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The Nigerian Defined Contributory Pension Scheme (CPS): An Examination of the Decumulative (payout) phase.

By

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Abstract

Studies on the pension industry and the migration to the defined contributory scheme in developed and emerging markets have been the subject of empirical debate in the last few decades. Unlike their developed counterparts, emerging and developing are often characterized by relatively low analysis due to their recency of transformation. Even though empirical studies on the accumulation of contributions have established that the Pension Reform Act 2004, as amended in 2014 establishes the contributory pension scheme (CPS) which mandates employer-employee contributions for retirement in Nigeria. As at the first quarter of 2023, the sum of 384,28 million comprising of pension contributions and penalties have been subsidized.in the accumulation phase. However, often fail to take the decumulation (payout) phase as an important issue into cognizance. Thus, the objective of this study is to empirically examine decumulative (payout) phase under the defined contributory scheme using data from Nigeria. The study utilized data from 2013 to 2021 to compute retiree, Monthly annuity, Lumpsum, Premium and Payment of death benefit for the Nigerian Pension fund. Consistent with the existing empirical evidence, the study found that retiree must be paid as and when due and thus recommended timely payment of the monthly annuity (MOA), payment of death benefit (PDB), lumpsum (LUM), and premium (PRM) to the retirees. This would facilitate the elimination of the negative and positive insignificant effect the regressors has on the regressand. The study further recommends investigation different retirement income strategies, including the use of annuities, systematic withdrawals, and other payout options, to assess their effectiveness in providing sustainable income throughout retirement

KEY WORDS: Decumulative (payout) phase, Defined Contributory Scheme, Pension Industry, Total retiree, monthly annuity, lumpsum, Premium, payment of death benefit, Error Correction Model, Johanson Co-integration Test.

1.0 Introduction

Retirement income has been an area that has been discussed by many countries due to its importance in the financing of working populace as an when due for retirement. Nigeria's pension system operates under the Pension Reform Act of 2004 and subsequent amendments. It transitioned from a defined benefit scheme (DB) to a defined contributory scheme (DC). As at July 2004 when the reform was kickstarted, national pension deficit was 2.4 trillion naira but as at September 2023 accumulated pension assets had grown to 17.3 trillion naira. In the history of economic reform in Nigeria, pension ranks among the topmost and has opened up a new economy and also expanding financial market and infrastructure development in the country. The National Pension Commission (PenCom) regulates and supervises the implementation of the pension system in Nigeria with the amended PRA 2014 and is in tune with global norms.

The performance of the Nigerian pension system has seen some improvements since the introduction of the defined contributory scheme Sambo, (2012: 2017). PenCom has been executing this mandate dutifully as evident in its policies and guidelines that have shaped the industry since 2004. Some of the defining policies are digital capture in 2018, transfer window, recapitalization of PFAs from 1 billion to 5 billion in 2021, the micro pension plan, residential mortgage based on section 89(2) of the PRA 2014 and as at 2022 guideline on how RSA holders can access 25% of their equity contribution , multi-fund investment that classifies eligibility to be places on less risky securities when approaching retirement and voluntary contribution was increased from 7.5 % employer and employee to 8% and 10% respectively. These contributed to the exponential growth of the Nigerian pension industry. (Umar, (2023); Sambo, (2023)).

Consequently, the DC eliminated uncertainty and post retirement stress due to the well-defined industry players. The system has experienced growth in pension assets and increased coverage. However, challenges remain, including issues related to administrative efficiency, transparency, and the adequacy of retirement income. In Nigeria the structure of the pension industry is clearly defined, the payout phase allows retirees to choose between programmed withdrawals, life annuities, or a combination of both. Programmed withdrawals provide periodic payments from the retiree's Retirement Savings Account (RSA), while life annuities offer a guaranteed income for life. There is a lack of empirical evidence on the effectiveness and efficiency of pension schemes in Nigeria especially in the payout phase. Most studies rely on theoretical frameworks and qualitative data, which may not provide a comprehensive understanding of the challenges and opportunities of pension schemes.

Similarly, most studies focus on the accumulation phase of pension schemes, and there is limited research on the decumulative (payout) phase. This limits the ability of researchers to provide insights into the challenges and opportunities of the decumulative phase and develop effective solutions. The objective of the paper is to empirically examine the Decumulative (payout) phase under the Defined Contributory Scheme in Nigeria. Thus, the paper hypothesis as below

$H0_1$: There is no significant impact of decumulation (payout) on the pension funds in Nigeria
$H0_2$: Total retiree (TOR) in Nigeria is not a function of monthly annuity (MOA), lumpsum (LUM), premium (PRM) and payment of death benefit (PDB).

Addressing these research gaps can help researchers and policymakers develop effective strategies to improve the effectiveness and efficiency of pension schemes in Nigeria, particularly in the decumulative (payout) phase under the defined contributory scheme.

2.0 Literature review

Concept of Withdrawal Payout (Decumulation)

The contributions of pension income into each individuals Retirement savings account (RSA) is known as the accumulation phase and as at September 2023 pension accumulated contributions amounted into 17.3 trillion naira Umar (2023). Ostensibly, the scheme has started witnessing withdraws in the form of decumulation at retirement. It is at this point that the scheme payout the money to the pensioner. The law PRA2014 stipulates that programmed withdraws or life annuity. The number of were conducted on the Contributory Pension Scheme and it dwelled on the accumulation phase but very few where on the decumulation payout phase in Nigeria.

Gaston, I. and Manisha, P. (2023). Using the Chilean data studied the retirement scheme and found out that indirect effect on its beneficiaries through insurance market. That in the payout phase mandatory annuitization and removing drawdown limits will open up private market policy reforms in the recommendation. However, some countries that joined the Defined contributory scheme cannot use the recommendation due to differences in institutional framework. Despite those countries do not have robust annuity markets.

Sambo H., S. (2023) conducted a study on annuity market and decisions surrounding the consumer choice on his/her retirement funds. The paper discusses Antiquity of Annuities, Annuity Market, industry analysis of the decumulative (payout) phase under annuity in Nigeria, Theory of Consumer Choice on Annuity Decisions, However the study concluded that it is a virgin area that needs to study more customers choices on the pension pay out option at retiree.

Hyams, S. D., Davies, H. R., Findlater, A. J. Gilbert M. A., Hollister K., Kiely, F., Jablonski T. J., Squirrell, M. and Warren, O. H. (2022) conducted a study on OECD countries and argued that Decumulation Pathway is intended as a default solution, or can be tailored by the consumer. the Pension Fund is invested in a guaranteed annuity, Collective Defined Contribution, or a Pooled Pension Fund which maintains individual DC funds but pools longevity risk between participants. It uses the Pooled Pension Fund, an automated withdrawal strategy which ensures a lifetime income is provided and one that aims to increase in line with inflation, and a moderate risk investment strategy. The standard approach is evaluated using various metrics, indicating that it has as a strong chance of providing a higher income than could be obtained from an annuity or drawdown, with limited downside risk. Moreso, this is a technical area that needs others countries to study the intricacies of the decimation payout phase as it will involve a lot of calculations due to individual choices and Laws.

Sambo, H. S. (2010). Conducted a study on the Payout phase (decumulation) of the defined contributory retirement income in Nigeria. Lump sum, programmed with and annuity are what is allowed for retiree as payment methods in Nigeria. The study recommended that the annuity option was that best for Nigerian retirees as it does not stop payment until the retiree dies, However, this study utilized the Pension Reform Act 2004 while the country has amended to the policy document now known as PRA 2014 as amended.

Antolin (2008) Conducted a study on the payout phase of pension, annutites and market on OECD countries and argued that as fertility rate is decreased the ageing population will increase. This increase in life expectancy and the fertility rate decrease explains the increase in the retirees at the age over those that are active workers. There by affecting the decumulation of the pension plan. However, the study was undertaken amost 1years ago.

Methods of retirement benefit payouts:

1. Lump Sum: A retiree may choose to receive their retirement benefits as a one-time, lump-sum payment. This can provide immediate access to the full amount of their retirement savings.
2. Annuity: Retirement benefits can be paid out as an annuity, which provides regular payments over a specified period, often for the remainder of the retiree's life. An annuity can provide a steady income stream during retirement.
3. Programmed withdrawals: Retirement benefits can also be paid out in regular installments, either for a fixed period or for the retiree's lifetime. This method provides a steady income stream while allowing the remaining funds to continue growing.
4. Partial Lump Sum with Annuity: Some retirement plans allow for a combination of a lump-sum payment and an annuity. This provides retirees with both immediate access to a portion of their savings and ongoing income through the annuity.

The specific method of retirement benefit payout will depend on the rules and options offered by the retirement plan or pension scheme, as well as the preferences of the individual retiree. It is important for individuals to carefully consider their options and consult with financial advisors to make informed decisions about how their retirement benefits will be paid out.

3.0 Methodology

The research design that was used in this study is the correlational research design; this is because the design is appropriate in determining the relationship and the degree to which the ownership structure influence the decision to impair goodwill. The population of the study will consist of all the total retiree fund in the Nigerian pension industry as at 2022. The data used in this study is secondary in nature and is extracted from the audited annual reports of the regulator PenCom. This is due to the nature of the model estimated for the study that will

require the use of quantitative data in the form of pension decimation (payout) of retiree evidence as contained in the published annual reports of the regulator for this period.

Model Specification

The functional form of the model for this study is specified as:

$$TOR = f(MOA, LUM, PRM, PDB) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.1$$

Where

TOR = Total retiree
MOA= Monthly annuity
LUM= Lumpsum
PRM= Premium
PDB=Payment of death benefit

Hence, the statis model in 3.1 posits that total retiree (TOR) in Nigeria is a function of monthly annuity (MOA), lumpsum (LUM), premium (PRM) and payment of death benefit (PDB).

Equation 3.1 can be re-written in econometrics form as thus:

$$TORt = \beta 0 + \beta 1MOA + \beta 2LUMt + \beta 3PRMt + \beta 4PDBt + \varepsilon t \ldots\ldots\ldots\ldots\ldots\ldots 3.2$$

Where:

t=time

β_0 = Intercept

$\beta_1 - \beta_6$ = Coefficient of each exogenous or explanatory variable.

ε_t = Stochastic error term

As pointed out by Engle and Granger (1987), if the variables are co-integrated, then any classical Granger test which does not consider the error correction vector is not appropriate, hence the need for Error Correction Model (ECM). ECM is a category of multiple time series model that directly estimates the speed at which a dependent variable returns to equilibrium after a change in an independent variable. ECM incorporates the long-run equilibrium in the dynamic adjustment (that is the short-run model). The ECM is also closely bound up with the concept of co-integration. Such models can be specified thus;

$$\ln\Delta(TOR)t = \beta 0 + \beta 1 \ln\Delta(MOA)t + \beta 2 \ln\Delta(LUM)t + \beta 3\, \Delta(PRM)t + \beta 4\, \Delta(PDB)t + \Phi ECMt - 1 + \varepsilon t \ldots\ldots\ldots 3.5$$

Where:

Δ = Delta, which means change

ECM = Error Correction Model

ε_t= Error term or white noise

$\boldsymbol{\Phi}$ = the speed of adjustment which shows how variables revert to long-run equilibrium

t-1 = the time lag of variation in the variable

4.0 Analysis and Presentation of Data

The study utilized secondary data for the annual reports of the National Pencon Commission for the period to 2013 to 2021 where the retiree began withdrawing from the pension scheme.

Figure 1: An industry analysis of the decumulative (payout) phase under annuity (2013 to 2021).

Year	TOTAL RETIREE	MONTHLY ANNUITY	LUMPSUM	Premium	Payment of death benefit
2013	18031	367.59	16327.88	36834.67	49292.1
2014	7890	324.39	8023.63	32623.81	23445.9
2015	6483	666.56	13536.44	60144.47	21540.7
2016	34876	11748.4	47090.82	170571	111217.6
2017	13663	778.74	13201.88	71051.45	27684.64
2018	13113	732.52	16482.97	87253.52	28682.14
2019	13153	817.62	24923.21	78438.12	27217.53
2020	269143	83568	127.62	713.08	225.89
2021	27843	9220	29.35	96.38	42.83

Source: PenCom Annual report, 2013 to 2021

From Table 1 above reveals the total retirement has been volatile where 18,031 retirees in 2013 got paid 49,292.10 million then a sharp decrease in 2015 with 6,483 retirees who were also paid21,540.70 million and then 34,876 retirees in 2016 where paid 111,217.64 million. At the last quarter of 2019, the amount decreased to 13,153 and they were paid 27,217.53 million. This evidences the fact that retirement naturally or by death remains uncertain and this makes withdrawals from funds a difficult thing to predict. The premium injected into the insurance industry was 170,570.96 million as of 2016 while in 2019 it reduced to 78,438.12 million. Similarly, monthly annuity was 1,1748.40 million as of 2016 which also reduced to817.62 million due to the decrease in the number of retirees within that period.

Noteworthy, as of March 31, 2019, the National Pension Commission (PenCom) revealed that total pension assets in Nigeria rosed to N9.030 trillion, up from the N7.44 trillion as of January 31, 2019. The fund has been cautiously invested in 24 major asset classes to generate greater returns on investment such that benefits to the contributors are achieved. Furthermore, this fund gets injected into either the insurance industry or remains in the pension industry where the retiree selects life annuity or programmed withdrawals. Under Section 7(1)(C) of the Act, monthly pension payment under the Life Annuity Scheme averaged N1.7 billion as of March 2017, and as of the first quarter of 2019 total premiums amounted to 353,685.64 million and annuity amounted

to 3,517.02 million. Additionally, the total premium rewarded by insurers for the Group Life under section 4(5) of the Act was ₦170.57 billion as of March 2017. Notwithstanding these accomplishments there has been the need to further grow a robust annuity market in Nigeria to cater for the retirement needs of the pensioner. As at 2021, the total retiree fund decreased to 27,843 from 269,143 in 2020. This decline may be attributed to the COVID 19 pandemic that slowed down investment activities globally.

4. Presentation and Discussion of Regression Result

Table 1: Descriptive Statistics

	LUM	MOA	PDB	PRM	TOR
Mean	15527.09	12024.87	32149.93	59747.38	44910.56
Median	13536.44	778.7400	27217.53	60144.47	13663.00
Maximum	47090.82	83568.00	111217.6	170571.0	269143.0
Minimum	29.35000	324.3900	42.83000	96.38000	6483.000
Std. Dev.	14270.19	27174.81	33241.87	52225.12	84585.70
Skewness	1.115967	2.360218	1.557826	0.874871	2.420108
Kurtosis	3.789537	6.781955	4.755282	3.349313	6.966007
Jarque-Bera	2.101836	13.71964	4.795613	1.193856	14.68384
Probability	0.349617	0.001049	0.090917	0.550500	0.000648
Sum	139743.8	108223.8	289349.4	537726.5	404195.0
Sum Sq. Dev.	1.63E+09	5.91E+09	8.84E+09	2.18E+10	5.72E+10
Observations	9	9	9	9	9

Source: Authors computation using Eviews 10.0

From Table 1, the average value of the series is measured by the mean of each variable. Meanwhile, the skewness measures the asymmetry distribution of the series around its mean. A positive skewness implies that the distribution has a long right tail and vice versa. Kurtosis, on the other hand, measures the peakedness or flatness of the distribution of the series. For Kurtosis, a normal distribution is 3, if it however exceeds this value, the distribution is assumed to be peaked, relative to the normal. It is flat if it is less than 3. Consequently, LUM, MOA, PDB, and TOR are not normally distributed while PRM is normally distributed. This result is supported by the skewness and kurtosis statistics for the series. This denotes that skewness and kurtosis statistics for PRM are not substantially different from the threshold (0 and 3 respectively). However, skewness and

kurtosis statistics for the other four series (LUM, MOA, PDB, and TOR) are significantly different from the threshold.

Table 2. Unit root test (Augmented Dickey-fuller test)

Variable	*ADF Statistic*	*Critical Value (5%)*	*Order of Integration*	*Prob (5%)*	*Remarks*
TOR	-4.743298	-3.403313	I (1)	0.0107	Stationary
MOA	-4.623455	-3.403313	I (1)	0.0121	Stationary
LUM	-8.323255	-3.694851	I (2)	0.0011	Stationary
PRM	-7.603441	-3.694851	I (2)	0.0027	Stationary
PDB	-3.866649	-3.403313	I (1)	0.0288	Stationary

Source: Authors computation using Eviews 10.0

The unit root test result showed that all the variables, total retirees (TOR), monthly annuity (MOA), and payment of death benefit (PDB) achieved stationary after taking the first difference given that their respective ADF test-statistics is less than the 5% critical value. While lumpsum (LUM), and premium (PRM) also achieved stationary after taking the second difference given that their respective ADF test statistics are less than the 5% critical value. As such, the null hypothesis of non-stationarity can be rejected. The implication of the stationarities of all the series in different order gives credence to the examination of co-integration tests, to verify for possible long run relationships among the variables. Consequently, the cointegration result is presented below;

Table 3: EG cointegration test

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.090383	0.2511
Test critical values:	1% level	-4.582648	
	5% level	-3.320969	
	10% level	-2.801384	

*MacKinnon (1996) one-sided p-values.

Source: Authors computation using Eviews 10.0

It has been contented among scholars, that one would be correct to interpret the outcomes of a static model-like equation if a linear combination of non-stationary series is discovered to be stationary (cointegrated) without further consideration of the time series properties and short-run dynamics of the model.

Table 4: Error Correction Model Estimates

Dependent Variable:	D(TOR)			
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.143220	0.544157	0.263196	0.8362
DLog(MOA(-1))	-0.102540	0.380223	-0.269685	0.8323
DLog(LUM(-1))	5.275820	2.425037	2.175563	0.2743
DLog(PRM(-1))	-2.367875	3.150969	-0.751475	0.5897
DLog(PDB(-1))	-3.167642	1.550939	-2.042403	0.2899
ECM(-1)	-0.626348	3.059062	-0.204752	0.8714
R-squared	0.938029	Mean dependent var		0.180141
Adjusted R-squared	0.628176	S.D. dependent var		1.721492
S.E. of regression	1.049721	Akaike info criterion		2.703301
Sum squared resid	1.101914	Schwarz criterion		2.656939
Log likelihood	-3.461555	Hannan-Quinn criter.		2.130267
F-statistic	3.027332	Durbin-Watson stat		2.302531
Prob(F-statistic)	0.409640			

Source: Authors computation using Eviews 10.0

The result above showed that the ecm is negative and statistically significant. Hence, the ecm measures the speed of adjustment towards long-run equilibrium. The ecm(-1) = 0.62 percent showed the rate at which variation of TOR at time t, adjusts to the long-run co-integrating relationship. More so, the value of constant (c) = -0.62 is not significant at 5% level of significance. This implies that total retiree (TOR) increases by approximately 0.14% when other explanatory variables in the model are zero. The coefficient of determination R^2 is 0.93, suggesting that about 93 percent of the variation in TOR is explained by the behaviours of the explanatory variables. The remaining 5.2 percent variation can be attributed to other variables that are not captured by the model; hence, they are regarded as the error term denoted by e_t.

The coefficient of one period lagged of D(LUM (-1)), is positive. This showed that a percentage increase in one period lagged of LUM, increases the rate of TOR by approximately 5.3%. The coefficient is statistically not significant though, given the p-value of 0.27% is greater than 5%. However, the coefficient of MOA, PRM, and PDB were found to be negative and statistically not significant for the period under review. The implication of this finding implies that persons who are eligible for retirement will have a difficult time enrolling in retirement since their benefits after retirement may be improperly dispensed or arbitrarily postponed for a lengthy period of time. They will thus try to find methods to game the system in order to maintain their employment.

Table 5: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.798097	Prob. F(5,1)	0.4240
Obs*R-squared	6.533037	Prob. Chi-Square(5)	0.2577
Scaled explained SS	0.069338	Prob. Chi-Square(5)	0.9999

Source: Authors computation using Eviews 10.0

The heteroskedasticity test helps to check for the reliability of data in making statistical inferences. Hence, the test revealed that the p-value is 0.2577 is greater than the 5% level of significance. Therefore, the null hypothesis (H_0) of no heteroscedasticity in the model is upheld. This is indicative that the residual term has the same variance regardless of the value of the explanatory variable.

Table 6: Redundant Variable Test

Redundant Variables: DLOG(MOA(-1)) DLOG(LUM(-1)) DLOG(PRM(-1))

	Value	Df	Probability
F-statistic	3.123439	(3, 1)	0.3889
Likelihood ratio	16.37263	3	0.0010

F-test summary:

	Sum of Sq.	Df	Mean Squares
Test SSR	10.32528	3	3.441761
Restricted SSR	11.42720	4	2.856799
Unrestricted SSR	1.101914	1	1.101914

LR test summary:

	Value
Restricted LogL	-11.64787
Unrestricted LogL	-3.461555

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.750339	0.749886	1.000604	0.3736
DLOG(PDB(-1))	0.734141	0.504323	1.455698	0.2192
ECM(-1)	2.083190	2.479576	0.840140	0.4481

R-squared	0.357344	Mean dependent var	0.180141
Adjusted R-squared	0.036016	S.D. dependent var	1.721492
S.E. of regression	1.690207	Akaike info criterion	4.185106
Sum squared resid	11.42720	Schwarz criterion	4.161925
Log likelihood	-11.64787	Hannan-Quinn criter.	3.898589
F-statistic	1.112086	Durbin-Watson stat	3.111262
Prob(F-statistic)	0.413006		

Source: Authors computation using Eviews 10.0

The null hypothesis for the Redundant Variable Test is that the suspected variables are redundant in the model. If the value of the adjusted R^2 Redundant Variable Test is greater than R^2 results; then, one can conclude that the selected otherwise, are not. Therefore, in the case of this study, DLog(MOA(-1)) DLog(LUM(-1)), and DLog(PRM(-1)) were initially suspected to be redundant series that appeared not to be redundant series in the model and this is because the Adjusted R^2, which is 0.04% after listing DLOG(MOA(-1)) DLOG(LUM(-1)) and DLOG(PRM(-1)) as suspected redundant variables, is lesser than the 0.62% which is the value of the Adjusted R^2 from the over-parameterized results.

Table 7: Normality Test

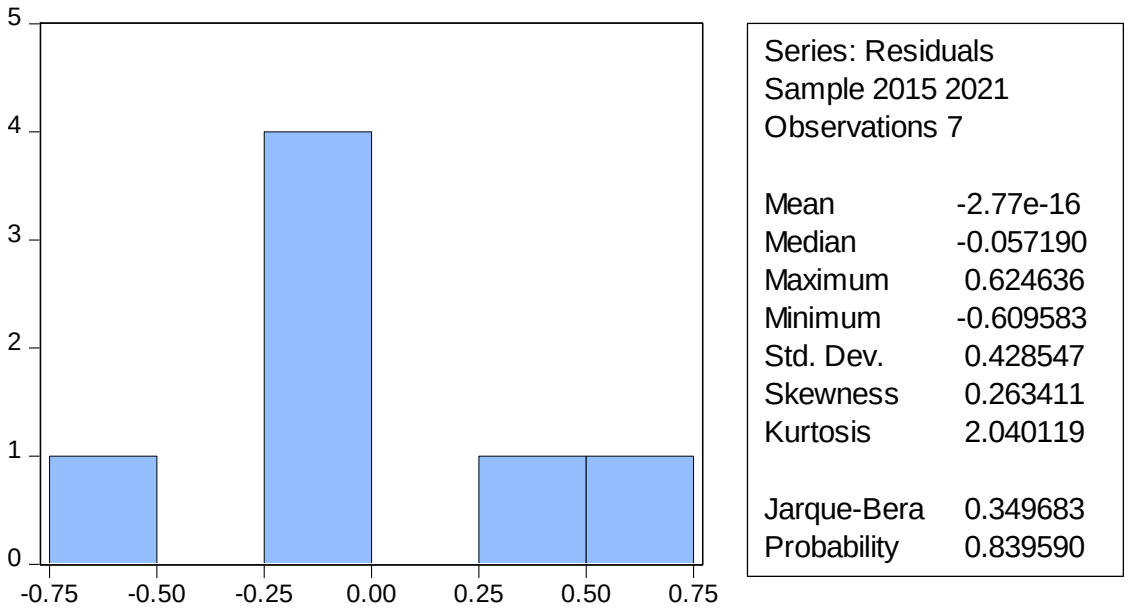

fig 1: Ramsey Test
Source: Authors computation using Eviews 10.0

The normality test result showed that the regression residual is normally distributed given that the p-value of the Jarque-Bera statistic is greater than 0.5% level of significance.

Conclusion

The study analyzed the effect of monthly annuity (MOA), payment of death benefit (PDB), lumpsum (LUM), and premium (PRM) on total retirees (TOR) for a period of 2013 to 2021 in Nigeria. Being a time series data, the unit root test result carried out on the data showed that all the variables, total retirees (TOR), monthly annuity (MOA), and payment of death benefit (PDB) achieved stationary after taking the first difference given that their respective ADF test-statistics is less than the 5% critical value. While lumpsum (LUM), and premium (PRM). The implication of the stationarities of all the series in different order gives credence to the examination of co-integration tests, to verify for possible long run relationships among the variables. The cointegration test revealed no presence of long-run relationship among the variable. Given this, the ECM analysis was carried out, the result showed that (MOA, PRM, and PDB) jointly exert negative influence on the dependent variable for the period under investigation. Though the outcomes are statistically not significant. Furthermore, the coefficient of LUM exert a positive and insignificant influence on the dependent variable. In line with this finding, the study concluded that the total variation that occurred in the dependent variable are jointly explained by the independent variable.

Recommendations

Based on the outcome of the analysis, the study recommended timely payment of the monthly annuity (MOA), payment of death benefit (PDB), lumpsum (LUM), and premium (PRM) to the retirees. This would facilitate the elimination of the negative and positive insignificant effect the regressors has on the regressand. Secondly, data base of the retirees should be improved upon and get synchronized with automated payment system, to guarantee prompt a payment as at when due. Delay in payments could have irreparable damages on the retiree for which reason the study showed negative and insignificant relationship between the dependent and independent variables. There is a need for more stakeholder engagement, including pension fund administrators, regulators, and pensioners, to provide a comprehensive understanding of the challenges and opportunities of the decumulative phase under the defined contributory scheme in Nigeria.

Somes areas for further study can be undertaken to explore longevity risk and payouts, behavioral economics and payout choice and the impact of retirees' payout decisions on their overall financial security, including the ability to cover living expenses, manage healthcare costs, and maintain a comfortable standard of living in retirement and policy implications and regulatory framework that can meet with global standards.

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