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# TESTING THE MODIGLIANI LIFE CYCLE HYPOTHESIS: The Influence of Demographic Shifts on Nigeria's Savings Rate

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## Abstract

Nigeria's national savings rate has fallen steadily over the past four decades, even though the country now has a larger working-age population. This raises the question of whether the Life-Cycle Hypothesis (LCH) still explains saving behavior in Nigeria. This study examined the relevance of the LCH using annual data from 1981 to 2022 and applied both the standard ARDL model and the Quantile ARDL approach. In the short run, the findings revealed that the dependent population reduces savings, while the working-age population increases them, conforming to the predictions of the LCH. However, in the long run, youth dependency increases savings, but these effects disappear once key socioeconomic and macroeconomic factors such as income, employment, inflation, interest rates, and education are taken into account. When these factors are included, youth dependency becomes negative in both the standard and Quantile models. This means that weak economic conditions limit the ability of young dependents to become productive adults who can later contribute to savings. Based on the results, the study recommends strengthening pension and social security systems, improving employment opportunities for the working-age population, and investing in child development to address the demographic pressures that directly affect savings in Nigeria.


*Keywords:* Age Structure, Old Dependency Ratio, Quantile ARDL, Socioeconomic Factors, Young Dependency Ratio.
*JEL Classification:* J1, D91.

## I. Introduction

National growth depends heavily on savings. The Harrod-Domar model emphasised the role of savings in driving economic growth (Harrod, 1939; Domar, 1946). Savings provide essential funds for investments. These investments in turn stimulate production and employment, thereby promoting sustainable economic growth (Ribaj & Mexhuani, 2021). Inadequate savings compel nations to depend on external capital sources, leading to increased national debt and greater exposure to external economic vulnerabilities (Ersin & Eti, 2017). Solow (1956) stresses the importance of a high savings rate for boosting per capita income. Solow's growth model suggests that sav-

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ings lead to capital accumulation, which is vital for economic expansion. Building on this, Lucas (1988) and Romer (1986) argue that savings are key for economic growth by supporting technological innovation and human capital development, which are crucial for sustained economic progress. While these classical and endogenous growth theories highlight the role of savings, demographic factors can also influence savings behaviour, as explained by the Life Cycle Hypothesis (LCH). This is particularly relevant for Nigeria, where demographic shifts have been significant.

Demographic changes, particularly the age distribution of a country's population, have a substantial impact on its savings. An Italian economist, Franco Modigliani, developed the Life Cycle Hypothesis (LCH), which suggests that people maintain a steady living standard by planning their savings and consumption over the course of their lives (Modigliani & Brumberg, 1954). A higher percentage of working-age people tends to raise the overall savings rate, whereas a larger proportion of elderly individuals tends to lower it (Frini, 2022).

In recent decades, Nigeria has faced a challenging demographic profile. From 1981 to 2022, Nigeria's average young dependency ratio (0-14 years) of approximately 44.2 per cent is substantially higher than in advanced economies such as Switzerland (19 per cent) and Singapore (25 per cent), where lower fertility rates and stronger social safety nets reduce the burden on working-age adults (World Bank, 2023). This demographic trend indicates inadequate measures to control fertility rates, resulting in a higher child population (Olabiyi, 2018; Adebowale, 2019). Conversely, Nigeria's working-age population share of 53 per cent lags behind both emerging economies, such as the UAE (74 per cent), and developed nations, such as France (64 per cent), indicating a narrower productive base to support dependents and generate national savings (World Bank, 2023).

Nevertheless, Nigeria lags behind African countries such as Mauritius (63.7 per cent) and South Africa (59.42 per cent) in terms of working-age population (World Bank, 2023). This moderate share of the working-age population does not significantly raise the savings rate due to low incomes. Furthermore, the proportion of elderly individuals in Nigeria is lower (2.82 per cent), likely due to a weak healthcare system, which reduces life expectancy (World Bank, 2023). This is concerning, given how crucial effective healthcare is to achieving the United Nations Sustainable Development Goal 3, which aims to guarantee healthy lives for people of all ages.

Over the last four decades, Nigeria’s demographic profile has experienced gradual changes. The young dependency ratio declined steadily from 1981 to 2022, while the old dependency ratio also fell, reducing the total dependency burden. At the same time, the working-age population increased slightly, indicating a modest expansion of the labour force. Fertility rates and population growth rates also declined during this period, reflecting a slowdown in demographic expansion, as summarised in Table 1. With a favourable shift in the population's age structure, one would expect the savings rate to increase during the period under review, as predicted by the LCH. However, the op-

posite trend was observed. The overall national savings rate reduced significantly, falling from 88.4 to 30.4 per cent, as shown in Figure 1. This decline is not an artefact of changes in how savings were measured. Rather, it reflects Nigeria's economic history. The steepest drop occurred between 1981 and 1985 when global oil prices collapsed, triggering a debt crisis that forced the country into the Structural Adjustment Program (SAP) in 1986 (International Monetary Fund, 1997). SAP policies, such as currency devaluation and subsidy removal, further compressed household purchasing power and reduced the capacity to save. This contrasts with LCH, which predicts that higher savings rates should follow a demographic shift that favours a larger working-age population and a smaller dependent population. This discrepancy also challenges previous findings (Akeju, 2016; Olanipekun & Akeju, 2017; Adewale & Abeeb, 2025) that support the LCH, thereby motivating this study.

The political and institutional landscape of Nigeria's pension system complicates predictions from the Life Cycle Hypothesis (LCH). The Pension Reform Act of 2004 created a contributory defined contribution scheme, but coverage remains low, with less than 10 per cent of the working-age population participating, and workers in the informal sector are largely excluded (National Pension Commission, 2022). Previous reforms have been hindered by inadequate administration, corruption, and ineffective

**TABLE 1**

Demographic profile of Nigeria from 1981 to 2022

| Year | Young Dependency Ratio (% of Working Population) | Old Dependency Ratio (% of Working Population) | Total Dependency Ratio (% of Working Population) | Working Population (% of Total Population) | Population Growth Rate (Annual %) | Fertility Rate (Births Per Woman) |
|---|---|---|---|---|---|---|
| 1981 | 84.0 | 6.1 | 90.1 | 52.6 | 3.0 | 6.8 |
| 1985 | 86.5 | 6.2 | 92.7 | 51.9 | 2.7 | 6.6 |
| 1990 | 86.0 | 6.1 | 92.1 | 52.0 | 2.6 | 6.5 |
| 1995 | 83.1 | 6.0 | 89.1 | 52.9 | 2.6 | 6.3 |
| 2000 | 81.1 | 5.8 | 86.9 | 53.5 | 2.6 | 6.1 |
| 2005 | 82.3 | 5.8 | 88.1 | 53.2 | 2.7 | 6.1 |
| 2010 | 84.1 | 5.8 | 89.9 | 52.6 | 2.7 | 6.0 |
| 2015 | 84.2 | 5.7 | 89.9 | 52.7 | 2.5 | 5.6 |
| 2020 | 81.3 | 5.6 | 86.9 | 53.5 | 2.4 | 5.3 |
| 2022 | 79.7 | 5.5 | 85.3 | 54.0 | 2.4 | 5.1 |

*Source:* Author's estimation from World Bank Data (2023).


*Source:* Author's Compilation from World Bank Data (2023).

**FIGURE 1**

Trend of Nigerian Savings (% of GDP) from 1981 to 2022

enforcement, which have diminished public confidence in formal retirement savings. As a result, the majority of older Nigerians depend on support from family members rather than their own savings. This situation indicates that a rise in youth dependency might ironically lead to increased savings among working-age individuals who expect to assist their ageing parents. This trend aligns more with the Overlapping Generations model than with the traditional LCH (Diamond, 1965).

This research explored the relationship between demographic changes and savings rates in Nigeria. While several studies have examined the relationship between demographic changes and economic growth in Nigeria (Obafemi et al., 2014; Ogunjimi and Oladipupo, 2018; Hassan et al., 2019; Olabiyi, 2018), few have specifically examined how shifts in demographic factors affect savings rates in Nigeria. Akeju (2016) is one of the rare exceptions; moreover, most studies in this area are based on foreign contexts (Yuanyuan et al., 2019; Yorulmaz, 2010; Yin & Horioka, 2022), which may not accurately reflect the Nigerian situation. Additionally, this study evaluated the validity of the Modigliani Life-Cycle Hypothesis (LCH) in explaining the relationship between savings rates and demographic shifts in contemporary Nigeria. Many existing studies have not explicitly tested this hypothesis, and those that have are often outdated, limiting their relevance to today's economic realities.

In addition to employing the ARDL technique, this study used the Quantile ARDL approach to examine the impact of demographic changes across different quantiles of the savings rate, unlike previous studies that focused mainly on the average effect of demographic changes on savings. This approach allowed us to explore how demographic factors affect households with low, medium, and high savings levels differently

(for example, the 0.25 quantile represents low savings, the 0.5 quantile represents median savings, and the 0.75 quantile represents high savings).

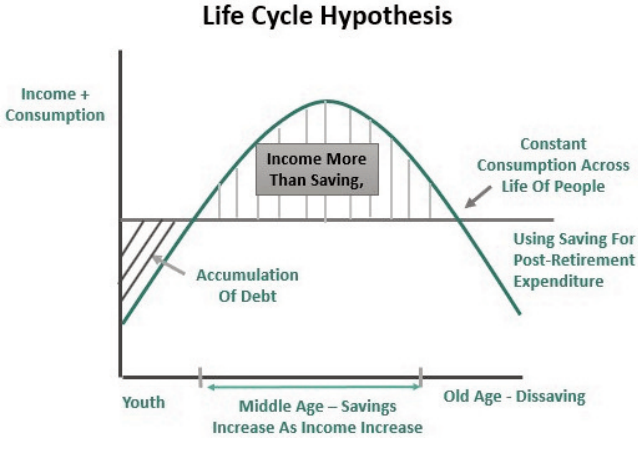
A further gap in the literature is the limited incorporation of key socioeconomic and macroeconomic factors, such as income, employment, education, inflation, and interest rates, in analyses of the demographic-savings relationship in Nigeria. Most prior studies have not included these important variables as robustness checks to account for the ways in which broader economic conditions shape saving behaviour. By integrating these socioeconomic indicators into both the ARDL and Quantile ARDL models, this study provides a more comprehensive and realistic understanding of how demographic changes interact with economic factors to influence savings rates across population segments.

## II. Literature Review

### *1. Theoretical Review*

There is a plethora of theories that explain household saving behaviour. The Life-Cycle Hypothesis (LCH) is the foremost of these theories. The LCH was introduced in 1954 by an Italian-American economist and Nobel laureate, Franco Modigliani. The LCH, further refined by Ando and Modigliani in 1963, remains the most influential model for explaining savings behaviour. It explains the relationship between an individual's age and their savings patterns (Yorulmaz, 2010).

The LCH explains that individuals aim to maintain a relatively stable level of consumption across their lifetime, despite variations in income. As illustrated in Figure 2,




*Source:* Author's Compilation, 2026.

**FIGURE 2**

Franco Modigliani Life Cycle Hypothesis

in early life, individuals typically have little or no income and therefore borrow or rely on external support, leading to debt accumulation. In middle age, income rises substantially, surpassing consumption needs and allowing individuals to save. This stage is the peak of wealth accumulation, as savings are set aside to support future consumption. In old age, income declines due to retirement, and individuals begin to dissave, drawing on their accumulated savings to finance their expenditure. Thus, the model emphasises how demographic composition, particularly the balance between youth, working-age adults, and the elderly, directly shapes overall savings rates in the economy.

In Nigeria, this prediction faces complications. The country's demographic structure is dominated by a large youth population, with over 40 per cent under 15, while the elderly population remains relatively small (World Bank, 2023). This high dependency ratio means that a significant share of household income is spent on supporting dependents, leaving little for savings. Moreover, because life expectancy is low and pension coverage is limited, old-age dissaving as predicted by the LCH is less evident (Kashgain, 2024). Instead, elderly Nigerians often rely on intergenerational support, weakening the LCH's assumptions of retirement-driven dissaving. Ojogbo et al. (2025) recently challenged the applicability of the LCH in Nigeria, arguing that high unemployment, pervasive informal economic activity, and weak social security systems render the model's predictions unreliable for large segments of the population.

While the LCH emphasises lifecycle factors, Friedman's Permanent Income Hypothesis (PIH) (1957) shifts the focus to expected income. According to the theory, an individual's consumption and saving decisions are a function of their expected or permanent income rather than their current income. Temporary income, such as windfall gains, has a limited impact on household savings, while permanent income is more likely to shape behaviour. In Nigeria, however, permanent income expectations are undermined by frequent economic instability - oil price shocks, inflation, and currency devaluation make it difficult for households to predict long-term income. Consequently, savings decisions may be influenced more by uncertainty than by lifecycle planning.

Beyond income expectations, the precautionary saving model, also known as the buffer-stock model, argues that uncertainty and liquidity constraints play a key role in shaping saving behaviour (Deaton, 1991; Carroll, 1997). This is highly relevant in Nigeria, where informal sector employment accounts for over 76.6 per cent of the labour force, and access to formal credit is severely constrained (Okamba, 2024). Many households therefore save as a buffer against unforeseen shocks such as illness, unemployment, or price increases. However, such precautionary savings are often kept in informal systems (ajo or esusu) rather than in financial institutions, limiting wealth accumulation. This reality contradicts the LCH's prediction that savings naturally rise with income and working age.

Apart from income and uncertainty, Duesenberry's (1949) Relative Income Hypothesis argues that social and psychological factors shape household savings behaviour. In Nigeria, cultural and social obligations such as weddings, funerals, and

extended family responsibilities often encourage higher consumption relative to income. The emulation effect can be observed in urban centres, where rising middle-class households mimic the consumption patterns of wealthier groups. Similarly, the ratchet effect means households are reluctant to reduce consumption standards even when their income falls, thereby reducing their ability to save. The ongoing significance of Duesenberry's (1949) Relative Income Hypothesis in present-day Nigeria is reinforced by recent empirical studies. Iborida et al. (2025) examined consumer buying behaviour in Abuja, Nigeria, revealing that both income levels and peer group influence play a crucial role in shaping purchasing choices, with peer group dynamics steering consumption habits within social networks regardless of current income status. This observation directly supports Duesenberry's idea of the 'keeping up with the Joneses' phenomenon and confirms that the theory continues to be relevant when interpreted through the lens of contemporary Nigerian data.

Another alternative saving theory is the Behavioural Life-Cycle Hypothesis (BLC) developed by Shefrin and Thaler (1988). This theory extends the LCH by incorporating psychological realities into the model. In Nigeria, behavioural challenges such as low financial literacy, a preference for immediate gratification, and weak institutional mechanisms for long-term saving (e.g., retirement accounts or insurance penetration) make the behavioural life cycle particularly relevant. Many households consume more in the present and under-save for the future, diverging from the rational LCH predictions.

The final theory to be considered is the Overlapping-Generations (OLG) Model (Diamond, 1965). This model extends the LCH by explicitly modelling interactions among cohorts and the roles of both public and private transfers. In Nigeria, intergenerational transfers are widespread due to limited pension coverage and weak public welfare systems (Kashgain, 2024). Rather than relying on accumulated savings, many elderly Nigerians depend on remittances from children and relatives. As such, the LCH prediction of old-age dissaving through reliance on prior savings is replaced by family-based support, making the Nigerian case distinct.

Taken together, these theories suggest that while demographic factors are important, Nigeria's savings behaviour is also shaped by economic instability, the dominance of the informal sector, cultural obligations, and weak institutional support. This raises the question of whether the LCH, though highly influential, adequately explains savings behaviour in Nigeria, given the country's unique demographic and economic realities.

## *2. Empirical Review*

The relationship between demographic changes and savings rates has generated considerable debate among scholars. While some empirical studies affirm the predictions of the Life-Cycle Hypothesis (LCH), others present contrasting findings.

A body of research supports the LCH, highlighting a significant negative relationship between the dependent population and the savings rate. For instance, a recent study by

Adewale and Abeeb (2025) employed Vector Autoregression (VAR) and found that Nigeria's large youthful population leads to lower household savings. Choudhury and El Harbi (2018) examined panel data for North African countries (1980–2015). Using the Vector Error Correction Model (VECM) and Autoregressive Distributed Lag (ARDL) approaches. Their results indicate that a dependent population adversely affects household savings rates, affirming the LCH's core proposition that higher dependency reduces the capacity to save. Consistent with this, Akeju (2016), employing ARDL with Nigerian data from 1980 to 2013, found that high dependency ratios reduce savings, suggesting a need for fertility control. Building on evidence from Nigeria, Obafemi et al. (2014) analysed Nigerian data (1970–2011) using an error-correction model. They reported that a population dominated by children and the elderly strains economic performance, with child dependency exerting a stronger negative effect than old-age dependency.

Extending the argument, Olabiyi (2018) found that Nigeria's working-age population contributes positively to economic growth, using a VECM framework. Across different national contexts, the evidence remains mixed. For example, Yin and Horioka (2022) used Spatial Durbin modelling on Chinese provincial data (2002–2019) and found strong spatial correlations in household savings. Their results confirm the LCH: both young and old-age dependency reduce savings. Yorulmaz (2010), in Turkey, employed an error-correction model using data spanning 1968 to 2007 and found that youth dependency negatively affects savings, while the effect of old-age dependency, although positive, is negligible. In contrast, Hsu and Lo (2019) conducted a simulation study in Japan that integrated the LCH into a Neoclassical growth framework. Their results suggest that an ageing population diminishes savings from current income, while the working-age population plays a more prominent role in driving economic growth through savings.

Yet the picture is not uniform; several studies challenge the LCH's prediction that both young and old populations primarily reduce savings. For instance, Hassan et al. (2019) conducted a panel GMM analysis across 53 African countries (1980–2019), finding that youth dependency suppresses savings, while working-age and elderly populations contribute positively, contradicting the LCH assumption that the elderly primarily dissave. Such findings may be better explained by the Overlapping Generations (OLG) framework, which accounts for intergenerational transfers and extended labour market participation. In many African countries, elderly individuals continue to engage in economic activities or rely on familial support networks, thereby contributing positively to household savings rather than reducing them.

Building on this African evidence, Ojogbo et al. (2025) directly reassessed the LCH in Nigeria and found that the model's assumptions are undermined by high unemployment, pervasive informal economic activity, and weak social security systems. They argue that these structural factors render the LCH's predictions unreliable for large segments of the Nigerian population, supporting the view that context-specific modifications are necessary.

The role of informal savings mechanisms in shaping household behaviour is further highlighted by Kouandou and Pérolde Zeh (2024), who use a difference-in-differences fixed-effects specification on a Nigerian household-level panel spanning four waves over eight years. Their findings revealed that participation in informal savings associations such as esusu and ajo helps households hedge consumption against rainfall shocks, though effects vary between urban and rural areas.

Recent research in Nigeria has gone beyond age distribution and dependency ratios to explore how financial inclusion and informal savings practices influence household saving behaviour. Onugu et al. (2024) conducted a study on rotating savings and credit associations (ROSCAs) in Ogun State and found that factors such as the dependency ratio, age, and household size significantly affect default risk, underscoring the financial challenges faced by households with more dependents. Similarly, Danlami et al. (2024) examined the impact of non-interest financial inclusion in North-West Nigeria and found that longer business experience significantly enhances household savings patterns, which, in turn, improve their livelihoods. These studies indicate that to understand saving behaviours in Nigeria fully, it is essential to consider both informal financial systems and the demographic traits of savers.

Similarly, using fixed-effect regressions, Olanipekun and Akeju (2017) analyzed six ECOWAS countries from 1981 to 2014. They found that both youth and working-age populations reduce savings, contradicting the LCH expectation that a larger working-age group enhances savings. These unexpected results invite alternative explanations. For example, Friedman's Permanent Income Hypothesis (PIH) provides a useful lens: in economies with volatile incomes and weak social safety nets, individuals may base consumption on anticipated future earnings rather than current capacity to save. If income expectations are unstable, as in resource-dependent economies such as Nigeria, working-age individuals may consume more than they save, even in their prime earning years.

Complementing these findings, Orji et al. (2024) examined household savings in Nigeria using a large-scale survey of over 31,000 households. Their probit regression analysis revealed that financial literacy positively promotes formal savings, while larger household sizes face greater challenges that hinder saving tendencies. This highlights the importance of financial education as a complementary policy to demographic interventions.

Adding further insights, Ogunjimi and Oladipupo (2018) applied an ARDL model to Nigerian data (1981–2016) and found that ageing reduces growth, whereas youth and working-age groups contribute positively. The unexpected positive role of youth reflects precautionary saving behaviour, where households save in anticipation of future risks. This suggests that younger cohorts may save more in anticipation of future needs, behaviour consistent with precautionary savings theory. The psychological dimensions of saving behaviour in Nigeria have been explored by Ugwu et al. (2024). Focusing on university pre-retirees, they found that parental influence significantly

predicts retirement anxiety, while saving behaviour serves as a mediator in this relationship. This suggests that intergenerational expectations and psychological factors shape retirement preparedness in ways that the classical LCH does not capture.

A recent study by Yuanyuan and Kassim (2023) employed the Vector Autoregressive (VAR) model on data from 1990 to 2022 and found that youth dependency increases savings, while the elderly exert minimal influence, contradicting LCH expectations. This may relate to the country's evolving demographic policies, particularly the 2015 abolition of the one-child policy, reflecting an institutional shift favouring larger families.

Overall, the evidence suggests that while the Life-Cycle Hypothesis (LCH) remains influential, its predictions are highly context-dependent, influenced by factors such as income volatility, intergenerational transfers, and behavioural motives. These alternative perspectives help explain why findings vary across countries and over time. Despite this, a methodological gap remains in the literature on Nigeria. Most studies have relied on mean-effect models like ARDL and VECM, paying limited attention to heterogeneity in effects or to behavioural and institutional dimensions. Additionally, very few Nigerian studies have incorporated key socioeconomic factors such as income, employment, education, inflation, and interest rate as robustness checks in their models. To address these gaps, the present study re-examines the demographic–savings relationship in Nigeria by applying both ARDL and Quantile ARDL approaches. This not only allows for the capture of heterogeneous effects across different parts of the savings distribution but also tests how socioeconomic variables shape demographic impacts, providing a more complete and detailed understanding of savings behaviour in Nigeria.

## III. Methodology

### *1. Model Specification*

Following Modigliani's Life-Cycle Hypothesis, which posits that an individual's saving behaviour varies systematically with age (Ando & Modigliani, 1963), this study adopts the LCH as its theoretical framework. The hypothesis suggests that the age composition of the population, especially the ratios of the young, working, and ageing populations, can considerably affect aggregate savings in an economy. For the robustness check, key socioeconomic variables, including GDP per capita (GDPPC), education enrollment (EDU), employment rate (EMP), inflation (INF) and Interest Rate (INTR), were incorporated into the model, with data sourced from the World Bank (2023).

Based on this, and building on the methodology used by Akeju (2016), who analysed the impacts of age structures on economic growth in Nigeria, our empirical model will take the functional form in Equation (1).

$$SAV = f\ (YDR, ODR, WP, FER, PGR) \quad (1)$$

The mathematical form of the model is stated in Equation (2)

$$SAV = \beta_0 + \beta_1\ YDR + \beta_2\ ODR + \beta_3\ WP + \beta_4\ FER + \beta_5\ PGR \quad (2)$$

The model in econometric form is stated in Equation (3)

$$SAV = \beta_0 + \beta_1\ YDR + \beta_2\ ODR + \beta_3\ WP + \beta_4\ FER + \beta_5\ PGR + \mu \quad (3)$$

Where:

SAV = Savings Rate
YDR = Young Dependency Ratio
ODR = Old Dependency Ratio
WP = Working Population
FER = Fertility Rate
PGR = Population Growth Rate
$B_0$ is the intercept term.
$\beta_1$ to $\beta_5$ are the coefficients of the explanatory variables,
$\mu$ is the error term.

### *2. Variable Description and A priori Expectation*

The variables employed in the model and the theoretical expectations for each coefficient are presented in Table 2.

### *3. Estimation Method*

a) Standard ARDL model

This study employed the ARDL model, introduced by Pesaran et al. (2001). The ARDL technique is a widely used econometric method for assessing a long-term relationship among variables. It is most suitable when we have a mixture of I (0) and I (1) levels of stationarity among the variables. Before estimation, stationarity tests (Augmented Dickey Fuller, Dickey Fuller-Generalised Least Squares, and structural break tests) confirmed a mixed order of integration I (0) and I (1), with no variable integrated of order two I (2), justifying the use of the ARDL bounds testing approach. Optimal lag length was selected using the Akaike Information Criterion (AIC).

Equation (4) is the ARDL model showing both the long-run and short-run relationships among the variables.

$$\begin{aligned}\Delta SAV_t = {} & \omega + \gamma T + \beta_1 SAV_{t-1} + \beta_2 YDR_{t-1} + \beta_3 ODR_{t-1} + \beta_4 WP_{t-1} + \beta_5 PGR_{t-1} \\ & + \beta_6 FR_{t-1} + \sum_{i=1}^{m} \rho_i \, \Delta SAV_{t-1} + \sum_{i=0}^{n} \alpha_{1i} \, \Delta YDR_{t-1} + \sum_{i=0}^{p} \alpha_{2i} \, \Delta ODR_{t-1} \\ & + \sum_{i=0}^{q} \alpha_{3i} \, \Delta WP_{t-1} + \sum_{i=0}^{r} \alpha_{4i} \, \Delta PGR_{t-1} + \sum_{i=0}^{s} \alpha_{5i} \, \Delta FR_{t-1} + \varepsilon_t \end{aligned} \quad (4)$$

**TABLE 2**

Variable Description and A Priori Expectation

| Variable | Description | Source | Expected Sign |
|---|---|---|---|
| SAV | Total gross savings | WDI, 2023 | - |
| YDR | Population of children aged 0-14. | WDI, 2023 | Negative |
| ODR | Population of elderly people aged 65 and above. | WDI, 2023 | Negative |
| TDR | Dependent population, both children and elderly people | WDI, 2023 | Negative |
| WP | Economically active population of the country (15-64 years) | WDI, 2023 | Positive |
| FR | The typical number of children that a woman will have during her lifetime | WDI, 2023 | Negative |
| PGR | The rate at which the population of a region increases over a specified period | WDI, 2023 | Negative |
| GDPPC | GDP per capita (constant US$) is a proxy for income levels. | WDI, 2023 | Positive |
| EDU | School Enrollment, Secondary (% gross), a proxy for education. | WDI, 2023 | Positive |
| EMP | Employment to population ratio, 15+, total (%) (modelled ILO estimate). | WDI, 2023 | Positive |
| INF | Inflation, consumer prices (annual %). | WDI, 2023 | Negative |
| INTR | Interest rate on deposits with banks (%) | CBN, 2023 | Positive |

*Source:* Author's estimation from World Bank's WDI and Central Bank of Nigeria (CBN) Statistical Bulletin.

Where Δ is the difference operator indicating short-run, $\omega$ is the constant term, $\gamma$ represents the trend, $\rho$ is the coefficient of the lag values of the dependent variable, $\alpha$ represents the short-run coefficient of the explanatory variables, $\beta$ represents the long-run coefficients of the explanatory variables, and $\varepsilon$ represents the error term.

Equation (5) is the short-run error correction model (ECM)

$$\Delta SAV_t = \omega + \gamma T + \sum_{i=1}^{m} \rho_i \Delta SAV_{t-1} + \sum_{i=0}^{n} \alpha_{1i} \Delta YDR_{t-1} + \sum_{i=0}^{p} \alpha_{2i} \Delta ODR_{t-1} + \sum_{i=0}^{q} \alpha_{3i} \Delta WP_{t-1} + \sum_{i=0}^{r} \alpha_{4i} \Delta PGR_{t-1} + \sum_{i=0}^{s} \alpha_{5i} \Delta FR_{t-1} + \partial ECT_{t-1} + \varepsilon_t \quad (5)$$

Where all parameters are as previously defined in Equation (4), in addition, ECT is the error correction term. The error correction term's coefficient δ indicates how quickly short-term disequilibrium is adjusted to long-term equilibrium.

Equation (6) is the long-run form.

$$\Delta SAV_t = \omega + \beta_1 YDR_t + \beta_2 ODR_t + \beta_3 WP_t + \beta_4 PGR_t + \beta_5 FR_t + \varepsilon_t \quad (6)$$

b) Quantile ARDL Model

This study was extended using the Quantile ARDL (QARDL) model proposed by Cho et al. (2015), which measures the impact of the independent variables across the different quantiles of the savings rate, unlike previous studies that focused mainly on the average effect of demographic changes on the savings rate. This approach allowed us to explore how demographic factors affect households with low, medium, and high savings levels differently (for example, the 0.25 quantile represents low savings, the 0.5 quantile represents median savings, and the 0.75 quantile represents high savings). The Quantile ARDL specification is presented in Equation (7), while the Error Correction Form is presented in Equation (8).

$$\begin{aligned} Q_{\Delta SAVt}(\tau) = {} & \alpha(\tau) + \rho SAV_{t-1} + \beta_{YDR} YDR_{t-1} + \beta_{ODR} ODR_{t-1} + \beta_{WP} WP_{t-1} \\ & + \beta_{PGR} PGR_{t-1} + \beta_{FR} FR_{t-1} + \sum_{i=1}^{m} b_i(\tau) \Delta SAV_{t-1} + \sum_{i=0}^{n} c_i(\tau) \Delta YDR_{t-1} \\ & + \sum_{i=0}^{p} d_i(\tau) \Delta ODR_{t-1} + \sum_{i=0}^{q} f_i(\tau) \Delta WP_{t-1} + \sum_{i=0}^{r} g_i(\tau) \Delta PGR_{t-1} \\ & + \sum_{i=0}^{s} h_i(\tau) \Delta FR_{t-1} + \varepsilon_t(\tau) \end{aligned} \quad (7)$$

The QARDL-ECM form of the model above can be stated as follows in Equation (8):

$$Q_{\Delta SAVt}(\tau) = \alpha(\tau)+\rho(\tau)[SAV_{t-1}-\beta_{YDR}(\tau)YDR_{t-1}+\beta_{ODR}(\tau)ODR_{t-1}+\beta_{WP}(\tau)WP_{t-1} +\beta_{PGR}(\tau)PGR_{t-1}+\beta_{FR}(\tau)FR_{t-1}]+\sum_{i=1}^{m} b_i(\tau)\Delta SAV_{t-1}+\sum_{i=0}^{n} c_i(\tau)\Delta YDR_{t-1} + \sum_{i=0}^{p} d_i(\tau)\Delta ODR_{t-1}+\sum_{i=0}^{q} f_i(\tau)\Delta WP_{t-1}+\sum_{i=0}^{r} g_i(\tau)\Delta PGR_{t-1}+\sum_{i=0}^{s} h_i(\tau)\Delta FR_{t-1}+\varepsilon_t(\tau) \quad (8)$$

The total short-run effect of the preceding savings on the contemporary savings rate is calculated using the delta method, i.e. b*. The cumulative short-run impact of the past and present values of YDR, ODR, WP, PGR and FR is calculated by c*, d*, *, g*, h*, respectively.

The long-run parameters for YDR, ODR, WP, PGR and FR are calculated as $\beta_{YDR*}$ = -, $\beta_{ODR*}$ = -, $\beta_{WP*}$ = -, $\beta_{PGR*}$ = -, $\beta_{FR*}$ = -, respectively. The ECM parameter is expected to be negative and significant.

## IV. Presentation and Analysis of Results

### *1. Preliminary Statistics*

The descriptive statistics and correlation matrix of the variables used in the analysis are presented in Tables 3 and 4, respectively.

Nigeria's SAV averaged 40.99 per cent between 1981 and 2022, with the best and lowest values being 88.39 per cent and 13.08 per cent, respectively, according to Table 3. Additionally, the mean YDR during the study period was 83.58 per cent, with the highest and lowest values being 86.88 and 79.74 per cent, respectively. The mean ODR is 5.9 per cent, with the highest and lowest values at 6.19 per cent and 5.51 per cent, respectively. The average TDR was 89.48 per cent, indicating

**TABLE 3**

Summary of Descriptive Statistics

| Var. | Unit of Measurement | Mean | Max. | Min. | Std. |
|---|---|---|---|---|---|
| SAV | % of GDP | 40.99 | 88.39 | 13.08 | 19.16 |
| YDR | % of Working Population | 83.58 | 86.88 | 79.74 | 1.89 |
| ODR | % of Working Population | 5.90 | 6.19 | 5.51 | 0.19 |
| TDR | % of Working Population | 89.48 | 93.07 | 85.25 | 2.05 |
| WP | % of Total Population | 52.98 | 53.98 | 51.88 | 0.59 |
| FR | Births per 1,000 women of childbearing age | 6.09 | 6.82 | 5.14 | 0.44 |
| PGR | Annual % | 2.61 | 3.00 | 2.38 | 0.13 |

*Source:* Author's estimation.

that her resources are under pressure due to Nigeria's high reliance ratio. The highest and lowest WP values were 53.98 per cent and 51.88 per cent, respectively, with an average of 52.98 per cent. The highest and lowest values for FR were 6.82 and 5.14, respectively, with an average of 6.09 per 1000 women. The PGR's best and lowest values were 3 per cent and 2.38 per cent, respectively, with an average of 2.61 per cent. The demographic factors' standard deviations of 1.89, 0.19, 2.05, 0.59, 0.44 and 0.13 show that there hasn't been a substantial variation in the observations' mean value over the course of the study period.

Table 4 shows that the savings rate is negatively correlated with the dependency ratio. Although the young dependency ratio shows a weak correlation with savings (-0.44), the old dependency ratio shows a strong correlation with savings (-0.80). The working population, on the other hand, shows a moderate and positive correlation with savings. The fertility rate has a strong negative correlation with the savings rate, whereas the population growth rate has a slight positive correlation.

## *2. Pre-Estimation Test*

This section includes testing for unit roots to assess the stationarity of the variables. It also checks for the optimal lag selection. In addition, the long-term relationship was checked using the ARDL bound cointegration test.

### *a) Unit Root Test*

To avoid spurious result, the Augmented Dickey Fuller (ADF), Dickey-Fuller (DF) GLS, and Unit Root with Structural Break were conducted to test for the stationarity property of the data to be utilized for the study. This is summarized in Table 5.

**TABLE 4**

Correlation Matrix

| | SAV | YDR | ODR | TDR | WP | PGR | FR |
|---|---|---|---|---|---|---|---|
| SAV | 1 | | | | | | |
| YDR | -0.4448 | 1 | | | | | |
| ODR | -0.8014 | 0.5199 | 1 | | | | |
| TDR | -0.4849 | 0.6986 | 0.6493 | 1 | | | |
| WP | 0.4824 | -0.5986 | -0.5848 | -0.9910 | 1 | | |
| PGR | 0.3014 | 0.2397 | 0.2916 | 0.2482 | -0.2527 | 1 | |
| FR | -0.8628 | 0.6173 | 0.5276 | 0.6557 | -0.6556 | 0.4550 | 1 |

*Source:* Author's Compilation, 2024.

**TABLE 5**

Augmented Dickey Fuller Unit Root Test Result

| Var. | | ADF Statistic | ADF Statistic | DF-GLS Statistic | DF-GLS Statistic | Unit Root with Structural Break | Unit Root with Structural Break |
|---|---|---|---|---|---|---|---|
| | | Levels | 1st Diff. | Levels | 1st Diff. | Levels | 1st Diff. |
| SAV | a | -2.694* | -7.646*** | -1.06 | -7.75*** | -4.26* | -8.85*** |
| SAV | b | -3.690** | - | -3.11* | -8.10*** | -4.45 | -8.76*** |
| YDR | a | 2.883 | -3.401** | 3.18 | -2.27** | -2.81 | -4.62** |
| YDR | b | -2.987 | -3.937** | -2.85 | -4.29*** | -4.37 | -5.51*** |
| ODR | a | -0.088 | -5.222*** | 0.37 | -1.4 | -2.64 | -6.25*** |
| ODR | b | -5.295*** | - | -6.89*** | - | 5.79**** | - |
| WP | a | 0.436 | -4.280*** | 2.93 | -0.798 | -2.93 | -4.64** |
| WP | b | -9.900*** | - | -3.11** | - | -4.53** | - |
| PGR | a | -1.603 | -4.835*** | 1.29 | -3.24*** | -2.21 | -4.62** |
| PGR | b | -1.216 | -11.048*** | -0.93 | -3.60** | -3.38 | -5.23** |
| FR | a | 1.096 | -3.272** | 0.27 | -2.02** | -3.83 | -12.90*** |
| FR | b | -0.282 | -3.475* | -1.22 | -2.71 | -3.47 | -13.09*** |

*Source:* Authors' estimation. Where a represents the intercept only and b represents the trend & intercept and ***, **, * represent stationarity at 1, 5 & 10 per cent respectively.

The ADF, DF-GLS, and Unit root with structural break all indicated mixed stationarity, with some variables I (0) and others I(1). With a mixed order of integration, I (0) and I (1), there is evidence of a long-term association among the variables. This was tested using the ARDL bound cointegration test.

**TABLE 6**

ARDL Bound Cointegration Test

| Test Statistic | Value | Significance Level | I (0) | I (1) |
|---|---|---|---|---|
| F-statistic | 6.4629 | 10% | 2.49 | 3.38 |
| K | 5 | 5% | 2.81 | 3.76 |
| | | 2.5% | 3.11 | 4.13 |
| | N = 40 | 1.0% | 3.50 | 4.63 |

*Source:* Author's estimation.

### *b) ARDL Bound Test*

The existence of a long-run relationship among the variables under study is examined using the ARDL bounds test. The results are presented in Table 6.

According to the results of the F-Bounds test, there is a long-term link between the variables in the study because the calculated F-statistic (6.462959) exceeds the critical values at the 5 per cent significance level (3.257 for I(0) and 4.431 for I(1)).

### *c) Model Estimation*

The ARDL model's short-term, long-term and error correction coefficients are shown in Table 7 while the baseline Quantile ARDL model is summarized in Table 8.

### *d) Robustness Check with the Inclusion of Other Socioeconomic and Macroeconomic Factors*

To check our estimates are robust, we incorporated socioeconomic and macroeconomic variables in the study to see if the relationship remains the consistent. The new ARDL result is shown in Table 9 while the new Quantile ARDL results are shown in Table 10 and Table 11.

**TABLE 7**

Baseline ARDL Model

| Variable | Coefficient | T-Statistic |
|---|---|---|
| Short Run | Short Run | Short Run |
| $D(YDR)_t$ | -2.2596 | -3.697*** |
| $D(ODR)_t$ | -2.2748 | -3.957*** |
| $D(WP)_t$ | 4.9048 | 3.705*** |
| $D(PGR)_t$ | 1.8979 | 2.275** |
| $D(FR)_t$ | -0.272 | -0.402 |
| ECM | -0.4148 | -7.627*** |
| Long Run | Long Run | Long Run |
| $YDR_t$ | 3.1929 | 2.364** |
| $ODR_t$ | 2.0978 | 0.921 |
| $WP_t$ | 4.3463 | 9.432*** |
| $PGR_t$ | 2.1109 | 2.579** |
| $FR_t$ | 2.1459 | 2.360** |

*Source:* Author's estimation. ***, **, * represent stationarity at 1, 5 & 10 per cent respectively.

**TABLE 8**

Baseline Quantile ARDL Result

| Variables | Coefficients 0.25 Quantile | Coefficients 0.5 Quantile | Coefficients 0.75 Quantile |
|---|---|---|---|
| Short Run | Short Run | Short Run | Short Run |
| $D(YDR)_t$ | -2.28*** | -2.23*** | -2.15** |
| | (-2.92) | (-2.62) | (-2.10) |
| $D(ODR)_t$ | -3.33*** | -2.27*** | -2.20*** |
| | (-4.24) | (-3.43) | (-3.12) |
| $D(WP)_t$ | 2.41*** | 3.50*** | 3.59*** |
| | -2.76 | -3.49 | -4.23 |
| $D(PGR)_t$ | -1.32*** | -1.25*** | -1.19*** |
| | (-4.89) | (-3.04) | (-2.81) |
| $D(FR)_t$ | -4.20*** | -3.15*** | -2.22*** |
| | (-2.86) | (-2.71) | (-3.01) |
| ECT | -0.22*** | -0.30*** | -0.50*** |
| | (-3.03) | (-3.82) | (-4.82) |
| Long Run | Long Run | Long Run | Long Run |
| $YDR_t$ | -3.15 | 3.20*** | 3.29*** |
| | (-3.13) *** | -4.23 | -4.54 |
| $ODR_t$ | 0.02 | 0.09 | 0.11 |
| | -1.07 | -1.28 | -1.43 |
| $WP_t$ | 2.25** | 3.35*** | 3.47*** |
| | -2.26 | -3.05 | -3.89 |
| $PGR_t$ | -0.33*** | 3.26*** | -0.30*** |
| | (-4.2) | -3.2 | (-3.11) |
| $FR_t$ | -1.23** | 1.15** | 1.21 |
| | (-2.01) | -2.25 | -3.16 |

*Source:* Author's estimation. ***, **, * represent stationarity at 1, 5 & 10 per cent respectively.

**TABLE 9**

Standard ARDL Result

| Variable | Coefficient | Coefficient | T-Statistic |
|---|---|---|---|
| Short Run | Short Run | Short Run | Short Run |
| $D(YDR)_t$ | -1.7 | -1.7 | -3.02*** |
| $D(ODR)_t$ | -1.32 | -1.32 | -3.10*** |
| $D(WP)_t$ | 2.14 | 2.14 | 3.20*** |
| $D(PGR)_t$ | 1.82 | 1.82 | 1.75* |
| $D(FR)_t$ | 0.21 | 0.21 | 4.23*** |
| $D(GDPPC)_t$ | -0.36 | -0.36 | -0.61 |
| $D(EDU)_t$ | -0.72 | -0.72 | -2.08** |
| $D(EMP)_t$ | 0.82 | 0.82 | 2.13*** |
| $D(INF)_t$ | -0.52 | -0.52 | -2.91*** |
| $D(INTR)_t$ | 0.21 | 0.21 | 2.12** |
| ECT | -0.41 | -0.41 | -6.01*** |
| Long Run | Long Run | Long Run | Long Run |
| $YDR_t$ | -1.72 | -1.99** | -1.99** |
| $ODR_t$ | -1.13 | -0.85 | -0.85 |
| $WP_t$ | 2.11 | 7.05*** | 7.05*** |
| $PGR_t$ | 1.8 | 2.33** | 2.33** |
| $FR_t$ | 0.38 | 3.61*** | 3.61*** |
| $GDPPC_t$ | 1.54 | 1.88* | 1.88* |
| $EDU_t$ | 0.22 | 2.50** | 2.50** |
| $EMP_t$ | 0.31 | 2.89*** | 2.89*** |
| $INF_t$ | -0.29 | -2.22** | -2.22** |
| $INTR_t$ | 0.23 | 2.61** | 2.61** |

*Source:* Author's estimation. ***, **, * represent stationarity at 1, 5 & 10 per cent respectively.

**TABLE 10**

Quantile ARDL Result (Short run)

| Variable | Coefficient (t-statistics) 0.25 Quantile | Coefficient (t-statistics) 0.5 Quantile | Coefficient (t-statistics) 0.75 Quantile |
|---|---|---|---|
| $D(YDR)_t$ | -2.22** | -1.93** | -1.82** |
| | (-2.02) | (-2.30) | (-2.16) |
| $D(ODR)_t$ | -2.55*** | -2.05*** | -1.98** |
| | (-4.21) | (-3.18) | (-2.12) |
| $D(WP)_t$ | 2.05** | 2.95*** | 2.21*** |
| | -2.31 | -4.12 | -3.41 |
| $D(PGR)_t$ | -0.98*** | -1.28*** | -1.22** |
| | (-3.48) | (-2.99) | (-2.36) |
| $D(FR)_t$ | 0.39*** | 0.45*** | 0.52*** |
| | -3.01 | -2.7 | -2.73 |
| $D(GDPPC)_t$ | -1.08 | -1.02 | -0.59 |
| | (-1.56) | (-0.78) | (-1.01) |
| $D(EDU)_t$ | 0.25 | 0.29 | 0.36 |
| | -1.01 | -1.62 | -1.12 |
| $D(EMP)_t$ | -0.21 | -0.23 | -0.28 |
| | (-0.52) | (-1.13) | (-1.43) |
| $D(INF)_t$ | -0.33*** | -0.44*** | -0.52*** |
| | (-2.99) | (-2.98) | (-3.61) |
| $D(INTR)_t$ | 0.20** | 0.26*** | 0.29*** |
| | -2.03 | -2.91 | -3.14 |
| ECT | -0.32*** | -0.55*** | -0.59*** |
| | (-2.92) | (-3.50) | (-4.52) |

*Source:* Author's estimation. ***, **, * represent stationarity at 1, 5 & 10 per cent respectively.

**TABLE 11**

Quantile ARDL Result (Long run)

| Variable | Coefficients (t-statistics) 0.25 Quantile | Coefficients (t-statistics) 0.5 Quantile | Coefficients (t-statistics) 0.75 Quantile |
|---|---|---|---|
| $YDR_t$ | -1.83*** | -1.90*** | -2.01*** |
| | (-3.09) | (-3.41) | (-4.20) |
| $ODR_t$ | -0.08 | -0.14 | -0.22 |
| | (-1.42) | (-1.61) | (-1.65) |
| $WP_t$ | 1.43** | 2.81*** | 3.21*** |
| | -2.05 | -2.71 | -3.21 |
| $PGR_t$ | 0.26*** | 0.82*** | 0.23*** |
| | -3.13 | -3.52 | -3.21 |
| $FR_t$ | -0.33*** | -0.42*** | -0.52*** |
| | (-3.11) | (-3.41) | (-4.05) |
| $GDPPC_t$ | -1.25** | -1.55*** | -1.89*** |
| | (-2.43) | (-2.90) | (-2.98) |
| $EDU_t$ | -0.32*** | -0.39*** | -0.56*** |
| | (-2.84) | (-3.15) | (-3.50) |
| $EMP_t$ | 0.32 | 0.39 | 0.48 |
| | -1.06 | -1.41 | -1.56 |
| $INF_t$ | -0.41*** | -0.56*** | -0.71*** |
| | (-2.98) | (-3.28) | (-3.93) |
| $INTR_t$ | 0.25** | 0.57*** | 0.89*** |
| | (2.56) | (3.02) | (3.72) |

*Source:* Author's estimation. ***, **, * represent stationarity at 1, 5 & 10 per cent respectively.

## V. Discussions and Policy Implications of Findings

### *1. Standard ARDL Result*

The findings from the ARDL analysis offer crucial insight into the demographic-savings nexus in Nigeria, particularly when understood through the Life-Cycle Hypothesis (LCH) perspective. The LCH suggests that people save during their productive years and dissave during dependency phases. Thus, young and old-age dependency reduces aggregate savings, while the working-age population increases them. This research both confirms and challenges these propositions, showing that the dynamics of savings behaviour in a developing economy such as Nigeria are multifaceted.

The young dependency ratio has a negative and notable impact on savings rate in the short-run (-2.26), which is consistent with the LCH and previous research (Yorulmaz, 2010; Akeju, 2016; Adewale & Abeeb, 2025) who noted that youth dependency lowers household savings in the short-run in Turkey and Nigeria, respectively. This confirms the classical view that child-rearing expenses limit short-term saving. Nevertheless, the long-run impact of youth dependency turned out to be positive and significant on savings (3.19), which contradicts the LCH but concurs with the results of Olanipekun and Akeju (2017), Ogunjimi and Oladipupo (2018), and Yuanyuan and Kassim (2023). These studies, conducted in ECOWAS, Nigeria, and China, respectively, indicated that households adjust their saving policies in response to increased dependency, occasionally augmenting precautionary saving in anticipation of future demands. This behaviour change is indicative of the Precautionary Savings Hypothesis and the Behavioural Life-Cycle Hypothesis (Shefrin & Thaler, 1988), which acknowledges forward-looking behaviour and psychological motives in the saving choices. The policy implication is twofold. First, family planning is necessary to reduce dependency burdens in the short term. Second, investments in child education, skills development, and financial literacy can turn dependents into future savers.

In contrast to youth dependency, old-age dependency shows a different effect. It produces a significant negative impact on short- and long-run savings (-2.27 and -2.10 respectively), demonstrating the LCH assumption that the elderly dissave and impose a financial burden on households. This aligns with Yorulmaz (2010), Akeju (2016), and Hsu and Lo (2019), who established that ageing populations lower savings in Turkey, Nigeria and Japan, respectively. However, this differs from the findings of Hassan et al. (2019), which highlighted that elderly individuals could positively affect growth by maintaining economic participation or using the pension funds. These contrasts indicate that the Permanent Income Hypothesis (Friedman, 1957), which posits that older adults whose pensions are stable or who strive to preserve their relative living standards, might be able to explain the non-dis-saving behaviour of the elderly. The policy implication in this case is obvious in Nigeria, where the pension system is still weak: reinforcing social security and promoting post-retirement employment oppor-

tunities would help turn the elderly population of net dis-savers into future contributors to national savings.

Building on the analysis of old-age dependency, the working-age population presents another dynamic. It was observed to positively influence savings in the short and long run (4.35 and 4.90). The result supports the LCH and is consistent with Olabiyi (2018), who demonstrated that savings are the driving force of growth in Nigeria among the working population. It also contributes to the broader literature by showing that Nigeria's demographic dividend can be realised if the working-age population is economically productive and active. Nonetheless, it questions Olanipekun and Akeju (2017), who concluded that even working-age populations in certain ECOWAS countries negatively influenced savings, probably because of large dependency loads. In Nigeria, this underscores the need to implement policies that broaden job prospects, improve labour market conditions, and raise incomes. Job creation, entrepreneurship support, and wage growth policies are essential to ensure that the working population translates its earning capacity into sustainable savings and investments.

Surprisingly, the level of population growth positively affected savings in the short and long term (1.90 and 2.11), contrary to LCH's assumption that larger populations would put pressure on household resources and reduce savings. This observation is consistent with the conclusions of Ogunjimi and Oladipupo (2018), who identified positive contributions from both young people and the working-age population in Nigeria, implying that, amid rapid population growth, households might resort to anticipatory savings behaviour, in accordance with the Precautionary Savings Hypothesis and the Behavioural LCH. Instead of declaring population growth a bad thing, this implies that it can be utilised, provided it is coupled with policies that enhance financial inclusion, expand access to formal savings tools, and build human capital. Nigeria can turn demographic pressure into higher aggregate savings by ensuring that larger populations are better educated, healthier, and more financially empowered.

Lastly, fertility rate was not found to have a significant effect in the short run (-0.27) but was positive and significant in the long run (2.14). This is contrary to LCH, which presumes that higher fertility has both short- and long-term saving costs, but the result is similar to that of Yuanyuan and Kassim (2023), who demonstrated that institutional and cultural contexts influenced Chinese fertility dynamics. The beneficial long-run effect could be the vision of children as future security providers in Nigeria, a vision more aligned with the Overlapping generations model, which emphasises social standards and expectations between generations as determinants of saving behaviour. The policy implication is that instead of relying on fertility reduction, Nigeria needs to invest in maternal and child health, education and skills development so that increased fertility can translate into economic and savings benefits in the long term. The error correction term (ECM) emphasises the adjustment process towards equilibrium by showing that approximately 41.48 per cent of short-run variance is corrected in the long run, implying that the process of driving short-run disequilibrium back to long-run equilibrium is quick.

### *2. Quantile ARDL Result*

The Quantile ARDL both confirms and challenges the predictions of the Life-Cycle Hypothesis (LCH) in Nigeria. At the lower quantiles, the young dependency ratio (YDR) lowers savings (-2.28 at the 0.25 quantile), which is in line with the LCH and previous studies (Yorulmaz, 2010; Akeju, 2016; Choudhury & El Harbi, 2018; Adewale & Abeeb, 2025), who hypothesize that dependency burdens lower household savings. However, the negative effect weakens at higher quantiles (–2.15 at the 0.75 quantile), and in the long run, YDR turns positive (3.20 at the median quantile and 3.29 at the higher quantile). This reinforces the works of Olanipekun and Akeju (2017), Ogunjimi and Oladipupo (2018), and Yuanyuan and Kassim (2023), who indicate that wealthier households would turn youth dependency into future savings by investing in human capital and taking precautions. The policy implication is clear: stronger family planning policies and greater investments in education are required so that larger youth cohorts can become an asset for long-run savings rather than a liability.

Moving from youth to old-age dependency, the ODR decreases short-run savings at all quantiles (–3.30, -2.27, and -2.23), once again validating the prediction of the LCH and the results of Yorulmaz (2010) and Hassan et al. (2019). However, the smaller negative impact at higher quantiles implies that better-off households can cope with old-age burdens more readily because pensions cover them and remain economically active, which is consistent with the overlapping generations (OLG) and precautionary savings models. The long-run effect of ODR is positive but insignificant, indicating that the tendency of older populations to increase savings in the presence of institutional safety nets is weak. This highlights the importance of pension reform and extending social security to cover more people, to reduce reliance on children as insurance in old age.

The working-age population (WP) has a positive and significant effect on savings across all quantiles (2.41, 3.50, and 3.57), reinforcing the LCH and consistent with Olabiyi (2018). The fact that the effect is greater at higher quantile points to the Permanent Income Hypothesis (PIH), which states that more prosperous households save more because they have better labour market opportunities. This necessitates measures that increase productive employment, promote skill development, and enable entrepreneurship, thereby increasing labour incomes and aggregate savings.

The rate of population growth (PGR) depresses savings in the short run (–1.32 at low quantiles, -1.19 at high quantiles), as anticipated by LCH, since rapid population growth is expected to strain household resources. Nonetheless, at the median quantile, the long-run effect becomes positive (3.26), indicating that population growth can offset savings under stable economic forces, consistent with the relative income hypothesis that children are long-run assets. This duality implies that, even though population growth control is critical, investments in infrastructure, employment, and urban planning are required to turn population growth into an asset.

The Fertility Rate (FR) negatively affects savings at lower and middle quantiles in the short run (–4.22 and –3.20), though the effect weakens at higher quantiles (–2.15). In the long run, fertility turns positive at the median and high quantiles. Fertility is positive in the long run at the median and high quantiles, indicating that richer households view children as long-term investments, which is consistent with behavioural adjustments in emerging economies. This reinforces the results of Ogunjimi and Oladipupo (2018) and further highlights the weaknesses of a unified LCH framework. The policy initiatives must then be targeted at family planning, maternal health, and education. Still, we must also invest in youth development to ensure that fertility-related population growth enhances future labour force participation and savings.

Lastly, the error-correction mechanism (ECM) adjusts faster to the equilibrium at high quantiles, with approximately 22, 30, and 50 per cent corrected at the lower, median, and higher quantiles, respectively. This implies that rich households adapt more quickly to economic shocks, which supports the precautionary savings hypothesis and underscores the significance of financial depth in smoothing consumption. Enhancing resilience is therefore critical: policies should strengthen financial markets, expand savings incentives, and stabilise inflation and interest rates.

### *3. Robustness Check*

The robustness check in Tables 10 and 11, which incorporates key socioeconomic and macroeconomic variables into the ARDL framework, provides a clearer and more realistic picture of the relationship between demographics and savings in Nigeria. By introducing GDP per capita (GDPPC), education (EDU), employment (EMP), inflation (INF), and interest rate (INTR), the extended model reveals the extent to which the earlier demographic coefficients were shaped by omitted variable bias. In the initial ARDL estimation, demographic variables appeared to drive most of the variation in the savings rate. However, once the socioeconomic environment is taken into account, it becomes clear that household saving decisions are shaped not only by demographic pressures but also by the broader structural conditions that determine income, employment prospects, and financial security. As a result, the magnitude and sometimes even the direction of the demographic coefficients change when the controls are added.

The most notable adjustment occurs with the young dependency ratio. In the baseline ARDL and Quantile ARDL models, before socioeconomic controls were introduced, the young dependency ratio exhibited a contradictory pattern. It was negative and significant in the short run but positive and significant in the long run. This long-run positive effect weakened the applicability of the Life Cycle Hypothesis in Nigeria. However, when the socioeconomic variables are included, this pattern fundamentally changes. Youth dependency becomes consistently negative in both the short run and the long run across both the standard ARDL and Quantile ARDL

models. This adjustment makes the findings much more consistent with the classical Life Cycle Hypothesis, in which higher youth dependency is expected to reduce savings due to the financial burden associated with child-rearing.

The fact that the long-run coefficient for youth dependency turns negative once socioeconomic factors are added indicates that the earlier positive long-run effect did not reflect the true relationship. Instead, it was likely capturing structural weaknesses in the Nigerian economy. Low school enrolment, high unemployment, low income growth, and persistent inflation limit the capacity of young dependents to transform into productive savers in adulthood. Under these conditions, a large youth population imposes a sustained financial drain on households. Even in the Quantile ARDL model, where the negative effect diminishes at higher quantiles, indicating that wealthier households can cope better with the burden, the overall long-run impact remains negative. This shows that without strong socioeconomic foundations, Nigeria cannot convert its youthful population into a demographic dividend.

These findings reinforce the need to interpret demographic influences on savings in light of Nigeria's socioeconomic landscape. The size of the youth population is not the sole determinant of savings outcomes. What matters is the economic context that shapes the opportunities available to young people as they transition into the labour force. The robustness results, therefore, clearly point to policy priorities that strengthen the environment in which young people develop. Expanding access to quality education at all levels, creating stable and productive employment opportunities and reducing the inflation rate are crucial. If these policies are implemented, Nigeria can eventually turn its large youth population from a long-term burden on household savings into a source of economic strength and financial stability.

### *4. Diagnostic Test*

The diagnostic tests help determine the model's robustness and significance; Table 12 provides an overview.

The model diagnostics indicate a strong fit and consistent statistical performance. The coefficient of determination ($R_2$) is 0.88, meaning that the explanatory variables account for approximately 88 per cent of the fluctuations in the dependent variable. This indicates that the model has a good explanatory power because it surpasses the 0.5 criterion. The overall statistical significance of the model is confirmed by the F-statistic, which has a p-value of 0.000. There is no indication of autocorrelation in the residuals, as indicated by the Durbin-Watson statistic of 2.20, which is within the permissible range of 1.5 to 2.5. A p-value of 0.6945 from the Breusch-Pagan-Godfrey test indicates the absence of heteroscedasticity. There is no serial correlation in the residuals, according to the Breusch-Godfrey test, which yields p-values of 0.1248. According to the F-statistic's p-value of 0.7374 from the Ramey RESET test for model linearity, the model is both linear and appropriately specified. The residuals

**TABLE 12**

Summary of Post-Estimation Tests

| Test | Statistic | Prob. (Statistics) |
|---|---|---|
| $R_2$ | Goodness of Fit test | 0.8800 |
| F-statistic | Overall Significance | 0.0000 |
| Heteroscedasticity | Breusch- Pagan – Godfrey | 0.6945 |
| Serial Correlation LM | Breusch- Godfrey | 0.1248 |
| Linearity Test | Ramsey Reset | 0.7374 |
| Normality Test | Jarque Berra | 0.8896 |

*Source:* Author's estimation.

appear to be normally distributed, consistent with the model assumptions, as indicated by the p-value of 0.8896 from the Jarque-Bera normality test.

### *5. Stability Diagnostic Test*

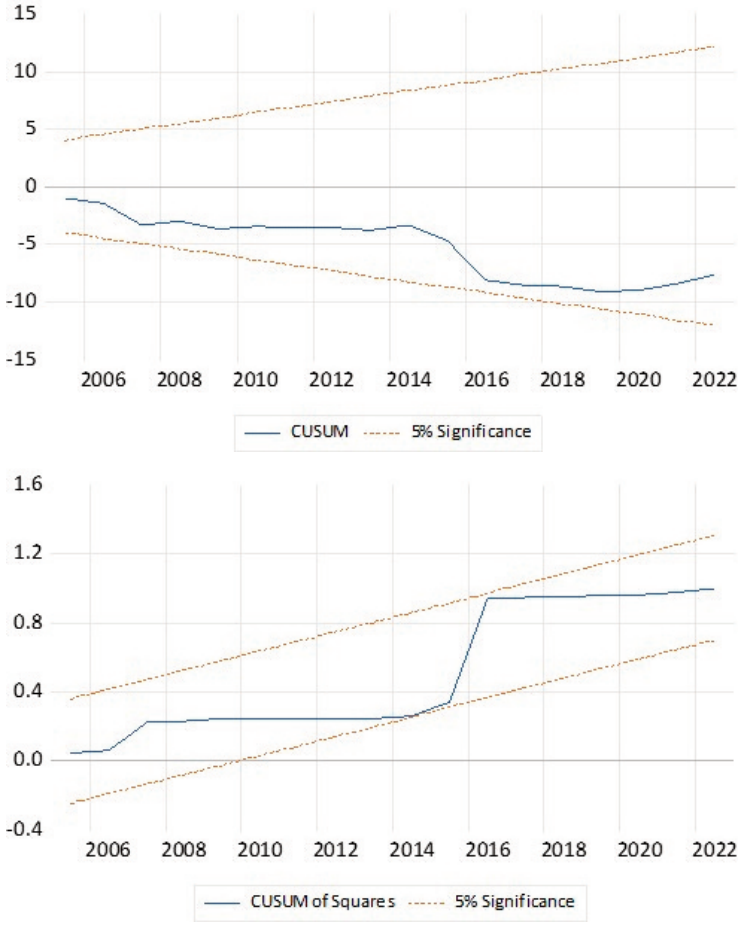
CUSUM and CUSUM of Squares Test

In Figure 3, Both the CUSUM and the CUSUM of Squares fall inside the lower and upper bound's 5 per cent critical levels. This suggests that the model is reliable and stable for making predictions.

## VI. Conclusion and Policy Recommendation

This study investigated how demographic factors influence savings in Nigeria using the Standard ARDL and Quantile ARDL models. The results show that demographic pressures play a major role in shaping household saving behaviour. In the short run, the Life-Cycle Hypothesis is supported because increases in both youth and old-age dependency reduce savings. In the long run, old-age dependency continues to reduce savings, while the earlier positive long-run effect of youth dependency disappears once socioeconomic factors are taken into account. After these factors are included, youth dependency consistently becomes negative, indicating that poor economic conditions limit young dependents' ability to become productive contributors in the future.

The working-age population shows a positive effect on savings across all models. This confirms that Nigeria's working-age group is central to building national savings when they are actively engaged in productive work. Population growth and fertility show mixed effects. They reduce savings in the short run but become positive in the long run under better economic conditions or for higher-income groups. This means




*Source:* Authors' estimation.

**FIGURE 3**

Graph of CUSUM and CUSUM of Squares

that population growth can become beneficial only when households have enough income and access to opportunities. The error-correction results also show that households with greater economic strength adjust more quickly to shocks, helping them maintain steady saving behaviour.

The following recommendations were made based on the findings:

First, Nigeria should strengthen family planning awareness and birth spacing to reduce pressure on household income. Specifically, the National Primary Health

Care Development Agency should train more community health workers in states with the highest fertility rates to distribute free contraceptives at existing Primary Health Centres.

Second, investments in children's education, health and skill development are necessary. Specifically, the Universal Basic Education Commission should create a Child Development Savings Account for every newborn, seeded by the government, withdrawable only for approved education or health expenses.

Third, improvements in Nigeria's pension and social security systems are needed. Specifically, the National Pension Commission should enforce a 'one worker, one RSA' policy, requiring every employed adult, including self-employed workers, to register for a Retirement Savings Account with affordable minimum monthly contributions for informal workers.

Fourth, policies that improve access to steady employment are important. Specifically, the Industrial Training Fund should partner with the National Board for Technical Education to establish more Vocational Enterprise Institutes across Nigeria, training youth annually in high-demand trades with startup toolkits upon graduation.

Fifth, improving the quality of education at all levels is crucial. Specifically, the Federal Ministry of Education should link a portion of state education funding to measurable improvements in secondary school completion rates and financial literacy test scores.

Sixth, maintaining price stability is important for encouraging long-term saving behaviour. Specifically, the Central Bank of Nigeria should introduce a Savings Protection Bond that offers interest rates above inflation, with a low minimum subscription requirement to encourage broad participation.

Seventh, population growth and fertility require attention. Specifically, the National Population Commission should launch a Demographic Dividend Roadmap targeting a steady reduction in the total fertility rate over the next decade.

Eighth, the Nigerian Education Loan Fund (NELFUND) should be leveraged to reduce pressure from youth dependency. Under the Student Loan Act, NELFUND provides interest-free loans to cover tuition and living expenses for students at public tertiary institutions. Specifically, NELFUND should partner with the National Pension Commission to automatically enrol each loan beneficiary into the Micro Pension Plan, with a small percentage of monthly upkeep allowances directed into a Retirement Savings Account.

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