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Adegbite, Tajudeen Adejare, and Adegbayibi, Adesanmi Timothy

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**Adegbite, Tajudeen Adejare
Adegbayibi, Adesanmi Timothy**

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Abstract

This study examines the impact of tax income on government contributions to pension and gratuities in Nigeria. Data were mainly sourced from the bulletin of Nigeria Central Bank from 1981 to 2021. The sourced and gathered data were scrutinized thoroughly with VECM, regression, and selected lag package as well as the Co-integration (JFIC) test, Normality test, and test of stability. It was discovered that tax impacted pension and gratuities positively. Also, oil revenue enhances the prompt payment of pensions and gratuities in Nigeria. The income from the federation account and Federal retained income also impacted pension and gratuities positively, statistically, and insignificantly. Government expenditure has been discovered to have a positive influence on pensions and gratuities. Conclusively, taxation income has a positive significant, statistical, and economic influence on government contribution to Pensions and gratuities in Nigeria both in the short and long run. It is recommended that once the pension and the gratuity are the lasting hope of the retirees to readjust themselves properly after retiring from employment, the government should remit a certain percentage from tax income monthly and regularly in proportion to retirees' numbers so that the payment of pensions and gratuities will not be delayed when the needs arise.

Keywords: Tax income, government contributions, pensions and gratuities, oil revenue; federation account

JEL Classification: H200; H550; H270;

Introduction

Pension scheme management in Nigeria was previously inundated with multiple problems such as insufficient funding, grants, and subventions, budgetary constraints, pension payment challenges such as poor filling and documentation, accumulated arrears problem, inability to determination of appropriate investment portfolios, absence of accountability, embezzlement, and corruption as well as cumbersome clearance processes which also including inhumane relations by pension staff. But, this prompted the government to change the way by which pension schemes are controlled and managed as well as the ways benefits are dispersed to pensioners because of the difficulties and obstacles connected with the old pension schemes. Nigerian government opted for contributory pension schemes in 2004 when employers and their employees are mandated to contribute certain and acceptable percentages monthly from their earnings

to the Retirement Savings Account (RSA), where pension benefits would be drawn after retirement. RSA reveals money saved or contributed during employment periods and complements it with interest to a retiree after retirement from employment (Ishola, 2022). According to Madukwe & Okeke, (2022), Nigeria reformed the pension scheme recently to bridge the inconsistencies that emanated from noncontributory pension schemes which exposed many retirees to dangers, malnutrition, insecurity, and scavenging. Government or employers and employee contributes 10% and 8% respectively at the end of the month into the established pension RSA. This shows the Nigerian government's eagerness and readiness to meet financing obligations to the retirees at the end of their services, and to make life favourable and comfortable for the pensioners (Balogun, 2018).

To fulfil the acceptable percentage contributions by the government to the pension company, the government needs income or revenue regularly to earmark her contribution monthly. According to Adegbite, (2021), the government realizes income from taxes to finance both current expenditures such as gratuities and pensions, and capital expenditure of the government. According to CBN (2021), the government realized ₦565.7 billions from taxes revenue while the expenditure on pensions and gratuities is ₦72.20 billion. Income garnered from taxation by the government increased to ₦1,907.6 billion in 2010 which was a 337% increment while the income expended on pensions were ₦183.48 billion which was a 254.5% increment. But in 2011, 2012 and 2013, the expenditure of the government on pensions reduced drastically to 131.52 billion, ₦147.10 billion and ₦139.70 billion respectively while the income from taxation increased to ₦2,237.9 billion, ₦2,628.8 billion and ₦2,950.6 billion respectively. But in 2014 and 2020, the expenditure of the government on pension and gratuity was upsurged to ₦182.81 billion and ₦359.60 billion while the income realized from taxation was ₦275.0 billion and ₦4,543.60 billion respectively.

Recently, Nigerian pensioners protested for nonpayment of their gratuities and pensions which had caused a lot of damage in their life in terms of insecurity, lack of feeding, sickness, fall in standard of living and untimely deaths. The delay in the payment of gratuities and pensions has dispensed untold hardship, death, scavenging, homeless and sickness to many retirees which has been traced to ineffective planning and management problems of the government thereby making retirement issues dreaded to workers in the country. Also, the inefficient and inadequate pension system of the government has resulted in life and well-being deterioration for Nigerian pensioners. The pension scheme was reformed according to Madukwe & Okeke, (2022) with the motive of improving and providing a lasting solution to old pension problems and serving as a redistributing channel of income from the government to retirees after spending stipulated years of service in the state or nation but the reverse is appalling and horrendous. Despite income realized from taxation apart from oil revenue, there is still a backlog of gratuities and pensions' fulfilment which had resulted in huge pension liabilities for many years. Is the tax income not sufficient to offset the payment of the gratuities and pensions liabilities in Nigeria? This study is therefore established to gauge the impact of taxation income on government contributions to the pension and gratuity of the pensioners in Nigeria. The contribution of the government on the payment of monthly pension and gratuity of the retirees through the income realized from taxation is essential to be examined. Therefore, this paper examines the connection between incomes from taxation and pension funds' contributions by the government.

2. Literature Review

2.1 Concept of Pension and Gratuity

Pension is referred to as the periodic annuity or income payment made by the government to employees, who served the government extensively, after retirement and are eligible for benefits through earnings, service and age. It is also referred to as a fixed amount paid regularly and monthly by the government to retirees who voluntarily or compulsorily withdraw from government service. According to Daniel, (2022), a pension is considered as the sum of income paid regularly and monthly by employers to former employees who had served the employers for many years and retired from service either through the maximum age or service years as well as disabilities, sickness or widowhood. The main importance of pension funds is the provision of means for employees who accumulated savings during the productive working life in preparing for income needed for consumption after retirement (Ichingwa & Mbithi, 2017). Previously, the pension fund was fully managed by the government when it was a noncontributory pension scheme. But due to the inconsistency in the scheme, it was reformed by the government into a contributory pension scheme in which government or employer pays 10% and the employee contributes 8% at the end of the month to the established pension collectors (RSA). According to Ichingwa & Mbithi, (2017), an employee's age is an important determinant of the amount contributed to RSA which invariably dispenses pension funds after retirement. This means that employees who have more years in service remitted income tremendously to RSA before retirement. This also implies that financial resources contributed would be directed into investment activities tremendously after retirement.

Pension, according to Fapohunda, (2013), referred to the amount deliberately set aside by employers or employees to ensure after retirement, something is available for employees to support their standard of living and ensures that retirees are not stranded financially. In addition, It provides retirees with financial security by structuring plans that guarantee income capacity for the retiree or the dependants if the death occurs before the completion of active services. The pension scheme's purpose is the provision of formidable and reasonable social security for a retiree who has fulfilled his active services' righteousness for long periods to the government or employer. It is also a tool engaged by employers to manage employment and retain labour productivity and efficiency. Folayan et al., (2020) pointed out that pension is a motivating factor that enhances high employee productivity, discipline and loyalty in any establishment. It was further stated that to enforce obligatory saving for life after retirement, the government has devised various schemes and policies which enhance the pensioners' standard of living after retirement.

2.2 Hypotheses Development Taxation

Taxation is defined as the levying of obligatory contributions by private organisations to the government purse for effective utilization of government expenditures such as payment of salaries, pensions, gratuity and other capital expenditures for the well-being of the populace. The essence of tax collection by the government is to provide essential and certain services to the citizenry which can be more efficiently and effectively provided by the government rather than individuals (Adegbite & Ishola, 2022; Adegbite & Azeez, 2022; Chude & Chude, 2015). According to Adegbite et al., (2021), taxation is a reliable source of revenue realization for the government for the provision of essential services for the people residing in a specific geographical area. Afuberon and Okoye, (2018) revealed that taxation produces revenue to regulate production, regulate the

consumption of products, stabilize the economy, protect and defend infant industries, lessen income inequality, and payment of the employee benefits such as pension and gratuity among others. A good tax system is considered the veritable tool employed by the government to mobilize the country's internal resources with the motive of creating an enabling environment for all sectors to grow in the economy (Adegbite, 2015). When taxes collection is efficiently, effectively and productively administered, revenue generation is increased thereby increasing the taxation income exhausted by the government on the payment of gratuity and pensions to the retirees which invariably increases retirees' standard of living. Therefore it is postulated that:

H₁: Tax income enhances the payment of pensions significantly in Nigeria

il Revenue

This refers to the income realized by the government on the sales of crude oil globally. The oil boom in Nigeria in 2005 ignited the country to discard the full involvement of taxation in economic financing. The government realized tremendous income from oil revenues to offset all expenditures of the government. Oil revenue is a vital component of revenue generation with the motive of economic stabilization, national output increment, public expenditure financing, allocation of resources, and enhancement of investment as well as payment of recurrent expenditures such as pension and gratuity investment (Adegbite, 2013). Also, through oil revenue, government achieves macroeconomic objectives such as employment generation, stable price levels, economic growth, external balance, and resource allocation. Records displayed that oil prices decline recently has dispensed insufficient funds for the government to cater for all the expenditures in Nigeria. It has been discovered by Aminu et al., (2020) that oil revenue in Nigeria provides vital roles and functions in the achievement of current expenditures where the payment of pension and gratuity has been fulfilled. Therefore, it is postulated that:

H₂: Oil Revenue enhances the payment of pensions significantly in Nigeria

Federation Account (FEDACCT)

This is referred to as the special account in which all federal government revenue collected is kept except for PAYE income from Police Personnel, Army Personnel (AP), offers of Foreign services, and FCT (Abuja) Residents as well as the revenue from Federal Government Independent Revenue (FGIR) which include mining, interest and repayment, internal revenue, fees, licenses, sales, and earnings rent, audit fees reimbursement, government properties, revenue from AP Property disposal, and miscellaneous. All monies in this account are shared among state, local and federal governments in Nigeria. According to Omodero, (2019), the government realized income from the federation account which is jointly owned by all the tiers of government in Nigeria to cater for all her expenditures such as pension and gratuity. That is, an increment in federal government shared from the federation account can lead to an increase in expenditure of government on pension and gratuity in Nigeria and vice visa. When revenue from the federation account is shared, the federal government is monetary powered to fulfil all the righteousness concerning pension and gratuity responsibilities in the country. Therefore, it is postulated that:

H₃: Federation account enhances the payment of pensions significantly in Nigeria

Federal Government Retained Revenue (FEDRTAIN)

Retained earnings referred to other government sources of revenue which is the revenue accumulated by the government for expansion, growth, diversification, investment activities, and financing of expenditures of the government. The expenditure of the government can be financed thoroughly through retained revenue of the federal government. The unspent revenues from the preceding years can be exhausted on the fulfilment of recurrent expenditure such as payment of pension and gratuity, and other pressing recurrent expenditure. The government sometimes retained certain percentages of revenue realized to offset pressing expenditures in the future in Nigeria. it is therefore postulated that FEDRTAIN assists the government in financing expenditure on pensions and gratuity. Therefore, it is also hypothesized that:

H₄: Federal Government Retained Revenue enhances the payment of pensions significantly in Nigeria

Government Expenditure (GOVEXP)

This refers to the expenditure of the government on investment, consumption, transfer payment, and payment of salaries. This is bifurcated into capital and recurrent expenditure. That is, the expenditures of government include spending or expenses on capital and recurrent expenditure. The investment and economic situation of the country is affected or influenced by government expenditure. According to Bappahyaya et al., (2021) government spending on pensions and other recurrent expenditure increase government expenditure significantly. It was stated further that the indispensable mindset of government on the life of the pensioners and retirees prompted an increment in government expenditure on pensions and gratuities. Therefore, it is hypothesized that:

H₅: Government Expenditure enhances the payment of pensions significantly in Nigeria

Conceptual Framework



Fig 1: Conceptual Framework
Source: Researcher's Design (2023)

2.3 Theoretical Review

2.3.1 Fiscal Federation Theory (FFT)

This was propounded by Musgrave, (1959) and advocated by Arrow, (1974). The theory provided the edifice for an appropriate government role in an economy. According to the theory, three roles and responsibilities are expected from the government within the framework which includes the roles of market failure correction, income equitable distribution and economic stability maintenance at stable prices and full employment.

The shortfall of this theory is that the allocated yardsticks on the income equitable distribution roles of the government and market failure correction roles are not explicitly discussed. The relevance of this theory to this study is that through income equitable distribution roles, the government are saddled with prompt payment of the benefits of the retirees and their pension after a long service year with the government. The government, according to FFT, are mandatory to put in place all the devices to fulfil all righteousness on the payment of pension and gratuity to the pensioners.

2.3.2 Finance Theory (FT)

FT covers three (3) main areas such as budgeting, working capital management (WCM), and capital structure. According to this theory, the decision on capital structure and capital budgeting are related to managing and financing long-term investments but WCM is concerned with financial decisions that are related to working capital and financing of short-term investments embedded with both current liabilities and current assets simultaneously (Amu & Millegard, 2009). FT stated that the government budgeted for the payment of pensions and gratuities to enhance the performance of the pensioners. The more the budget for pension and gratuity the better the life of the pensioners after retirement when fully and productively implemented. Also, the contributory pension, if it is capially structured, and invested, the returns to the contributors increases, and maximizes the wealth of the pensioners or retirees. The relevance of finance theory to this study is that the theory indicated the efforts of the government on the inclusiveness of pensions in the year budget under the recurrent expenditure, and the capital structures in terms of investment of the contributions of the pensions which enhance absolutely life and welfare of pensioners. Therefore, this study is connected and anchored on FT theory and FFT theory to achieve the motive of this study.

2.4 Empirical Review

Ichingwa & Mbithi, (2017) analyzed the total contribution effect on Kenya's pension schemes' financial performance. The targeted population was gathered from eight hundred and eighteen (818) pension schemes (PS) which were registered under Kenya occupational PS as of 2016 and two hundred and sixty-one were randomly selected. The study employed secondary data which was gathered from all 261 registered pension schemes. The collected data were analyzed with correlation and descriptive statistics. The outcome of the analysis recognized a positive significant effect of total contribution on Kenya pension schemes' financial performance. However, the study emanated from Kenya but not Nigeria, therefore, the policy is domiciled in Kenya which is not extended to Nigeria. Danquah, (2019) examined pension funds' effect on Ghana's emerging economy with a focus on Ghana's flagship Pensions scheme's operations. National Insurance Trusts and Social Security senior officers were purposively and technically sampled among Ghana's flagship Pensions scheme's operations. Questionnaires were administered to tap relevant data from selected officers which were analyzed with descriptive. The finding showed that pension funds had a positive effect on corporations' stocks, purchased government bonds, infrastructural growth, health, and education as well as security which included economic housing in Ghana. This study was carried out on Ghana's economy but not on the taxation effect on government contributions to pension of the retirees in Nigeria.

Chovancova et al., (2019) investigated the connection between the stock market and pension funds. Research data was garnered from OECD members. The data composed from OECD members and the world index were analyzed with regression. The study

concluded that pension funds significantly correlated and impacted fixed-income securities and stock indices significantly in OECD members. However, the study was only applicable to OECD countries in which Nigeria is not inclusive. In another study, Folayan et al., (2020) examined pension reform's effect on Okeogun pensioners' standards of livings in Oyo state, Nigeria. The study realized and analyzed data through 150 questionnaires of pensioners which were purposively selected in selected five (5) Okeogun local government councils within Oke Ogun, and regression analysis respectively. The study discovered through regression results that pension scheme reforms impacted the standard of living of pensioners significantly and positively but pensioners were inadequately educated on pension reforms in the Oke Ogun axis of Oyo state. The study was directed to Oyo state but not Nigeria as a whole.

Zubair, (2021) examined pension fund (PF) investment's impact on capital market (CM) performance from quarter three (Q3) of the year 2009 to quarter one (Q1) year 2016. Data realized from the Financial Statistical Bulletin, CBN quarterly reports, World Bank, and National Bureau of Statistics Nigeria as well as Pension Commission quarterly reports were analyzed with autoregressive (AR) regression technique. The advocacy of the study was that PF investments possessed a significant positive impact on CM performance which ultimately enhanced the value traded and market capitalization of Nigeria's capital market. Thus, the study was limited to capital market performance but it was not elongated to taxation impact on pension. Also, Daniel, (2022) analyzed the pension scheme's effect on retirees' socioeconomic development. The study employed a questionnaire as the instrument to gather the relevant data from retirees in North central state, Nigeria. One thousand, two hundred and forty (1,240) respondents were sampled which were selected from four Plateau state's local governments. The selected sample embedded with two hundred (200) retirees who were from the federal government, one hundred and fifty (150) were also from the state government while twenty-five retirees, fifty (50) retirees, and fifteen retirees were from the retirees of local government, Health service staff, and University staff respectively as well as eight hundred (800) were from beneficiaries. ANOVA was also engaged for the data analysis which displayed that pension schemes impacted plateau state pensioners' livelihood and socioeconomic development significantly and positively. However, the study focused on a single state in North Central, Nigeria which engaged the questionnaire as absolutely different to the current study.

Madukwe & Okeke, (2022) investigated the inflation effect on Nigeria's pension fund investment (NPFI) from 2007 to 2019. Data which were realized from the Annual Reports of CBN and the National Pension Commission were analyzed with a unit root, ADF and regression. The findings displayed that the inflation rate was significantly irrelevant to NPFI. But pension funds invested in Investment Companies adequately provided a return on investment which cushioned the effect of inflation on NPFI in Nigeria. The study concluded that inflation had no significant effect on NPFI. But the study's scope was on the inflation effect on Nigeria's pension fund investment which was far away from the content of this study. Becker et al., (2023) in their study provided novel confirmation on employment pension wealth elasticity. For the obvious identification, the study exploited reform-induced pension wealth variation but which did not affect employment implicit tax rate. The study employed a difference-in-differences estimator based on German pension insurance administrative data. According to the outcome of the study, negative employment affected pension wealth economically and significantly. It was stated further that employment effects were motivated by the behavioural

reactions of employees close to retirement. Thus, the study captured pension effects on employment in Germany but its outcome was immature to Nigeria's pension.

2.5 Research Gap

The economic recession has dispensed a reduction in government revenues and reduced the government's ability in ensuring retirees' satisfactory standards of living through contributory pension schemes. Pension and gratuity represent the two utmost assets for retirees and pensioners. But at present, it has become a daily theme of discussion in the country because of the disgusting experience of both pensioners and retirees on the outputs of pension schemes. There are many studies on pension and gratuity in Nigeria such as Madukwe & Okeke, (2022) who investigated the inflation effect on Nigeria's pension fund investment (NPFII) from 2007 to 2019; Zubair, (2021) whose study was limited to capital market performance, and Daniel, (2022) with the study focused a single state in North central, Nigeria which also engaged questionnaire as the only and major instrument for the study, as well as others who limited their studies to socio-economic development, inflation, capital market performance, and standard of living (Becker et al., 2023, Folayan et al., 2020). Nevertheless, none of the existing researchers examined or investigated how government employ taxation to offset the backlog payment of pensions and gratuities in Nigeria. However, the source of the income on effective implementation of the contributory pension is not touched and examined. Further, the existing studies and literature which limited their studies to pension effects on retirees and pensioners, socio-economic development, inflation, capital market performance, pension financial performance schemes, and standards of living of the pensioners were also confined to their studies' scope to 2019. Also, the methodology involved in terms of collection and analysis was also limited to primary data and ANOVA respectively by the extant literature and researchers. Therefore, this study examines the connection between incomes from taxation, and pension funds contributions by the government. The relationship between pension funds and income from taxation is also analyzed. In addition, this study employs time series' analytical logistics to analyse the data gathered for this study which makes it globally unique.

3. Methodology

The necessary data required to address the issues under discussion were sourced from secondary sources. The data used were sourced from Annual reports of CBN which covered 41 years (1981 to 2021). These years were chosen because many different policies have been postulated by the federal government on pension reforms, and taxation in Nigeria. It was during these years that labour unrests were paramount due to non-payment of the pensions and gratuities for the retirees in the country. Also, Nigeria also experienced peaceful demonstrations of the retirees because of the maltreatment of the retirees by the pension administrators during the periods in the country. The sourced and gathered data were scrutinized thoroughly with the Vector Error Correction (VEC) Model, regression, and selected lag package as well as the Co-integration (JFTC) test, Normality test and test of stability. The data analysis for the study takes the following steps:

i. Unit root tests

Unit root test is employed to examine the stationary of the variables involved in the study. If the variables are stationary at level, it does not need to go further to test for the first level difference, but otherwise, the first level difference of the variables is tested.

ii. Post-estimation diagnostic tests

Selection Order Criteria (SOC) was also involved in the study to gauge the appropriate lags to be employed in the study to avoid overestimation and underestimation of lags which can dispense spurious results. Normality and stability tests were also involved in the study to examine the normality and stability of the variables' data respectively.

iii. Co-integration test

After discovering that the variables are stationary in the first level, this necessitates testing for Co-integration to determine the numbers of co-integration vectors and equations in the study. This test displays the numbers of co-integration vectors and equations in the study which shows that the variables under study are co-integrated.

iv. Vector error correction model

This test is done after realising the variables under study are co-integrated. It displays the short and long-run effects of independent variables on the dependent variable.

3.1 Model specification

To examine taxation effects on government contributions on pensions and gratuities in Nigeria, taxation, federation account (FEDACCT), Federal Government Retained Revenue (FEDRTAIN), oil revenue and government expenditure (GOVEXP) are the independent variables while pension (PENSGRAT) is the dependent variable. Taxation income is measured as the aggregate of all income realized from taxes such as VAT, company income tax, capital gained tax, PPT, customs and excise duties, and other taxes collected by the federal government. Oil revenue is also measured as the total income realized from the sale of crude oil both onshore and offshore streams. FEDRTAIN was realized through CBN statistical bulletin as the revenue accumulated and residual income unspent which are reserved for exigency in the country. The federation account was measured as the total income or revenue shared by the federal government from the joint account of all the three tiers of government in Nigeria which include mining, interest and repayment, internal revenue, fees, licenses, sales, and earnings rent from audit fees reimbursement, government properties, revenue from AP Property disposal, and miscellaneous. All monies in this account are shared among state, local and federal governments in Nigeria. GOVEXP is measured as the sum of the income expended on investment, consumption, transfer payment, and payment of salaries. This is bifurcated into capital and recurrent expenditure. That is the expenditures of government include spending or expenses on capital and recurrent expenditure.

Thus, the models of the study are specified in linear forms below:

$$\text{Pensgrat} = f(\text{Tax}) \tag{1}$$

The functional relationship is in the form:

$$\text{Pensgrat} = f(\text{Tax}, \text{Oilrev}, \text{Fedacct}, \text{Fedrtain}, \text{GOVEXP } \mu) \tag{2}$$

Using multiple regression analysis, the model was modified as follows;

$$\text{Pensgrat} = \beta_0 + \beta_1\text{tax} + \beta_2\text{oilrev} + \beta_3\text{genadmi} + \beta_4\text{fedrtain} + \text{GOVEXP} + \mu \tag{3}$$

VECM model is as follows:

$$\Delta \text{PENSGRAT}_t = \alpha + \sum_{i=1}^{k-1} \beta_i \Delta \text{PENSGRAT}_{t-i} + \sum_{m=1}^{k-1} \phi_m \Delta \text{TAX}_{t-m} + \sum_{n=1}^{k-1} \phi_n \Delta \text{OILREV}_{t-n} + \sum_{j=1}^{k-1} \phi_j \Delta \text{FEDACCT}_{t-j} + \sum_{s=1}^{k-1} \phi_s \Delta \text{FEDRTAIN}_{t-s} + \sum_{s=1}^{k-1} \phi_n \Delta \text{GOVEXP}_{t-s} + \lambda \text{ECT}_{t-1} + \mu_{2t} \quad (4)$$

$$\Delta \text{TAX}_t = \alpha + \sum_{i=1}^{k-1} \beta_i \Delta \text{PENSGRAT}_{t-i} + \sum_{m=1}^{k-1} \phi_m \Delta \text{TAX}_{t-m} + \sum_{n=1}^{k-1} \phi_n \Delta \text{OILREV}_{t-n} + \sum_{j=1}^{k-1} \phi_j \Delta \text{FEDACCT}_{t-j} + \sum_{s=1}^{k-1} \phi_n \Delta \text{FEDRTAIN}_{t-s} + \sum_{s=1}^{k-1} \phi_n \Delta \text{GOVEXP}_{t-s} + \lambda \text{ECT}_{t-1} + \mu_{3t} \quad (5)$$

$$\Delta \text{OILREV}_t = \alpha + \sum_{i=1}^{k-1} \beta_i \Delta \text{PENSGRAT}_{t-i} + \sum_{m=1}^{k-1} \phi_m \Delta \text{TAX}_{t-m} + \sum_{n=1}^{k-1} \phi_n \Delta \text{OILREV}_{t-n} + \sum_{j=1}^{k-1} \phi_j \Delta \text{FEDACCT}_{t-j} + \sum_{s=1}^{k-1} \phi_n \Delta \text{FEDRTAIN}_{t-s} + \sum_{s=1}^{k-1} \phi_n \Delta \text{GOVEXP}_{t-s} + \lambda \text{ECT}_{t-1} + \mu_{4t} \quad (6)$$

$$\Delta \text{FEDACCT}_t = \alpha + \sum_{i=1}^{k-1} \beta_i \Delta \text{PENSGRAT}_{t-i} + \sum_{m=1}^{k-1} \phi_m \Delta \text{TAX}_{t-m} + \sum_{n=1}^{k-1} \phi_n \Delta \text{OILREV}_{t-n} + \sum_{j=1}^{k-1} \phi_j \Delta \text{FEDACCT}_{t-j} + \sum_{s=1}^{k-1} \phi_n \Delta \text{FEDRTAIN}_{t-s} + \sum_{s=1}^{k-1} \phi_n \Delta \text{GOVEXP}_{t-s} + \lambda \text{ECT}_{t-1} + \mu_{5t} \quad (7)$$

$$\Delta \text{FEDRTAIN}_t = \alpha + \sum_{i=1}^{k-1} \beta_i \Delta \text{PENSGRAT}_{t-i} + \sum_{m=1}^{k-1} \phi_m \Delta \text{TAX}_{t-m} + \sum_{n=1}^{k-1} \phi_n \Delta \text{OILREV}_{t-n} + \sum_{j=1}^{k-1} \phi_j \Delta \text{FEDACCT}_{t-j} + \sum_{s=1}^{k-1} \phi_n \Delta \text{FEDRTAIN}_{t-s} + \sum_{s=1}^{k-1} \phi_n \Delta \text{GOVEXP}_{t-s} + \lambda \text{ECT}_{t-1} + \mu_{6t} \quad (8)$$

$$\Delta \text{GOVEXP}_t = \alpha + \sum_{i=1}^{k-1} \beta_i \Delta \text{PENSGRAT}_{t-i} + \sum_{m=1}^{k-1} \phi_m \Delta \text{TAX}_{t-m} + \sum_{n=1}^{k-1} \phi_n \Delta \text{OILREV}_{t-n} + \sum_{j=1}^{k-1} \phi_j \Delta \text{FEDACCT}_{t-j} + \sum_{s=1}^{k-1} \phi_n \Delta \text{FEDRTAIN}_{t-s} + \sum_{s=1}^{k-1} \phi_n \Delta \text{GOVEXP}_{t-s} + \lambda \text{ECT}_{t-1} + \mu_{6t} \quad (9)$$

Where PENSGRAT proxied as federal government contributions to Pensions and Gratuities. α are intercepts, β_i , ϕ_i , ϕ_m , ϕ_n and ϕ_s are the coefficients of PENSGRAT, FEDACCT, TAX, OILREV and FEDRTAIN respectively. μ_{1-6t} are error terms.

Where as

TAX	-	Taxation
OILREV	-	Oil Revenue
FEDACCT	-	Federation Account
FEDRTAIN	-	Federal Retain
GOVEXP	-	Government Expenditure

4. Results and Discussion

Table 1: Variance Inflation Factor

VARIABLE	VIF	1/VIF
TAX	2.71	0.36
OILREV	1.62	0.61
FEDACCT	1.82	0.55
FEDRTAIN	2.76	0.36
GOVEXP	3.73	0.26
Mean VIF	2.53	

Source: Authors' Computation (2023)

Table 1 was employed to examine the multicollinearity of the incorporated variables. It was discovered that none of the incorporated variables involved fell victim to multicollinearity. The decision was advocated because of VIF values of all incorporated variables fell below 10.

Table 2: Unit Root (UR) Test

Variables	ADF stat	1% critical value	5% critical value	10% critical value	Order of integration	p-value	Remark
PENSGRAT	4.691	-3.662	-2.964	-2.614	I(1)	0.0001	Stationary
TAX	4.418	-3.662	-2.964	-2.614	I(1)	0.0003	Stationary
OILREV	4.729	-3.662	-2.964	-2.614	I(1)	0.0001	Stationary
FEDACCT	6.547	-3.662	-2.964	-2.614	I(1)	0.0001	Stationary
FEDRTAIN	4.202	-3.662	-2.964	-2.614	I(1)	0.0001	Stationary
GOVEXP	5.025	-3.662	-2.964	-2.614	I(1)	0.0000	Stationary

(*), (**) and (***) means stationary at 1%, 5% and 10% respectively

Source: Authors' Computation (2023)

Unit root was tested as it was divulged in Table 2 that all the variables involved to examine the taxation effect on PENSGRAT were stationary at the first level. This divulged that there are elements of long-run connection among all the variables involved in the study. This solicits for the test of stationary of Residuals to deduce the long-run relationship of tax income and PENSGRAT.

Table 2.1: Stationary of Residuals

Variables	Test Statistic	1% critical value	5% critical value	10% critical value	Order of integration	p-value	Remark
Predict u, Residual	-3.963	-3.655	-2.961	-2.613	I(0)	0.0016	Stationary
y	-3.662	-3.668	-2.966	-2.616	I(0)	0.0047	Stationary

Source: Authors' Computation (2023)

Table 2.1 displayed the stationary of residuals, it was discovered that residuals are stationary at level. This dispenses that there is a long-run effect of taxation income on the contribution of the government on pensions and gratuities in Nigeria. This solicits for the test of lag selection to rightly without flaw choose the best lag for the study. This is also supported by the graph shown below.

Figure 1: Stationary of Residuals

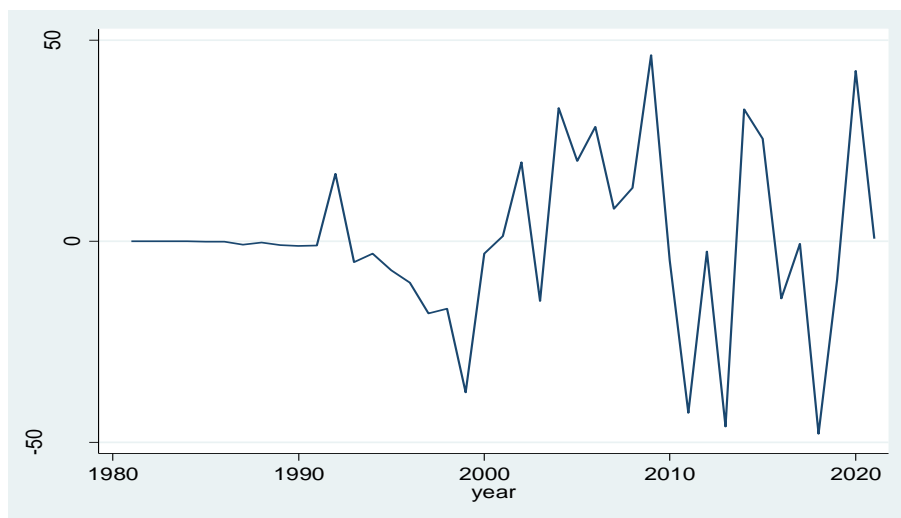


Table 3: Selection Order Criteria (SOC)

Lag	LL	LR	Df	P	FPE	AIC	HQIC	SBIC
0	-170.944				.00929	9.5105	9.58724	9.72819
1	-44.175	253.54	36	0.000	.000038	4.00946	4.46994	5.31561
2	-16.6561	55.038	36	0.000	.000036	3.8733	4.71751	6.26791
3	14.7683	62.849	36	0.000	.000032	3.52604	4.75398	7.0091
4	55.2357	80.935*	36	0.000	.000022*	2.68996*	4.30164*	7.26149*

Endogenous: PENSGRAT, TAX, OILREV, FEDACCT, FEDRTAIN

Exogenous: _cons Source: Authors' Computation (2023)

SOC test was done and shown in Table 3. Different criteria were displayed in Table 2, such as FPE, AIC, HQIC, and SBIC. The function of these criteria is the right selection of the best lag for the study. All the criteria are on the same page of the selection, that is, all of the criterion selected lag 4 as indicated by the *

Table 4: Tax Income Impact on Pensions and Gratuities in Nigeria

PENSGRAT	Regression At Level	Regression At First Difference
TAX	-0.2365 (0.0185)	0.1105*** (0.023)
OILREV	-0.54987* (0.00488)	0.02955*** (0.006)
FEDACCT	0.3984** (0.0708)	0.148*** (0.001)
FEDRTAIN	0.0510* (0.0158)	0.0310*** (0.022)
GOVEXP	0.4537 (0.0109)	0.0147*** (0.011)
_cons	-0.0105 (0.0185)	0.187 (0.000)
N	41	41
R ²	0.891	0.691
adj. R ²	0.832	0.632

Source: Authors' Computation (2023)

As it was shown in Table 4, the first column which is regression at level was rejected based on the nonstationary of all the variables incorporated into the study. This was corrected through regression at first difference. According to Regression at the first difference, a 1% increase in TAX increases PENSGRAT by 0.11% which signifies a positive significant contribution of TAX on PENSGRAT ($\beta = 0.1105$, $P > |t| = 0.023$). A 1% increase in OILREV increases (PENSGRAT) by 0.02%, that is OILREV has a positive significant influence on PENSGRAT ($\beta = 0.02955$, $P > |t| = 0.006$). This means that if OILREV increases PENSGRAT increases. It was also discovered from Table 4 that a 1% increase in FEDACCT increases PENSGRAT by 0.14% which also signifies a positive significant contribution of FEDACCT on PENSGRAT ($\beta = 0.148$, $P > |t| = 0.001$). FEDRTAIN has further been discovered to have a positive significant contribution on PENSGRAT, that is, a 1% increase in FEDRTAIN increases PENSGRAT by 0.03%. ($\beta = 0.0310$, $P > |t| = 0.022$). Lastly, GOVEXP has been seen to have a positive significant effect on PENSGRAT ($\beta = 0.147$, $P > |t| = 0.011$). Given the Adjusted R² of 83.2%, it

advocates that the model specified in this study is sufficient in determining s the good model fit for this study.

Table 5: Johnson Test for Co-integration (JFTC)

Rank	Parms	LL	Eigenvalue	Trace statistic	5% Critical value
0	6	-1597.0368	.	229.7593	94.15
1	17	-1550.184	0.90393	136.0537	68.52
2	26	-1526.9639	0.68683	89.6136	47.21
3	33	-1507.287	0.62613	50.2597	29.68
4	38	-1489.6623	0.58573	15.0103*	15.41
5	41	-1482.2464	0.30981	0.1786	3.76
6	42	-1482.1571	0.00445		

Source: Authors' Computation (2023)

To discard the null hypothesis of no existence of a cointegration equation in the study, JFTC was engaged. It was discovered that there are four or more cointegration equations in the study because "Rank 4" in Table 5 shows a trace statistic of 15.0103* below the 5% critical value of 15.41. This advocates that there are one or more cointegration equations of vectors in the study. This also dispenses that a long-run connection existed between PENSGRAT and other variables involved.

Table 6: VEC Model

Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_ PENSGRAT	8	17.8681	0.6659	61.79873	0.0000
D_ TAX	8	1028.29	0.4151	21.99864	0.0049
D_ OILREV	8	157.09	0.8679	203.7223	0.0000
D_ FEDACCT	8	65.7649	0.4085	21.41142	0.0061
D_ FEDRTAIN	8	331.045	0.5138	32.75434	0.0001
D_ GOVEXP	8	320.874	0.7696	103.5479	0.0000
Log-likelihood =	Det(Sigma_ml) =	AIC	HQIC	SBIC	
34.16735-	1.09e-07	= 2.963927	= 4.330014	=	6.838837
2096.214					

Source: Authors' Computation (2023)

Table 6 displayed the short-run effect and relationship among the dependent variable (PENSGRAT), tax and other independent variables. It is discovered that all variables possessed positive significant effects with PENSGRAT because P>chi2 of the highest variable possesses the value of 0.0061 which is invariably less than 0.05. This advocated that there is a short-run effect of tax income and other variables involved in PENSGRAT in Nigeria.

Table 7: Johansen Normalization Restriction Imposed (JNRI) (long run effect)

Beta	Coefficient	Std Error	Z	P> z	[95% Conf. Interval]
_ce1					
PENSGRAT 1

TAX	-.2368337	.0247139	-9.58	0.000	-.2852721	-.1883953
OILREV	-.036257	.0076526	-4.74	0.000	-.0512557	-.0212582
FEDACCT	-.1292213	.0386890	-3.34	0.039	-.3177388	.0592961
FEDRTAIN	-.0397896	.0144165	-2.76	0.048	-.0044185	.0839977
GOVEXP	-.1624107	.0148216	-10.96	0.000	-.1914604	-.1133361
_CONS	2.945708

Source: Authors' Computation (2023)

According to JNRI, 1% increase in TAX increases PENSGRAT by 0.23%. This submits a positive significant contribution of TAX on PENSGRAT. The outcome is significant ($\beta = -.2368337$, $z = -9.58$, $P > |z| = 0.000$). A 1% increase in OILREV increases PENSGRAT by 0.036%. This means OILREV impacted PENSGRAT positively and significantly ($\beta = -.036257$, $z = -4.74$, $P > |z| = 0.000$) in the long run which dispenses that an increment in OILREV begets an increment in PENSGRAT. Furthermore, a 1% increase in FEDACCT increases PENSGRAT by 0.12% which further advocates a positive significant contribution of FEDACCT on PENSGRAT in the long run ($\beta = -.1292213$, $z = -3.34$, $P > |z| = 0.039$). Moreover, a 1% increase in FEDRTAIN increases PENSGRAT by 0.039%. This reveals a positive significant effect of FEDRTAIN on PENSGRAT ($\beta = -.0397896$, $z = -2.76$, $P > |z| = 0.048$). Lastly, a positive significant influence has been discovered from GOVEXP to PENSGRAT ($\beta = -.1624107$, $z = -10.96$, $P > |z| = 0.000$), that is 1% increase in GOVEXP increases PENSGRAT by 0.16%. With the outcome from Table 7, tax income and other variables involved in the model significantly, positively and economically impacted PENSGRAT.

5. Discussion of Findings

This study examines the impact of tax income on the government contributions to pensions and gratuities (PENSGRAT) in Nigeria. Data were mainly sourced from the bulletin of Nigeria's central bank from 1981 to 2021. The sourced and gathered data were scrutinized thoroughly with VECM, regression, and selected lag package as well as Co-integration (JFTC) test, Normality test and test of stability. It was discovered that TAX impacted PENSGRAT positively ($\beta = -15.25311$, $t = -8.93$, $P > |t| = 0.000$). This shows that part of the income realized from tax has been spent on the pensions and gratuities of retired workers. The policy implication is that the higher the tax income the better the fulfilment in payment of pensions and gratuities. Through tax income, the federal government possess the financial potency to offset pensions and gratuities in Nigeria. This submission is in line with the submission of Chovancova et al., (2019); Adegbite, (2018); Han & Park, (2018); and Caminada & Goudswaard, (2014). Also, OILREV enhances the prompt payment of pensions and gratuities in Nigeria. This is displayed as shown in Table 5 that the more the income realized from oil revenue, the more resources are allocated to PENSGRAT. This is further advocated that the income from the oil sector is also pertinent to the government's responsibilities on PENSGRAT. This outcome commensurates with the idea of Sanery & Preneta, (2002); Chovancova et al., (2019); Han & Park, (2018); and Caminada & Goudswaard, (2014).

The income from the federation account (FEDACCT) also impacted PENSGRAT positively, statistically and significantly. The policy implication is that income from federation accounts such as fines, and levies aside from taxes have an influence which is positive on PENSGRAT. Lastly, FEDRTAIN has been discovered to have a positive influence on PENSGRAT that is 1% increase in FEDRTAIN increases PENSGRAT by 0.15%. An increase in federal government retained earnings gives birth to an increment

in income exhausted by the government on PENSGRAT, this is in line with the advocacy of Han & Park, (2018) and Sanery & Preneta, (2002). Government expenditure was also discovered to have a positive significant influence on PENSGRAT, this shows that pensions and gratuities take a certain percentage in expenditure of government especially recurrent expenditure. That is, pensions and gratuities are embedded and bundled in government expenditure. The higher the expenditure of the government, the better is for the payment of pensions and gratuities of retirees and pensioners in Nigeria.

6. Conclusion

Tax income's impact on government contributions to pensions and gratuities in Nigeria is examined. Data were mainly sourced from the bulletin of Nigeria's central bank from 1981 to 2021. The sourced and gathered data were scrutinized thoroughly with VECM, regression, and selected lag package as well as Co-integration (JFTC) test, Normality test and test of stability. It was discovered that tax impacted pension and gratuities positively. Also, OILREV enhances the prompt payment of pensions and gratuities in Nigeria. The income from the federation account and Federal retained income also impacted pension and gratuities positively, statistically and insignificantly. Government expenditure has been discovered to have a positive influence on pensions and gratuities. Conclusively, taxation income has a positive significant, statistical and economic influence on government contribution to Pensions and gratuities in Nigeria both in the short and long run. Furthermore, taxation income plays an important and efficient role in fulfilling all the righteousness in the payment of pensions and gratuities of the pensioners in the country. That is the income earmarked for the payment of pension and gratuities are realized from taxation and other sources such as oil revenue, retained income and federation account in Nigeria.

This further assists the government in promptly paying the pensions and gratuities to the pensioners as a social security against old-age poverty, uncertainties and risks, and protection for retirees. It cannot be denied that the Nigerian government leverages the income realized from taxation to pay monthly remittances and contributions to pensions regularly in the country. This has eradicated pensioners' protests for nonpayment of their gratuities and pensions, and delaying the payment of gratuities and pensions. Taxation impact on the government contributions on monthly pensions and gratuities cannot be underestimated and underrated because it has reduced untold hardship, death, scavenging, homeless and sickness to many retirees after retirement because of the prompt collection of their gratuities and pensions for effective planning for their life.

It is recommended that once the pension and the gratuity are the lasting hope of the retirees to readjust themselves properly after retiring from employment, government should remit a certain percentage from tax income monthly and regularly in proportion to retirees' numbers so that the payment of pensions and gratuities will not be delayed when the need arises. Government must also put in place all the devices to fulfil all the righteousness through tax income on the payment of pensions and gratuities to the pensioners.

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About the Authors

Dr. Adegbite, Tajudeen Adejare, Associate Professor, Department of Accounting, Al-Hikamh University, Ilorin Kwara State, Nigeria. <adetajud@yahoo.com > ORCID: 0000-0001-7456-0172
Mr. Adegbayibi, Adesanmi Timothy, Lecturer, Department of Accounting, Adekunle Ajasin University, Akungba-Akoko, Ondo State. <Adesanmi.adegbayib@aaua.edu.ng> ORCID: 0000-0002-6330-2976
