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Pension Shortfalls Recovery Techniques in Federal Universities in Nigeria

[*]**Joshua Solomon Adeyele,** University of Jos
Mohammed Nasirudeen Maiturare, Ahmadu Bello University
E-mail: adesolojosh@gmail.com

Abstract: *Ascertaining the extent of pension liabilities at any point in time is a critical exercise that must be undertaken at regular intervals. As contributions to employees' retirement saving accounts (RSAs) are expected to be made monthly, failure to comply by many employers has resulted to pension shortfalls that needs to be determined so that the beneficiaries of defined contribution (DC) scheme are not underpaid when they retire. Carrying out this exercise requires sound actuarial models that capture all funds not remitted as well as returns on expected contributions. Mixed method in terms of primary and secondary data were adopted for the study. The models developed in this study systematically account for all accruing benefits to employees in which their employers omitted to pay into their RSAs. Specifically, our findings revealed that out of 550 employees from the selected institutions, 260 employees are being owed N191,687,720.46. Based on the pension shortfalls estimate, we concluded that the current members of DC with no funds being remitted to their retirement saving accounts as and when due risk substantial pension wealth for as long as default continues. Consequently, we recommend that the National Pension Commission (NPC) should come to the aid of affected employees by making sure that employers take deliberate step to repay the estimated liabilities and other outstanding liabilities to their RSAs.*

Keywords: Pension shortfalls, Valuations, Recovery techniques, Define contribution, Mixed method

1. Introduction and Rationale of the Study

New evidence on pension shortfalls has emerged through the revelation by the Commission (2021), that out of 9.2 million retirement saving accounts (RSAs) in the country, about 3.5 million (38%) of them were empty as at the end of 2020 (Uwah, 2021). Commission (2021) clarified that most of the unfunded accounts belong to employees of state and private sector organisations thereby creating funding gaps that must be recovered within the short period left for the affected employees to retire. The regulatory body noted that

[*]Corresponding Author

the investigation leading to discovery of funding deficit was conducted in order to uncover reasons for delay in the payment of accrued pension rights to retirees. The body also noted that there is issue of inaccurate data on schedules accompanying pension remittances and other reconciliation issues which also contributed to delay in pension payment to retirees in public sector (Commission, 2021). The implication of all these is that many workers are set to retire with nothing to fall back on their old age.

The problems militating against pension scheme in state and private organisations are currently attending to the Federal Pension workers especially the academics in Federal Universities (Adeyele, 2015). In January 2020, due to the refusal of academics to be enrolled into Integrated Personnel and Payroll Information System (IPPIS), many members have experienced non remittances of their monthly pension contribution to their respective RSAs. The increasing rates of pension defaults in all sectors of economy is a cause for concerns.

Despite the increasing waves of pension gaps, many affected employees particularly the academics seem to be unaware about the danger ahead at the payout phase of retirement. Some believe that they will be paid their equivalent final salary if such persons retired at professorial cadre. In the former defined benefit (DB) scheme that was abandoned for defined contribution (DC) scheme, employees receive equivalent portion of their final salaries as pension. For instance, all employees who have worked for a period up to 35 years of service without changing employer receive 80% of their final salaries as pension in addition to three times of final annual salary as gratuity.

The scheme (DB) was guaranteed for 5 years which means the retiring employees will receive the actuarial equivalent of 80% of his final annual salary for 5 years. In the event of death before the 5 years elapsed, his/her nominated beneficiary will be paid the remaining actuarial equivalent balance. Hence, in the absence of death, the retiree will continue to enjoy pension benefits as long as he/she lives. This type of pension generosity which could not be sustained under DB was modified and reintroduced into Act (2014) for academics on professorial cadres under the DC scheme.

Meanwhile, in the former DB, actuarial valuations were conducted on a regularly basis usually every three years to ascertain the level of scheme solvency (Adeyele & Maiturare, 2012). These valuations enable employers to set funds aside to meet up with future obligations in the event that the scheme deviated from the future experience. Where there is an underfunding, employer may have to make additional contributions. The level of pension solvency under DB is a function of interest rate environment and returns on equity market's performance. The decline in funding ratios can be traced to the low interest rate environment and poor equity market returns, together with longer term pressures such as revisions in life expectancy assumptions (Blommestein, 2000; Brown & Warshawsky, 2001; Yermo & Severinson, 2020).

The applicability of the concept of funding gap to defined contribution pension is not well understood by many academics in federal universities. Adeyele et al (2020) undertook how the shortfalls due to irregular remittances to employee's retirement saving account can be accounted for on either monthly or yearly basis in which pension contributions are in default due to either paucity of funds by employer or deliberate act to defraud the employees.

The fact that it is stated in the Act (2014), that only employees on professorial cadre will receive their terminal salaries as pension does not imply that funding gaps for each year of service should not be undertaken for other staff members. This is just a pension promise that has never been fulfilled by government and that is why Commission (2021) needs help for actuarial valuation of funds to be conducted every year in order to ascertain the amount of shortfalls (gaps) in current DC pension to be credited to affected employees' RSAs.

It must be stated that in spite of generous pension promise, every employee must be aware that none of them will receive more than what they have in retirement saving account. Government promise on receiving final salaries as pension at professorial grade level has nothing to do with pension payment under the DC payout phase except the law is amended to allow for this. The parties involved in DC pension are life annuity underwriters and PFAs. The only groups that government is directly responsible for pension payments are those in military and secret service personnel which still operate their scheme as defined benefit and not DC. The only thing that Commission (2021) as regulatory body is doing under the DC is to value the pension contributions at the rate of 6% per annum when any employee retires (who do not have RSA) whether at professorial cadre or otherwise. This is only applicable to Federal Government employees and not to state or private employees.

On this premise, what happen to those in private and state organisations if those who should educate other colleagues not in actuarial science profession claimed funding gaps is not applicable to defined contribution? Would they also receive their terminal salaries as pension? Of course not. In fact, some employers in these organisations are not even able to pay salaries as an when due not to talk of paying terminal salaries as pension. This is one area the current study will be applicable to determine the amount of pension shortfalls in defined contributions. We do not have to wait endlessly until there is crisis before remedy is sought.

Many studies on pension and old age security in Nigeria have always been on defaults or more of analysis of policy implication of defaults with no substantial techniques that can be readily applied to solve the existing problems. Two of the few studies that lately examined funding gaps in pension remittances was carried out by Adeyele & Igbinosa (2015) and Adeyele et al. (2020). Their studies considered models for shortfalls recovery

for single individuals in the context of funding gaps. However, models for ascertaining the number of years of default combined with amount of pension liabilities for cohorts of different universities were not included in their models. In the light of this and in order to assist the beneficiaries of DC pension, the present study came up with models that will enable group of homogeneous institutions determine the amount of pension liabilities of the scheme members with irregularities in their pension contributions in Nigeria.

2. Literature Review

The main function of a country's pension system is to guarantee the adequate insurance of the population against old age poverty (Holzmann, Hinz, & Dorfman, 2008). Although the major driving force behind the governments' initiative in reforming the pension system seems to be the increasing burden of government employees' underfunding of pension liabilities (Subhedar, 2005).

In most countries, reforms to pension systems were carried out using a combination of changes to parameters of pre-existing regimes, (minimum age, minimum years of contribution in order to retire), along with a structural modification in the paradigm of the systems via the introduction of individual savings accounts and private management (Bloemen, 2008). However, pension reforms differ across the globe but they all tended towards financial security of the aged employees.

In Nigeria, the main purpose of the Act (2014) is to ensure that all employees who have contributed funds to their retirement saving accounts (RSAs) for a specified number of years would not only have their retirement income guaranteed but also live a comfortable post retirement life (Adeyele & Imouokhome, 2014).

With DC pension, employees and employers jointly contribute a defined percentage of employees' salaries towards employees' old age and use the total funds contributed for two types of retirement income available to them at retirement including phased or programmed withdrawal and life annuity. Unlike the defined benefit scheme associated with investment risks and longevity shouldered by employers, employees are responsible for investment risk during their working lives of DC pension (Cannon & Tonks, 2008; Dushi et al., 2013) and after retirement. They are also responsible for making decision to manage and draw down their account balances (Mackenzie, 2010). Thus, the type of retirement plan available is important given plan differences in risks assumed during the accumulation and distribution phases.

Over the past decades, the importance of pension systems to the economic stability of nations and the security of their ageing populations have been recognized by countries at all levels of development. However, it is uncertain that many members of DC pension

particularly the academic staff of the Nigerian Universities will receive old age income equivalent to their current salaries. Whereas, the former defined benefit scheme provides stable financial security to retirees for as long as they live, the present DC is faced with many problems such as irregular remittances of contributions to employees' retirement saving accounts (RSAs), investment risks and longevity risk in which the employees as owners of RSAs are responsible.

A poor performance of pension investment as well as failure of the employers to comply with Act (2014) may significantly lead to shortfalls in old age financial security. As some university employees are getting closer to retirement phase of employment cycle, there is uncertainty of whether their total contributions can enable them live above poverty level (Adeyele, 2015; Adeyele & Imouokhome, 2014). For the past 14 years on, a look at the results of these pension models from different viewpoints makes it clear that, despite a number of encouraging consequences, the reforms have not been wide reaching enough to tackle shortcomings in terms of accumulation and payout phases. Act (2014) makes provisions for both defined benefit (DB) and defined contribution (DC) schemes, but the former is widely accepted by most employers.

2.1 Pension Shortfalls Recovery Techniques

Regular and prompt remittances of pension contribution to retirement saving accounts of employees give a level of security to the scheme's funds and peace of mind to the contributors. Basically, the amount of pension wealth under DC scheme depends on returns on investment (Ngugi, Njuguna & Wambalaba, 2018). Meanwhile, the prevailing COVID-19 has affected many employers' ability to make remittances as and when due thereby creating funding gap in in DC pension (Adams-Prassl et al., 2020; Feher &. de Bidegain, 2020; Trusts, 2019).

It has been speculated that irregularities in pension remittances widen the level of funds' insecurity in that the amounts that should have gone into investment scheme are being held back by employers and consequently no returns therein. The amount held back in pension parlance represents nominal contributions while the invested funds represent the accumulated funds. Hence, the difference between accumulated and nominal funds gives returns on investment (funding gaps). The degrees of funding gap is aggravated by the number of years the contribution remain in default. The outstanding funds with employers are modelled with various assumptions.

Let the rate of contribution be denoted by C_r, and $s_m^1, s_m^2, \ldots, s_m^i$ be the monthly salaries for the 1st, 2nd, … to ith years. If $C_m^1, C_m^2, \ldots C_m^i$ are monthly contributions for the 1st, 2nd, to ith years, then the detailed equivalent of 1st, 2nd, ..ith pension contributions are given as:

$$C_m^{1,2,..i} = \begin{cases} C_r \times s_m^1 = C_m^1 = 1st\ year\ monthly\ contribution; \\ C_r \times s_m^2 = C_m^2 = 2nd\ year\ monthly\ contribution \\ C_r \times s_m^3 = C_m^3 = 3rd\ year\ monthly\ contribution \\ \ldots \quad \ldots\ldots \quad \ldots\ldots\ldots \\ \ldots \quad \ldots\ldots \quad \ldots\ldots\ldots \\ C_r \times s_m^i = C_m^i = ith\ year\ monthly\ contribution \end{cases} \tag{1}$$

example, $C_r \times s_m^0 = C_m^0$. The C_m raised to power

employment . This type of

payment is synonymous with annuity due

unde (annuity certain).

d funds' formula for the first ith

years are derived as follows:

$$APF_1 = C_r s_m^1 = A(M,F)C_m^1 \tag{2}$$

$$APF_2 = A(M,F)\left\langle C_m^2 + C_m^1(1+r)\right\rangle \tag{3}$$

$$APF_3 = A(F,M)\left\langle C_m^3 + C_m^2(1+r) + C_m^1(1+r)^2\right\rangle \tag{4}$$

....

....

$$APF_i = A(F,M)\left\langle \sum_{i=0}^{n} C_m^{n-i}(1+r)^i \right\rangle \tag{5}$$

Where

APF_i = *accumulated pension funds for i years;*

n is total number of years of contribution while i represents different years of service

$$A(F,M) = \left[\left(1+\frac{r^m}{m}\right)^m - 1\right]/[r^m/m] = \text{convertable monthly}$$

ards to 10% for employer and 8%

Adeyele et al. (2020) is given as

$$APF_n = A_{B2014}^F\left[\sum_{p=0}^{t} {}^{RC}s_m^{n-p}(1+r)^p\right] \pm A_{A2014}^F\left[\sum_{p=0}^{t} {}^{RC}s_m^{n-p}(1+r)^p\right] \tag{6}$$

A_{B2014}^F A_{B2014}^F= accumulated funds

based on 3% adjustment in contribution.

The positive and negative signs in Equation (6
could be upward or downward. Where ther
Equation (6) reverts back to Equation (5).

The loss recovery models developed by Adeyele et al (2020) stops at Equation (5) as they do not default. We extend these models to incorporate t scheme but nominal, the formula is given as:

$$\text{Nominal } PenCon = \left\langle C_r \times M_m^1 \times n_z \right\rangle + \left\langle C_r \times M_m^2 \times n_z \right\rangle + ... + \left\langle C_r \times M_m^i \times n_z \right\rangle$$
$$= C_r \times N_m \times \left(M_m^1 + M_m^2 + ... + M_m^i\right) \quad (7a)$$

$$\text{Nominal } PenCon = \sum_{i=0}^{n} C_r \times C_m^i \times n_z \quad (7b)$$

where n_z = *number of times funds are to be contributed but* defaulted *per annum*

C_r = *contribution rate*

M_s = *monthly salary*

$C_m^i = C_r \times M_s^i$ = *Monthly contribution*

$s_{i=1\ to\ n}$ = *salary increase per annum from* 1*st to nth year*

nominal funds. Therefore, subtracting (7) from (5) gives the following equivalent pension shortfalls (PSF):

$$PSF = A(F,M)\left\langle \sum_{i=0}^{n} C_m^{n-i}(1+r)^i \right\rangle - \sum_{i=1}^{n}(C_m^i \times n_z) \quad (8)$$

n = *number of years in contribution,* p = *number of years remiaining to retire or contribute*

$A(P,L)$ as accrued pension
the past years in which
contributio

$$A(P,L) = V(F_x, n_y) \quad (9a)$$

$$\text{where } V(F_x,n_y) = A(F_n,C_m)\left[\sum_{p=0}^{t} {}^{RC}s_m^{n-p}(1+r)^p\right] \times n_y \quad (9b)$$

$A(P_n^F, C_m)$ = *accumulated pension funds for* n years *convertible monthly at rate,r*

n_y = number of employees

Equation (9b) will account for all the pension liabilities for cohorts of homogenous characteristics.

3. Data and Methods

This study made use part of data collected by Adeyele et al. (2020). These data which are divided into primary and secondary were obtained for four federal universities in

North Central Nigeria. The secondary data were extracted from their earlier work on funding gap to determine the extent of pension liabilities for the four selected universities. The primary data covered the period of 14 years (2004-2018) for all the full-time university employees to ascertain the level of compliance among the employers to Act (2014) in four selected universities.

3.1 Method of Funding Gap Computation

To determine the funding gap that may emanate from years of contribution, 6% per annum convertible monthly where applicable was used to accumulate the pension contributions. This figure which is far less than the 2% fine to be charged if employer defaults was based on Commission (2021) benchmark for computing accruing benefits. Hence, 18% was charged against the consolidated salary to determine monthly pension contribution.

3.2 Determination of Pension Arrears/Benefits

For the purpose of determining the liabilities due to selected employers, it is important to establish those entitled to return on investment and those who may not have legal right to claim return on investment. In this study, those who have submitted their retirement savings accounts to their respective employers have legal entitlement to increase in pension contribution while those who have not done so may not be able to make claim on returns to funds not yet remitted.

3.3 Computation Method

Since the models developed are based on estimates of what an employee's benefit should be throughout years of service, different assumptions were made. We assumed that every employee experiences promotion in every 3 years and starting salary is Consolidated University Academic Salary Structure (CONNUSS) 1 step 1 and annual increment as obtained in Federal Universities. Mixed method in terms of primary and secondary data were used. Questionnaire instrument was used to solicit information from the respondents about the number of years their pension contributions have not been remitted.

Determination of number of times and affected number of institutions were arrived at by making cross tabulation so that associated equivalent amounts for those who submitted their retirement saving accounts and those yet to do so were determined. The results for the two categories of employees are presented in Table 1a and Table 1b (See Appendix 1).

4. Results

4.1 Investigating the Cause of Non-remittance of Statutory Contribution

The results presented in Tables 2a and 2b were conducted with the aim of determining whether the non-remittance of the statutory contribution to retirement saving accounts was due to employees' failure to submit their retirement saving account to their respective employers. Table 2b is another way of viewing Table 2a and is used to determine employees who have issue with pension remittance to their respective RSAs.

Table 2a: Portion of Pension Contribution not Regularly Remitted to RSAs and RSAs Submission Status

		Portion of pension contributions not regularly remitted to employees' RSAs				
		Nil	Employer's	Employee's	Both	Total
RSAs submission status	Yes	147(100.0%)	183(100.0%)	52(100.0%)	137(81.5%)	519(94.4%)
	No	0	0	0	31(18.5%)	31(5.6%)
Total		147(100.0%)	183(100.0%)	52(100.0%)	168(100.0%)	550(100.0%)

Source: Authors' Computation.

Table 2b: Portion of Pension Contribution not Regularly Remitted to RSAs and RSAs Submission Status

		RSAs submission status		Total
		Yes	No	
Portion not yet regularly remitted	Nil	147(28.30%)	0	147(26.70%)
	Employer's	183(35.30%)	0	183(33.30%)
	Employee's	52(10.00%)	0	52(9.50%)
	Both	137(26.40%)	31(100.00%)	168(30.50%)
Total		519(100.00%)	31(100.00%)	550(100.00%)

Source: Authors' Computation.

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Table 2c: Portion of Pension Contributions not Regularly Remitted to Employees' RSAs by Column

		Portion of pension not regularly remitted to RSAs			
		Employer's	Employee's	Both	Total
Figure 1b: Portion of pension default in selected Federal Universities	University of Jos	98(96.1%)	0(0.0%)	4(3.9%)	102(100.0%)
	University Lokoja	20(14.8%)	22(16.3%)	93(68.9%)	135(100.0%)
	University of Ilorin	36(34.0%)	30(28.3%)	40(37.7%)	106(100.0%)
	Federal University of Technology Minna	29(100.0%)	0(0.0%)	0(0.0%)	29(100.0%)
Total		183(49.2%)	52(14.0%)	137(36.8%)	372(100.0%)

Source: Authors' Computation.

Table 2c and Table 2d revealed only those who have submitted their RSAs but still having issues with their pension remittances.

Table 2d: Portion of Pension Contributions not Regularly Remitted to Employees' RSAs by Row

		Portion of pension not regularly remitted to RSAs			
		Employer's	Employee's	Both	Total
Portion of pension default in selected Federal Universities	University of Jos	98(53.6%)	0(0.0%)	4(2.9%)	102(27.4%)
	Federal University Lokoja	20(10.9%)	22(42.3%)	93(67.9%)	135(36.3%)
	University of Ilorin	36(19.7%)	30(57.7%)	40(29.2%)	106(28.5%)
	Federal University of Technology Minna	29(15.8%)	0(0.0%)	0(0.0%)	29(7.8%)
Total		183(100.0%)	52(100.0%)	137(100.0%)	372(100.0%)

Source: Authors' Computation.

Following the analysis in Tables 2a and 2b, it was noted that out of 550 respondents, 519 submitted their retirement saving accounts to their employers. Among these 519 respondents, 147 reported they have no issue with pension contribution remittances while the remaining 372 have issues in their pension remittances in which either employees' or employers' side of contributions were not regularly coming as and when due. However, out of those employees having issues with pension remittances, 143 reported that their arrears have been paid up to date while 229 are required to state the estimated number of years their employers are owing them and this is shown in Table 2a. Also, it is clear from the figures presented that 31 employees are yet to submit their RSAs (see Table 2b). The pension benefits of the category of persons who have not yet submitted their RSAs were computed without any interest charged against their respective employers.

4.2 Pension Liabilities Estimation

Using the number of years in Tables 2a, and 2b, the estimated pension benefits which are liabilities to employers for employees starting career as Graduate Assistant are shown in Tables 3a, 3b and 3c.

Table 3a: Estimated Pension Benefits for Employees who Started Career as Graduate Assistant

Years of default	Institutions				Total
	University of Jos	Federal University Lokoja	University of Ilorin	Federal University of Technology Minna	
1	0.00	0.00	4,700,504.13	0.00	**4,700,504.13**
2	7,855,609.54	12,274,389.91	8,346,585.14	6,873,658.35	**35,350,242.93**
3	2,307,320.04	27,687,840.47	7,691,066.80	0.00	**37,686,227.30**
4	2,141,498.55	53,537,463.81	16,061,239.14	0.00	**71,740,201.51**
5	2,809,498.23	12,642,742.01	4,214,247.34	0.00	**19,666,487.58**
6	1,766,817.73	0.00	5,300,453.20	0.00	**7,067,270.93**
7	0.00	0.00	6,475,932.18	0.00	**6,475,932.18**
	16,880,744.09(24)	**106,142,436.20(120)**	**52,790,027.92(71)**	**6,873,658.35(14)**	**182,686,866.56(229)**

Source: Authors' Computation.

In this Table 3a, about 24 employees in University of Jos who have worked between a period of 2 to 7 years are being owed N16,880,744.09 while Federal University Lokoja have huge pension liabilities of about N106,142,436.20 representing 58.1% of the entire pension liabilities yet to be paid to 120 employees who have worked between 2 to 5 years. This is due to the fact that the amount deducted from the monthly salaries and that of employer are not remitted to their retirement saving account despite making their retirement saving accounts available to their employer. In Federal University of Technology (FUT) Minna, all employees who have worked for 2 years are owed N6,873,658.35 which translates to N490,975.60 per employee.

Table 3b: Nominal Computation of Pension Benefits for an Employee who Started Career as Graduate Assistant but did not Submit RSAs

Years of default	Institutions			Total
	University of Jos	University of Ilorin	Federal University of Technology Minna	
1	0.00	0.00	228,631.85	**228,631.85**
2	0.00	0.00	235,269.90	**235,269.90**
3	0.00	241,907.95	0.00	**241,907.95**

6	0.00	540,454.33	0.00	**540,454.33**
7	0.00	278,042.22	0.00	**278,042.22**
8	0.00	857,565.34	0.00	**857,565.34**
10	4,599,371.81	306,624.79	0.00	4,905,996.60
12	0.00	1,618,014.64	323,602.93	1,941,617.56
Total	**4,599,371.81(16)**	**3,842,609.26(13)**	558,872.83**(3)**	**9,000,853.90(31)**

Source: Authors' Computation.

Table 3b shows the nominal value of N9,000,853.90 pension liabilities the employers owed the 31 employees who have no retirement saving accounts with their current employers from three universities in the following distributions: University of Jos with highest portion of N4,599,371.81 liabilities to be remitted to RSAs of 16 employees, 13 employees in University of Ilorin are owed N3,842,609.26 while N558,872.83 meant for 3 employees in FUT Minna. From the same Table 3b, each employee who has worked for a period of 10 years in University of Jos is owed N459,937.18. Similarly, in FUT Minna, the period is much shorter with 42% of N558,872.83 pension liabilities are meant for two employees who have work for 1 and 2 respectively while the remaining 57.9% is for 1 employee who have worked for 10 years of service. For University of Ilorin the range of years is from 3 to 12 years constituting 42.69% of the entire liabilities. On the average, Federal Government is owning N290,350.13 per employee who are yet to submit their RSAs.

Table 3c: Amount of Pension Liabilities Due to Selected Universities Based on 260 Respondents Starting Career as Graduate Assistant

Years of default	Institutions				Total
	University of Jos	Federal University Lokoja	University of Ilorin	Federal University of Technology Minna	
Pension contribution with investment return added	16,880,744.09 (24)	106,142,436.20 (120)	52,790,027.92 (70)	6,873,658.35 (14)	182,686,866.56 (229)
Pension contribution with no invested return added	4,599,371.81 (16)	0(0)	3,842,609.26 (13)	558,872.83 (3)	9,000,853.90 (31)
Total liabilities	**21,480,115.90 (39)**	**106,142,436.20 (120)**	**56,632,637.18 (84)**	**7,432,531.18 (17)**	**191,687,720.46 (260)**

Source: Authors' Computation.

Table 3c summarized Table 3a and Table 3b to reflect pension contribution with investment returns and nominal pension contributions. The total of the two separate funds amount to total liabilities due the respective employers need to pay the affected employees.

5. Discussion, Conclusion and Recommendations

The amount of pension liabilities determined in this paper incorporated 6% rate of returns on investment. Since the regulatory body is empowered to charge defaulting employers 2% per for as long as default remain, the 6% rate of interest which the Commission (2021) benchmarked for its computation of pension benefits is fairly adequate but far below 24% interest per annum convertible monthly. However, the amount that represents return on investment may not be refunded as employers sometimes pay arrears without incorporating this rate of the interest into what they remit to employee's retirement saving account. Although, if employees wait till retirement, the Commission (2021) may use 6% per annual to accumulated the amount of benefits to be remitted to employees. Meanwhile, employer may have financial difficulty when employees retire thereby making it difficult for employees with no funds in their RSAs to access their pension benefit.

The inability of employers to remit funds as and when due which has negative impact on pension accumulated fund may not be unconnected to the prevailing COVID-19 as rightly observed by Feher & de Bidegain (2020). This has also created funding gaps noted by Adams-Prassl et al. (2020) & Ngugi et al. (2018).

The amount of pension liabilities revealed in this study were based on expectation that at least 6% rate of interest will be used to accumulate funds. However, the current pension trend in the country has clearly showed that funds remitted to RSAs during active years of service do not include returns on investment but nominal.

The exclusion of returns on investment and low yield being reported by many pension fund administrators on a quarterly basis have clearly demonstrated uncertainty of pension funds adequacy. This trend in Nigeria is in line with Yermo & Severinson (2020) that stated that decline in funding ratios are attributable to low interest rate environment and poor equity market returns. This result also revalidate Adeyele et al. (2020) of the existing pension shortfalls that must be recovered. In actual sense, if the the main purpose of Pension Reform Act as stated is to guarantee retirement income for the current set of employees, then government must be more than willing to remit statutory contribution as and when due with accompany interests of fine stipulated in Act (2014).

The computed liabilities in this study further strengthen the paper by Adeyele & Imouokhome (2014) that many university employees approaching retirement phase of employment cycle are at risk of not having access to their contributions. The shortfalls emanating from contribution default is a confirmation of while many employees are stranded at retirement phase of employment. This result confirms the empty RSAs in many states by Uwah (2021) and Adeyele & Maiturare (2012) that the present pension scheme is gradually becoming insolvent.

The findings in this study have clearly indicated the amount of pension liabilities due as at 2020 is N191,687,720.46. Both employees and employers have their share of blame. The employers are not doing well by not remitting all funds to those who have submitted their RSAs while employees that have not submitted their RSAs to enable their employers to make necessary payments to them are also at fault. The apportionment of these liabilities to participating universities are as follows: University of Jos, N21,480,115.90; Federal University Lokoja, N106,142,436.20; University of Ilorin, N56,632,637.18; and Federal University of Technology Minna, N7,432,531.18.

In respect of pension funds valuation, this study reveals that the current employees with no funds being remitted to their retirement saving accounts as and when due may lose substantial amounts as long as default continues. It also shows the corresponding liabilities to employers if the default is deliberate. Both the invested funds and nominal funds are shown for policy implication in the retirement landscape.

This study has in fact contributed to existing pension literature by taking a holistic approach to how pension shortfalls can be recovered. Hence, this study will no doubt assist government with estimated pension shortfalls it needs to pay and the type of payment method to be employed. Also, employees with the similar characteristics described in this study will understand how their funds growth with time and what to be lost for not having their pension contribution remitted to their retirement saving accounts as and when due.

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Appendix

Table 1a: Number of Years in Pension Contribution Default for Employees with RSAs

		Institutions				Total
		University of Jos	Federal University Lokoja	University of Ilorin	Federal University of Technology Minna	
Number of years in default	1.00	0	0	20	0	20
	2.00	16	25	17	14	72
	3.00	3	36	10	0	49
	4.00	2	50	15	0	67
	5.00	2	9	3	0	14
	6.00	1	0	3	0	4
	7.00	0	0	3	0	3
Total		24	120	71	14	229

Source: Authors' Computation.

Table 1b: Number of Years in Pension Contribution Default for Employees Without RSAs

		Selected Federal Universities			Total
		University of Jos	University of Ilorin	Federal University of Technology Minna	
Total number of years of contribution	1.00	0	0	1	1
	2.00	0	0	1	1
	3.00	0	1	0	1
	6.00	0	2	0	2
	7.00	0	1	0	1
	8.00	0	3	0	3
	10.00	15	1	0	16
	12.00	0	5	1	6
Total		15	13	3	31

Source: Authors' Computation.