							
3	1,925,958.00	1,980,666.00	2,035,373.00	2,090,081.00	2,144,788.00	2,199,496.00	2,254,203.00	2,308,911.00							
	160,496.50	165,055.50	169,614.42	174,173.42	178,732.33	183,291.33	187,850.25	192,409.25							
4	2,425,322.00	2,512,904.00	2,600,486.00	2,688,069.00	2,775,651.00	2,863,233.00	2,950,816.00	3,038,398.00	3,125,980.00						
	202,110.17	209,408.67	216,707.17	224,005.75	231,304.25	238,602.75	245,901.33	253,199.83	260,498.33						
5	3,428,047.00	3,553,649.00	3,679,250.00	3,804,852.00	3,930,454.00	4,056,056.00	4,181,658.00	4,307,259.00	4,432,861.00	4,558,463.00	4,684,065.00	4,809,667.00	4,935,269.00		
	285,670.58	296,137.42	306,604.17	317,071.00	327,537.83	338,004.67	348,471.50	358,938.25	369,405.08	379,871.92	390,338.75	400,805.58	411,272.42		
6	4,175,818.00	4,327,636.00	4,479,454.00	4,631,272.00	4,783,091.00	4,934,909.00	5,086,727.00	5,238,545.00	5,390,364.00	5,542,182.00					
	347,984.83	360,636.33	373,287.83	385,939.33	398,590.92	411,242.42	423,893.92	436,545.42	449,197.00	461,848.50					
7	5,073,220.00	5,249,996.00	5,426,774.00	5,603,551.00	5,780,327.00	5,957,105.00	6,133,883.00	6,310,662.00	6,487,437.00	6,664,214.00					
	422,768.33	437,499.67	452,231.17	466,962.58	481,693.92	496,425.42	511,156.92	525,888.50	540,619.75	555,351.17					

Source: *Unilag Salary, effective date: 18TH APRIL, 2019*

Estimation of Salary Scale

The data shows that the salary increment of the Nigerian academic staff follows an exponential progression. The inflation factor is commonly written as $(1 + \boldsymbol{e})^{x}$, where e is the expected yearly rate of future salary increases. According to the data, wage increases for Nigerian academics follow an exponential pattern.

$$s_x = (1 + \boldsymbol{e})^{x} = (1.03)^{x}$$

This is an indication that the salary of Nigerian academic staff increases by 3% annually. For someone who starts work at age 25, the table below shows the salary growth rate.

Table 2: Salary Scale Function for the Academic Staff assumed $\boldsymbol{x = 25}$

Age (Y)	$\boldsymbol{s_y = (1.03)^{y-x}}$	Expected Annual Salary Amount
25	1.00	1,478,046.00
26	1.03	1,522,387.38
27	1.06	1,568,059.00
28	1.09	1,615,100.77
29	1.13	1,663,553.79
30	1.16	1,713,460.41
31	1.19	1,764,864.22
32	1.23	1,817,810.15
33	1.27	1,872,344.45
34	1.30	1,928,514.79

35	1.34	1,986,370.23
36	1.38	2,045,961.34
37	1.43	2,107,340.18
38	1.47	2,170,560.38
39	1.51	2,235,677.19
40	1.56	2,302,747.51
41	1.60	2,371,829.93
42	1.65	2,442,984.83
43	1.70	2,516,274.38
44	1.75	2,591,762.61
45	1.81	2,669,515.49
46	1.86	2,749,600.95
47	1.92	2,832,088.98
48	1.97	2,917,051.65
49	2.03	3,004,563.20
50	2.09	3,094,700.09
51	2.16	3,187,541.10
52	2.22	3,283,167.33
53	2.29	3,381,662.35
54	2.36	3,483,112.22
55	2.43	3,587,605.59
56	2.50	3,695,233.75
57	2.58	3,806,090.77
58	2.65	3,920,273.49
59	2.73	4,037,881.69
60	2.81	4,159,018.15
61	2.90	4,283,788.69
62	2.99	4,412,302.35
63	3.07	4,544,671.42
64	3.17	4,681,011.56
65	3.26	4,821,441.91
66	3.36	4,966,085.17
67	3.46	5,115,067.72
68	3.56	5,268,519.75
69	3.67	5,426,575.35

Source: *Researchers computation, using Microsoft Excel*

4.1 Accumulation of Fund in the Retirement Saving Account

Assuming the sum of annual salary (₦1,478,046.00) to be earned by an individual that got into the workforce at age 25 and retire at age 65 using the assumptions below;

Table 3: Assumptions for the Accumulation of Fund in the RSA

Assumptions	Rates
Salary Increase (Continuously)	3%
Employee Contribution	8%
Employer Contribution	10%
Interest on investment (Bond for instance)	10.21%

Using the actuarial accumulation of employee yearly contributions:

$$F = \frac{C(₦SAL)}{m}\sum_{k=1}^{m(y-x)}(1+e)^{\frac{k}{m}}(1+i)^{\frac{m(y-x)-k}{12}}$$

$$= \frac{0.18(₦1{,}478{,}046)}{12}\sum_{k=1}^{480}\left(1.03^{\frac{k}{12}}\right)\left(1.1021^{\frac{480-k}{12}}\right)$$

$$= \frac{0.18(₦1{,}478{,}046)}{12}(1.1021^{40})\sum_{k=1}^{480}r^{k}$$

$$where\ r = \left(\frac{1.03}{1.1021}\right)^{\frac{1}{12}} = 0.99437764423$$

$$= \frac{0.18(₦1{,}478{,}046)}{12}(1.1021^{40})\sum_{k=1}^{480}r^{k} = \frac{0.18(₦1{,}478{,}046)}{12}(1.1021^{40})\sum_{k=1}^{480}r^{k}$$

$$= \frac{0.18(₦1{,}478{,}046)}{12}(1.1021^{40})\left(\frac{r-r^{481}}{1-r}\right)$$

$$F = ₦178{,}745{,}943.25$$

Based on Act No. 4, Part XII of the 2014 Nigeria Pension Act and guidelines issued by the Nigeria Pension Commission, assuming that at most 50% of the employee's accumulated contribution fund in the Retirement Saving Account was used to purchase a monthly life annuity or monthly programme withdrawal at retirement. The table below shows how programmable monthly withdrawals are computed based on the retiree's estimated life span and the life annuity purchased from an insurance company:

Table 4: Analysis for the Monthly pension receivables in Future

Options	**Pension Payment**
Programme Withdrawal	₦575,831.31
Annuity	₦736,598.52

See Appendix for detailed result

Therefore, the monthly pension for the programmed withdrawal is 575,831.31 assuming 6% investment earning after retirement for 300 months (25 years), while the computed monthly pension benefit for an annuity is 736,598.52.

Table 5: Results for the Average Replacement Rates for all the retirees

Annuity Payout option	183%
Programmed withdrawal payout option	143%

As shown in Table 5 above, the average replacement rates calculated for the programmed withdrawal and annuity are 143% and 183%, respectively. The implication of the result is that an annuity is a better payout option as compared to a programmed withdrawal.

RESEARCH FINDINGS AND DISCUSSION

When the above assumptions are used and the information stipulated in the 2014 Pension Act is considered, a retiree is entitled to at most 50% of the balance in his or her RSA (i.e., to purchase a programmed withdrawal or annuity on retirement), which is used to determine the retirement benefits to be collected by a potential retiree when considering a programmed withdrawal or annuity. Therefore, in determining the better withdrawal option for retirement benefits as stipulated in the 2014 Pension Act for Nigerian retirees after retirement, the results of the findings show that the salary of Nigerian university academic staff increases by 3% annually. The accumulated amount in the RSA using the stated assumptions amounts to the monthly retirement income for the programmed withdrawal is 575,831.31 after 300 months (25 years) of investment earning at 6%, and the value of the annuity estimated was 736,598.52 per month, all of which are computed based on the retiree's expected life expectancy. Also, the calculated average replacement rate for both the programmed withdrawal and annuity is obtained as 143% and 183%, respectively. This implies that an annuity is a better payout option as compared to a programmed withdrawal. This research effort is geared towards creating awareness for employees who will someday retire to consider an annuity as a better option for program withdrawal as it provides a better replacement rate.

Therefore, based on the results of the analysis, potential retirees from federal university academic staff should invest their accumulated retirement benefits in purchasing life annuities and opt for life annuity purchases when retired to get better spending benefits and maintain their welfare and lifestyle as before retirement. These findings are consistent with the results reported by Poterba, Mark, and Warshaskey (1999), Mitchell (2001), Poterba (2001), Antolin (2007), and (2008).

CONCLUSION AND RECOMMENDATION

Determining the payout option is a key component of any retirement plan's success in terms of achieving the retirement goal. Building annuities into pensioners' pension plans looks to be one of the safest backup plans for potential Nigerian retirees because it ensures a reasonably high level of withdrawals with no risk of depletion. Millions of pensioners will be spared the problem of converting their amassed assets into retirement income as a result of these measures. This is because a retirement annuity elicits a broader range of reactions and provides a steady stream of income, often for the rest of one's life. The annuity allows individuals to save a larger sum of money while deferring taxes, and there is no annual contribution limit. When compared to taxable investments, the opportunity to keep every penny invested working for retirees can be a significant benefit. These features enable retirees to save more money for retirement and are especially beneficial for individuals who are approaching retirement age and need to catch up.

As a result, the study suggests that potential retirees should purchase a life annuity to protect themselves against outliving their assets and to provide a long-term income stream for better living conditions in old age, as recommended by typical life cycle models. Employees should focus on purchasing more annuity products, which will be more beneficial after retirement. This is in addition to the baseline 18 percent payment made while employed. Furthermore, the government should build a well-developed and transparent annuity market, which is a precondition for the growth of the payout phase, not only to help with retirement funding but also to promote knowledge about the implementation process in general.

In addition, other retirement income sources, such as pension schemes, can be supplemented with an annuity. When retirees decide to cash out, they can choose to get a lump-sum payment from their annuity, but it is better for retirees to set up guaranteed payments for a specified period of time or for the rest of their lives, ensuring a consistent stream of income.

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