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National Savings and Economic Growth Nexus in Nigeria

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Abstract

The study investigates the relationship between national savings and economic growth in Nigeria using time series data from 1981 to 2022. The analysis employs the autoregressive distributed lag (ARDL) model. Findings indicate that in the long run, total savings as a percentage of GDP positively and significantly influence real GDP growth. However, in the short run, this effect remains positive but is statistically insignificant. Additionally, savings and time deposits from other depository institutions contribute positively and significantly to real GDP growth in both the short and long run. Moreover, results reveal that the working-age population exerts a positive but statistically insignificant effect on real GDP growth in the long run, whereas in the short run, its impact is both positive and significant. Similarly, credit to the private sector plays a crucial role in economic expansion, exhibiting a positive and significant influence on real GDP growth in both time horizons. To foster sustained economic growth, policies should be designed to promote total savings, as this would support long-term and short-term economic targets. Furthermore, the central bank should implement strategies to enhance public confidence in financial institutions—including commercial, merchant, non-interest, primary mortgage, and microfinance banks—by enforcing sound regulatory frameworks that support their stability and development.

Keywords: *Economic Growth, Golden Rule, National Savings, Time Deposit, Total Saving*

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Background to the Study

Economic growth is a key macroeconomic goal, representing an increase in a nation's productive capacity and a shift in the GDP growth rate. This objective is particularly significant in developing nations, where economic growth plays a crucial role in shaping national development strategies. According to Picardo (2020), the extent of economic growth over time influences a country's production capacity. Growth in national output and income is directly linked to economic expansion. Eboh, Aduku, and Onwughalu (2022) emphasize that economic growth fosters poverty reduction, enhances the availability of goods and services, promotes job creation, and boosts income generation. Additionally, economic growth contributes to an improved standard of living (Amadeo, 2020). One of the fundamental drivers of economic growth is an increase in national savings.

National savings comprise both private and public savings, representing the portion of income set aside rather than consumed immediately. These savings serve various purposes, including future consumption, investment, and emergency needs. They are widely regarded as a key determinant of economic growth, playing a significant role in capital formation. Increased capital stock resulting from savings enhances income generation and overall economic productivity (Amaefule & Maku, 2019). National savings determine an economy's capacity to invest, which in turn influences economic growth potential. Low savings rates have been identified as a major constraint to sustainable economic growth, particularly in developing nations such as Nigeria (Bangladesh Economic Review, 2023).

The traditional view of savings and economic growth suggests that savings facilitate investment, leading to higher economic growth. The transmission mechanism involves savings contributing to fixed capital accumulation, thereby expanding the stock of physical capital and fostering technological advancements. The extent to which savings drive capital accumulation and economic growth depends on the economy's ability to channel them into productive investments (Ribaj & Maxhuani, 2021). Fluctuations in savings and investment can significantly impact macroeconomic stability and long-term growth (Belloumi & Alshehry, 2018).

Several economic theories emphasize the role of savings in growth acceleration. The neoclassical Solow model, for instance, posits that an increase in the savings rate boosts steady-state output beyond its immediate effect on investment. This occurs because a rise in income leads to higher savings, subsequently increasing investment and driving economic expansion through aggregate demand (Hundie, 2014). Given Nigeria's pressing need for economic growth, the role of savings cannot be overlooked. High national savings can enhance the availability of loanable funds for productive investment, making it a crucial area of focus for policymakers. Consequently, many developing countries, including Nigeria, actively promote savings as part of their economic development strategies.

The impact of national savings on economic growth varies across countries due to differences in institutional frameworks, social structures, and economic conditions. An economy's ability to allocate savings effectively into productive investments determines the extent of its

economic growth benefits. Countries that successfully channel savings into productive ventures experience higher economic expansion. In a bid to encourage savings and investment, Nigeria implemented economic liberalization measures. According to Karimo (2014), Nigeria's economic liberalization can be traced back to the latter half of 1986, with the introduction of the Structural Adjustment Programme (SAP). This study is motivated by the dynamic relationship between national savings and economic growth, particularly how this interplay influences policy decisions. While several studies have explored this relationship, few have applied appropriate growth theories in the Nigerian context.

Achieving strong economic growth depends significantly on robust national savings. Over the years, Nigeria has introduced various policies and programs to stimulate savings and investment. These include interest rate deregulation, economic liberalization, the adoption of a flexible exchange rate system, and wage reforms. Additionally, initiatives such as the Subsidy Reinvestment and Empowerment Programme (SURE-P) in 2013, the National Economic Empowerment Development Strategy (NEEDS) in 2007, and the Community Services Women and Youth Employment (CSWYE) program in 2012 aimed to create an enabling environment for savings and investment. Despite these efforts, Nigeria continues to face low savings rates and modest economic growth.

Ideally, savings should drive investment, leading to higher economic growth. However, Nigeria's economic growth patterns do not seem to reflect its domestic savings levels. In the first quarter of 2023, the country experienced weakened economic growth, with the real GDP growth rate declining from 3.3% in 2022 to 2.4% in Q1 2023. This followed a contraction of approximately 3.62% in the third quarter of 2020. According to Sahara Reporters (2020), Nigeria last recorded such a cumulative GDP decline in 1987, with a drop of about 10.8%. Meanwhile, gross savings as a percentage of GDP fluctuated, rising from 22.36% in 2020 to 25.82% in 2021, before dropping to 20.69% in 2022 and 20.11% in Q4 2023 (Federal Reserve Bank of St. Louis, 2023; World Bank, 2023). These inconsistencies contradict conventional economic thinking, which asserts that savings are essential for investment and growth.

Additionally, Nigeria's economic challenges are compounded by a rapidly growing population and high dependency ratios. If economic growth continues to lag behind population growth, poverty levels are likely to worsen. The country faces significant economic hardships, with sluggish growth and rising poverty rates. Experts argue that Nigeria's low savings and investment rates are major constraints to sustainable growth. Economic theories also suggest that the relationship between savings and growth can be bidirectional.

Previous studies have largely focused on the causal relationship between savings and economic growth or investment and economic growth, yielding mixed findings. Moreover, most research in Nigeria has emphasized private savings, neglecting the broader issue of national savings. Only a few studies have examined national savings using Granger causality to determine its impact on investment (e.g., Alzghoul, Al-Kasasbeh, Alsheikh, & Yamin, 2023; Nwonye, Ihegboro, Onah, & Ojiako, 2022; Ayadi, 2021; Chuba & Ebhotemhen, 2019). This study aims to bridge this gap and contribute to the existing literature. The key research

questions are: What is the impact of total savings on economic growth in Nigeria? How do savings and time deposits of various depository corporations (commercial, merchant, non-interest, primary mortgage, and microfinance banks) influence economic growth in Nigeria? Therefore, this study seeks to examine the relationship between national savings and economic growth in Nigeria by: (i) Assessing the impact of total savings on economic growth. (ii) Analyzing the effects of savings and time deposits from depository corporations on economic growth.

Conceptual Literature

National Savings

The Organisation for Economic Co-operation and Development (OECD, 2023) describes savings as the portion of disposable income that remains after deducting consumption expenditures and adjustments for employment-related pension entitlements. Essentially, it is the income available for acquiring both financial and non-financial assets. Similarly, Hussein, Mohieldin, and Rostom (2017) define savings as the difference between income and consumption, alongside changes in wealth or capital supply.

National savings consist of both private (household) and public (government) savings. These two components collectively form what is referred to as national savings. According to Nasrudin (2022), national savings encompass the total savings from both private and public sectors, contributing to the overall loanable funds available in an economy. Simon-Oke and Jolaosho (2013) define it as the sum of private and public savings, calculated as a nation's income minus consumption and government spending. In a similar vein, Azam et al. (2010) describe national savings as a combination of public and private sector savings within an economy. Temidayo and Taiwo (2011) view it as the portion of income set aside for future consumption, investment, or unexpected contingencies rather than immediate expenditure. Abel, Bernanke, and Croushore (2008) further elaborate that national savings represent the cumulative savings of an entire economy, derived from both private and government sources.

For this study, national savings is defined in line with the perspectives of Simon-Oke and Jolaosho (2013) and Azam et al. (2010), where it represents the combined savings of the private and public sectors within the economy. National savings is typically measured as a percentage of Gross Domestic Product (GDP), net of depreciation. This study, however, will assess total savings in relation to GDP and the savings and time deposits of various depository institutions.

Economic Growth

Economic growth refers to the expansion in the production of goods and services over a specific timeframe (Investopedia, 2023). Raisová and Ďurčová (2014) define it as the enhancement in an economy's capacity to generate goods and services when compared to a previous period. Similarly, Okumoko (2006) describes economic growth as the rate at which real Gross National Product (GNP) increases, reflecting total expenditures on final goods and services produced within a country within a given year.

Real Gross Domestic Product (RGDP) is globally recognized as a fundamental measure of economic growth, serving as a key indicator of a nation's economic performance. This study adopts real GDP growth as a percentage of GDP to evaluate economic growth.

The relationship between national savings and economic growth is primarily rooted in the fact that increased savings lead to higher investments, which, in turn, drive economic expansion. When the national savings rate rises, it contributes to a sustained increase in output. This, in turn, boosts income levels, which further elevates savings and investment. Consequently, heightened investment stimulates economic growth by increasing aggregate demand.

Theoretical Literature

Neoclassical growth theory

This study is grounded in the neoclassical growth theory, which was introduced by Robert Solow and Trevor Swan in 1957. The theory emphasizes capital accumulation and its relationship with savings decisions, among other economic factors. It examines how an economy attains a specific growth rate due to external influences such as population expansion and technological advancements. According to the Solow growth model, key determinants of economic growth include the savings rate, population growth, and technological progress (Banton, 2023; Ding & Knight, 2008). The model treats these factors as external variables that influence economic performance.

In the neoclassical framework, capital and labor serve as fundamental inputs in production, contributing to output through their respective marginal productivity (Banton, 2023; Koutun & Karabona, 2013; Ding & Knight, 2008). The theory posits that, in the long run, economic growth is primarily driven by technological progress, which occurs independently of internal economic dynamics. As a result, economies transition toward a stable, steady-state growth path through endogenous adjustments in factor accumulation. However, savings and investment decisions, as well as capital and technological growth, are assumed to be externally determined (Chirwa & Odhiambo, 2018; Ding & Knight, 2008).

The neoclassical growth model incorporates an aggregate production function, which is mathematically represented as follows:

$$Y(t) = [A(t), K(t), L(t)] \quad . \quad . \quad . \quad (1)$$

Where:
Y(t) = the aggregate output or real income at time t
K(t) = capital input at time t
L(t) = labour input at time t
A(t) = level of technology at time t

The influence of time on output is reflected through the variables A, K, and L. In this context, technology enhances labor efficiency, meaning that *AL* represents effective labor. Based on these assumptions, the neoclassical production function can be expressed using the Cobb-

Douglas framework at time *t*, maintaining constant returns to scale, as outlined in equation (2).

$$Y(t) = [A(t), K(t)^{\alpha}), L(t)^{1-\alpha} \qquad 0 < a > \quad . \quad . \quad . \qquad (2)$$

Where:
α = a share of capital in total output and
1-α = a share of output paid to labour.

Capital and technology expand at exogenous rates, denoted as *n* and *g*, where *n* represents population growth and *g* signifies the growth rate of labor productivity. The theory emphasizes that capital accumulation serves as the primary driver of economic growth. Any change in capital directly influences the overall income level. The growth of capital is positively associated with investment levels, while it is negatively affected by the depreciation rate, population growth, and technological advancement (Koutun & Karabona, 2013; Solow, 1956).

In essence, an increase in national savings leads to higher investment. Moreover, in a country experiencing rapid population growth, capital and output per worker tend to be lower, as savings are utilized to sustain the capital-labor ratio. According to the Solow model within the neoclassical growth framework, nations that allocate a larger portion of their output to savings experience increased capital accumulation due to higher investment, resulting in greater output and, consequently, enhanced economic growth—assuming all other factors remain constant.

Harrod-Domar Growth Theory

The Harrod-Domar model, independently developed by Sir Roy Harrod in 1939 and Evsey Domar in 1946, explains economic growth based on savings levels and the capital-output ratio. According to the model, a higher savings rate provides more financial resources for firms to invest, leading to an expansion of capital stock. This investment drives economic growth by increasing the production of goods and services. The capital-output ratio indicates how efficiently investments contribute to economic output. A lower capital-output ratio signifies improved productivity, as more output is generated from fewer inputs, thereby fostering higher economic growth (Betz, 2018; Piętak, 2014). In simple terms, net national savings (*S*) represents a fraction (*s*) of national income (*Y*), expressed mathematically as (Betz, 2018):

$$S = sY \qquad . \quad . \quad . \qquad (3)$$

Where:
S = Net national savings
S = Proportion of national income, and
Y = National income
Net Investment (I) is defined as the change in the capital stock, **k,** and represented as in equation (2):

$$\mathbf{I = \Delta k} \qquad . \quad . \quad . \qquad (4)$$

But, total capital stock, k, relates to output Y, as expressed by the capital-output ratio:

$$k\backslash y = c, \text{ or } \Delta k = c\Delta Y \quad . \quad . \quad (5)$$

Because net national savings, S, must equal net investment, I, we can write as:

$$S = I \quad . \quad . \quad . \quad (6)$$

The model implies that for developing nations to attain economic growth, governments should promote savings and facilitate technological progress. The Harrod-Domar model serves as a foundation for understanding economic growth and has significantly influenced government policy decisions.

The Golden Age and Golden Rule of Accumulation

Edmund Phelps introduced the Golden Rule of Accumulation in 1961. According to Jhingan (2004), in an optimal economic state referred to as a "golden age," per capita consumption reaches its highest level when the savings rate matches the profit rate. If the savings rate falls below the profit rate, per capita consumption remains below its potential maximum. Conversely, if the savings rate surpasses the profit rate, per capita consumption declines. The specific savings rate that maximizes per capita consumption is known as the golden rule savings rate or the optimal savings rate. When each generation, both present and future, receives the same level of consumption, the highest possible per capita consumption is referred to as the golden rule consumption rate.

In a golden age, key economic variables such as consumption, output, and capital stock grow at a uniform rate, denoted as *g*, which represents the equilibrium growth rate. The relationship between the capital accumulation ratio (or investment ratio) and *g* remains independent. The presence of *g* indicates that capital and labor are interchangeable, allowing the capital-output ratio to adjust according to the savings rate, *s*. Under equilibrium growth conditions, the capital-output ratio is defined as follows:

$$K^*/Q^* = s/g \quad \text{Or} \quad g = S(Q^*/K^*) \quad . \quad . \quad . \quad (7)$$

In equilibrium, *K* and *Q* represent the steady-state values of capital and output, respectively. The savings rate (*s*) influences the capital-output ratio (*K/ Q*), while the golden age growth rate (*g*) remains independent of the savings rate. If two economies follow golden age growth paths with identical growth rates, the one with a higher savings rate will have a greater capital-output ratio. Given that marginal products remain positive, this leads to an increased output level. Although the savings rate influences the economy's growth level, it does not determine the golden age growth rate.

A higher savings rate results in a higher output level. However, the extent of this increase depends on the marginal product of capital (*r*). A small increase in capital (ΔK) leads to an increase in output by $r\Delta K$, but this additional output is not immediately available for consumption. Instead, an increase in capital necessitates further investment in both the present and the future to maintain capital stock growth at a constant rate (*g*).

If r exceeds g ($r > g$), additional capital leads to increased consumption both now and in the future. Conversely, if r is less than g ($r < g$), more capital allocation shifts towards investment, reducing current consumption. When the marginal product of capital equals the rate of growth ($r = g$), consumption reaches its maximum level. The profit rate is incorporated into the marginal product of capital. Under the Golden Rule of Accumulation, the optimal level of capital is the one where the profit rate equals the growth rate ($r = g$), ensuring maximum sustainable consumption (Jhingan, 2004).

Empirical Literature Review

The relationship between savings, investment, and economic growth in Jordan from 1980 to 2020 was analyzed by Alzghoul, Al-Kasasbeh, Alsheikh, and Yamin (2023) using the Autoregressive Distributed Lag (ARDL) Bounds test method. Their findings revealed a significant link between these economic factors.

Liu and Ma (2022) investigated whether traditional growth theories explain economic growth in East Asia by assessing the effect of savings rates on economic expansion. Their study encompassed 46 Asian countries from 1969 to 2021, employing the fixed-effects model. The results indicated that gross domestic savings, GDP per capita, and urban population growth significantly influenced GDP growth. It was also established that the savings rate had a strong positive effect on economic growth in East and South Asia. Furthermore, savings positively impacted GDP growth in high-income and upper-middle-income countries but showed no significant effect in lower-middle-income nations.

Nwonye, Ihegboro, Onah, and Ojiako (2022) explored how total savings, private consumption expenditure, gross fixed capital formation, and credit to the private sector influenced Nigeria's GDP from 2011 to 2020. Using multiple regression analysis, their research found that total savings positively and significantly impacted GDP. Conversely, private consumption expenditure had a negative yet insignificant effect, while private-sector credit positively influenced economic growth.

Ayadi (2021) assessed the role of financial development and savings in Nigeria's economic progress from 1981 to 2015. The study applied kernel quantile regression, ordinary least squares (OLS), and ARDL models, revealing that savings contributed positively to economic growth. It also highlighted a threshold effect of savings on Nigeria's economic performance.

In Kosovo, Ribaj and Mexhuani (2021) investigated the correlation between savings and economic growth from 2010 to 2017. Using the Granger causality test and regression techniques, they found that deposits significantly contributed to economic expansion, supporting investment, production, and employment. Sellami, Bentafat, and Rahmane (2020) examined how domestic savings influenced Algeria's economic growth between 1980 and 2018 using the ARDL model. The study revealed that savings had significant effects on economic performance in both the short and long run. Chuba and Ebhotemhen (2019) assessed the impact of gross domestic savings on Nigeria's GDP from 1986 to 2019 using an error correction model (ECM). Their findings confirmed a strong positive link between savings and GDP growth.

The impact of savings and investment on Nigeria's economy from 1970 to 2015 was analyzed by Odeh, Effiong, and Nwafor (2017) through an error correction method. The study found that gross domestic savings, fixed capital formation, labor force, and savings all played significant roles in driving economic growth.

Ominyi and Okoh (2017) examined the relationship between GDP and private savings in Nigeria from 1986 to 2015, using the Vector Error Correction Model (VECM). Their findings showed a positive relationship between private savings and economic growth. In India, Patra, Murthy, Kuruva, and Mohanty (2017) explored the long-term link between savings and growth from 1950 to 2011 using Granger causality analysis. Their study found that while savings positively influenced economic activity in the long run, economic growth, in turn, drove savings in the short run. Siaw, Enning, and Pickson (2017) analyzed the relationship between domestic savings and economic growth from 1970 to 2013 using Johansen's cointegration and VECM models. The study found that, in the long run, savings, consumer price index, trade openness, and foreign direct investment significantly influenced economic growth. However, in the short run, past savings levels had a negative but insignificant impact on economic growth.

Stephen and Obah (2017) evaluated how national savings affected Nigeria's GDP between 1990 and 2015. Their findings, based on an ordinary least squares (OLS) analysis, confirmed a strong positive relationship between national savings and economic growth. Nwanne (2016) used OLS regression to study the effects of savings and investment on Nigeria's economic development from 1981 to 2014. The findings indicated that changes in gross domestic savings negatively affected economic growth, whereas investment had a significantly positive influence. Ojiegbe, Duruechi, and Makwe (2016) assessed the link between savings, investment, and economic growth in Nigeria from 1980 to 2014. Using the Granger causality test and ECM, they confirmed a strong relationship among these factors. In Zimbabwe, Zinyurugwi and Mapfumo (2016) examined the impact of domestic savings on economic growth from 1980 to 2015 using the Engle-Granger residual-based cointegration test. Their findings suggested that savings did not significantly affect economic growth. Jagadeesh (2015) analyzed the role of savings in Botswana's economic growth from 1981 to 2012 using the ARDL model. The study supported the Harrod-Domar growth model, confirming that savings positively contributed to economic expansion.

Elias and Worku (2015) studied the causal relationship between economic growth and savings in Uganda and Ethiopia from 1981 to 2014 using the VEC model and Granger causality test. They found a significant positive relationship between domestic savings and economic growth and a unidirectional causality running from economic growth to savings. In South Africa, Getachew (2015) examined the causal link between domestic savings and economic growth from 1960 to 2013 using the Johansen cointegration test and Granger causality analysis. The study found that economic growth and savings influenced gross fixed capital formation.

Mndeme (2015) explored the interdependence between domestic investment, savings, and economic growth in Tanzania from 1972 to 2012. Employing a cointegration test and VECM,

the study concluded that savings and investment were uncorrelated in both the short and long run. However, investment had a positive long-term effect on GDP. Rotterdam (2015) investigated the relationship between savings and economic growth using the Granger causality test. The findings confirmed a causal link between gross domestic savings and real per capita economic growth. Additionally, a higher savings rate was found to positively impact per capita GDP growth. Nwanne (2014) examined how savings and investment influenced Nigeria's economic growth from 1981 to 2014 using OLS regression. The study found a long-term relationship among savings, investment, and economic growth. Changes in gross domestic savings negatively affected growth, whereas investment had a significant positive impact.

Osundina and Osundina (2014) analyzed the connection between savings, capital accumulation, and economic growth in Nigeria using OLS regression. Their findings indicated that while savings significantly influenced economic growth, investment had a weaker effect. Numerous studies have investigated the empirical link between savings and economic growth, including research by Alzghoul et al. (2023), Nwonye et al. (2022), Ayadi (2021), and Chuba and Ebhotemhen (2019). However, many Nigerian studies have primarily focused on private savings without encompassing total national savings. Additionally, existing research has largely overlooked the impact of savings held in various financial institutions, such as commercial, merchant, non-interest, mortgage, and microfinance banks. By considering these factors, this study seeks to provide policymakers with empirical insights to enhance savings through the formal financial sector, thereby contributing to the existing body of knowledge.

Research Design

This study adopts a longitudinal research design, which involves repeatedly analyzing the same variables over an extended period to assess any changes that may occur. Longitudinal research is a type of correlational study where researchers observe and collect data on variables over time without influencing them (Thomas, 2023).

Source of Data

The data for this study will be obtained from the Central Bank of Nigeria's (CBN) Statistical Bulletin and the World Development Indicators. Information on the working population will be sourced from the World Development Indicators of the World Bank, while data for other variables will be extracted from different editions of the CBN Statistical Bulletin. The study covers the period from 1981 to 2022.

Model Specification

The functional form of the model for objectives one and two is as follows:

$$RGDPG = SAV\_GDP, STDODC, WORKP, CRPS \quad . \quad . \quad . \quad (1)$$

Where:
RGDPG = Real GDP growth (annual %)

SAV_GDP = total savings as ratio of gross domestic product – GDP
$STDODC$ = savings and time deposits of other depository corporations
WORP = working age population, 18 years to 64 years
CRPS = credit to the private sector

Equation (1) is re-specified in autoregressive distributed lag (ARDL) form as follows:

$$\text{RGDPG} = \alpha_0 + \alpha_1 \text{RGDPG}_{t-1} + \alpha_2 SAV\_GDP + \alpha_3 STDODC + \alpha_4 \text{WORKP} + \alpha_5 CRPS + \sum_{j=1}^{p} \phi_j \text{RGDPG}_{t-j} + \sum_{s=0}^{q} \rho_s SAV\_GDP_{t-s} + \sum_{m=0}^{q} \delta_m STDODC_{t-m} + \sum_{z=0}^{q} \psi_z \text{WORKP}_{t-z} + \sum_{z=0}^{q} \vartheta_z CRPS_{t-z} + \mu_{1t} \quad \ldots (2)$$

In Equation (2), the short-run variables are represented by different terms, while the lagged terms correspond to the long-run variables. The error term is denoted as $\mu_1 t$, and the coefficients a_i (i = 1,2,3, …5) along with ϕ, ρ, δ, ψ, and ϑ represent the long-run and short-run relationships of the variables, respectively. The Akaike Information Criterion (AIC) is employed to determine the optimal lag length.

A major advantage of this model is its suitability for small sample sizes. Additionally, it provides unbiased estimates and t-values for both the short-run and long-run relationships. The model remains applicable even when the regressors are stationary at I(0), I(1), or a combination of both. If cointegration exists among the variables, it indicates that they adjust toward equilibrium, which is captured by an error correction model.

$$\Delta\text{RGDPG} = \alpha_0 + \sum_{j=1}^{p} \phi_j \text{RGDPG}_{t-j} + \sum_{s=0}^{q} \rho_s SAV\_GDP_{t-s} + \sum_{m=0}^{q} \delta_m STDODC_{t-m} + \sum_{z=0}^{q} \psi_z \text{WORKP}_{t-z} + \sum_{z=0}^{q} \vartheta_z CRPS_{t-z} + \gamma ECM1_{t-1} + \mu_{1t} \quad \ldots (3)$$

Where ECM1_{t-1} is the error correction term.

Definition of variables in the Model

Real GDP Growth (Annual %): This represents the yearly percentage increase in real gross domestic product (GDP). It is widely recognized in economic literature as a key measure of economic growth.

Total Savings as a Percentage of GDP (SAV_GDP): This refers to the combined domestic savings of households, private corporations, and the public sector, expressed as a percentage of GDP.

Savings and Time Deposits of Other Depository Corporations (STDODC): This includes the savings and time deposits held in various financial institutions such as commercial banks, merchant banks, non-interest banks, primary mortgage banks, and microfinance banks.

Working Population (WORKP): This represents individuals within the working-age bracket (18 to 64 years) who are actively employed in the labor market (Cohen, Cha, Terlizzi & Martinez, 2021).

Credit to the Private Sector (CRPS): This refers to the financial resources or capital made available to the private sector for investment and economic activities.

Estimation Technique

The regression equations for objectives one and two will be analyzed using the Ordinary Least Squares (OLS) estimator. In a linear model, OLS is used to estimate unknown parameters. It is considered the Best Linear Unbiased Estimator (BLUE) among linear estimators. When applying OLS, it is assumed that the variables have a linear relationship, the expected values E(âi) of each variable correspond to their true values (ai), and the estimators exhibit the lowest variance among all linear unbiased estimators.

Results and Discussion

Descriptive Statistics of the Variables

The estimated descriptive statistics of the variables in this study are reported in Table 4.1.

Table 1: Descriptive statistics

Variables	Obs.	Mean	Standard Deviation	Minimum value	Maximum value	P-value (Skewness)	P-value (Kurtosis)
RGDPG	42	3.0464	5.3194	-13.1278	15.3291	0.0227	0.0305
SAV_GDP	42	8.0493	3.4641	3.2917	14.9433	0.1161	0.0096
STDODC	42	4993.586	7696.035	6.1241	30240.02	0.0001	0.0182
WORP	42	18.0324	0.3283	17.4929	18.5859	0.9827	0.0028
CRPS	42	7341.734	10706.75	8.5700	38952.43	0.0007	0.1601

Source: Authors' Computation

The mean values of real GDP growth (annual %), total savings as a percentage of gross domestic product (GDP), and the working-age population (18 to 64 years) are relatively close to their respective standard deviations. This indicates that the data values for these variables are clustered around their mean values. Conversely, the mean values of savings and time deposits of other depository corporations, as well as credit to the private sector, are significantly larger than their corresponding standard deviations. The minimum values of all variables are below their respective means, while the maximum values exceed the mean values. This suggests that the data points for each variable are distributed both above and below the mean without significant outliers.

Regarding skewness, the probability values for real GDP growth (annual %), savings and time deposits of other depository corporations, and credit to the private sector are statistically significant at the 5% level. This leads to the rejection of the null hypothesis of normal distribution, indicating that the data is either right- or left-skewed and not symmetrically

distributed. However, total savings as a percentage of GDP and the working-age population have insignificant skewness probability values, leading to the acceptance of the null hypothesis of normal distribution at the 5% level. This implies that these two variables follow a normal distribution pattern.

For kurtosis, the probability values for credit to the private sector are insignificant, meaning that the null hypothesis of normal kurtosis is accepted at the 5% level. In contrast, real GDP growth (annual %), savings and time deposits of other depository corporations, total savings as a percentage of GDP, and the working-age population show statistically significant kurtosis values. This results in the rejection of the null hypothesis, indicating that these variables exhibit tail distributions similar to a normal distribution, whereas credit to the private sector deviates significantly from the normal distribution tail structure.

Unit Root Test

The unit root test is conducted to determine the stationarity of time series variables in a regression model. The Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests were employed to assess the stationarity of the time series data. The results of these tests are presented in Table 2.

Table 2: Augmented Dickey-Fuller and Phillips–Perron unit root test results

Variable	Augmented Dickey -Fuller Result		Philips–Perron Result		Lag order	~I(d)
	Level	1st Difference	Level	1st Difference		
RGDPG	-3.670*	-	-4.098*	-	2	I(0)
SAV_GDP	-1.554	-4.153*	-1.645	-4.929*	2	I(1)
LogSTDODC	-1.275	-4.260*	-1.105	-4.465*	2	I(1)
LogWORP	-3.778*	-	-6.179*	-	2	I(0)
LogCRPS	-1.103	-3.785*	-1.108	-4.590*	2	I(1)

Where * denotes significance at 5% and the rejection of the null hypothesis of the presence of unit root. The optimal lag length of 2 was chosen using Akaike's Final Prediction Error (FPE), and Akaike's information criteria. The ADF 5% critical value at levels is -3.544, while at 1st difference is -3.548. The Philips –Perron critical value at levels and 1 st difference are -3.536 and --3.540. A trend was included in both the Augmented Dickey -Fuller and Philips –Perron unit root test models estimated.

Source: Authors' Computation

The Augmented Dickey-Fuller (ADF) test at the 5% critical value indicates that the test statistics for real GDP growth (annual %) and the working-age population are greater than the critical value when tested at level. This implies that these variables are statistically significant, leading to the rejection of the null hypothesis of a unit root. Therefore, these variables are stationary at level, meaning they do not exhibit a unit root.

Conversely, the test statistics for savings and time deposits of other depository corporations, total savings as a percentage of gross domestic product, and credit to the private sector are lower than the 5% critical value at level. As a result, the null hypothesis of a unit root is accepted for these variables, indicating non-stationarity at level. To address this, the variables were differenced once, and the test was repeated at the first difference. At this stage, the test statistics for these variables exceeded the 5% critical value, leading to the rejection of the null hypothesis. This confirms that the variables become stationary at first difference and are integrated at order one, I(1).

The findings are further supported by the Phillips-Perron (PP) test, which also confirms that real GDP growth (annual %) and the working-age population are stationary at level, while the remaining variables achieve stationarity at first difference.

Impact of Total Savings and Savings & Time Deposits of Other Depository Corporations on Economic Growth

The first objective of this study is to assess the impact of total savings on economic growth, while the second objective focuses on examining the influence of savings and time deposits held by other depository corporations—such as commercial banks, merchant banks, non-interest banks, primary mortgage institutions, and microfinance banks—on economic growth.

Before proceeding with the analysis related to these objectives, the cointegration of the variables included in the models for both objectives was tested using the **Pesaran, Shin, and Smith (2001) ARDL Bounds Test**. This test is conducted to assess whether a long-run relationship exists among the variables by testing the null hypothesis that no cointegration exists. The results of the ARDL Bounds Test are presented in Table 3.

Table 3: Bounds test result for level form relationship (level effect)

Critical Values (0.1-0.01), F-statistic, Case 3								
	10%		5%		1%		p-value	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
F	2.681	3.886	3.250	4.610	4.604	6.314	0.001	0.007
t	-2.560	-3.669	-2.911	-4.077	-3.627	-4.903	0.000	0.002
F = 6.737 t = -5.750								

Source: Authors' computation

At a 5% significance level, the F-value exceeds the F-critical values for both order 0 and order 1. Additionally, the absolute t-value is greater than the t-critical values for both orders. This result is further validated by the significant p-values associated with the order 0 and order 1 variables. Since the test results indicate significance for both variable orders, the null hypothesis of no level relationship is rejected. This confirms that the variables in the model are cointegrated, indicating a long-run relationship. The error correction results are presented in Table 4.

Table 4: Error correction estimates of impacts of total savings, and savings and time deposits of other depository corporations on Economic Growth

The dependent variable is real GDP growth				
Variable	coefficients	Standard Errors	t-Statistics	P-value
Adjustment	-1.0150	0.1765	-5.75	0.000
Long-Run				
SAV_GDP	0.3258	0.1086	3.02	0.000
LogSTDODC	2.7939	1.1642	2.40	0.001
LogWORP	5.4001	4.1222	1.31	0.199
LogCRPS	2.3292	0.6830	3.41	0.000
Short-Run				
SAV_GDP	0.3307	0.3236	1.02	0.315
LogSTDODC	2.8360	1.2891	2.20	0.031
LogWORP	0.2210	0.1014	2.18	0.037
LogCRPS	2.3642	0.9649	2.45	0.000
Constant	4.6524	5.1897	0.90	0.377
R2		0.6219		
Adjusted R-Squared		0.5293		
F-statistics		5.64 (p = 0.0005)		
Durbin-Watson d-statistic (7, 38)		1.9165		
Breusch-Godfrey LM Chi-square Statistics		0.346 (p = 0.5564)		
Breusch–Pagan/Cook–Weisberg test (heteroskedasticity)		0.04 (p = 0.8357)		

Source: Authors' computation

The long-run coefficient for total savings as a percentage of GDP is 0.3258, with a t-value of 3.02. The significance of the t-value supports rejecting the null hypothesis, indicating that total savings as a percentage of GDP significantly influence real GDP growth over the long term. The corresponding p-value, which is below 0.05, further reinforces this conclusion. Specifically, an increase in total savings as a percentage of GDP results in an estimated 0.33% rise in real GDP growth in the long run. However, in the short run, the coefficient is 0.3307 with a t-value of 1.02, meaning the impact is statistically insignificant. Thus, while total savings as a percentage of GDP positively and significantly affect real GDP growth in the long run, the short-run effect is positive but not statistically significant.

For savings and time deposits of other depository corporations, the long-run coefficient is 2.7939, with a t-value of 2.40. Since the t-value is significant at the 5% level, the null hypothesis is rejected, confirming a significant impact on real GDP growth. This is further supported by a p-value of 0.001. A 1% increase in savings and time deposits of other depository corporations leads to a 2.79% increase in real GDP growth over the long run. In the short run, the coefficient is 2.8360 with a t-value of 2.20, indicating that the impact remains significant. A 1% rise in savings and time deposits of other depository corporations results in a 2.84% increase in real GDP growth in the short run. Therefore, savings and time deposits of other depository corporations positively and significantly impact real GDP growth in both the short and long run.

Regarding the working-age population, the long-run impact on real GDP growth is positive but statistically insignificant, as a 1% increase results in a 5.40% rise in real GDP growth. However, in the short run, the coefficient is both positive and significant, where a 1% increase in the working-age population leads to a 0.22% increase in real GDP growth.

Credit to the private sector has a long-run coefficient of 2.3292, with a t-value of 3.41, indicating a significant positive effect on real GDP growth. A 1% increase in credit to the private sector leads to a 2.33% rise in real GDP growth in the long run. The short-run results are consistent, with a 1% increase in credit to the private sector leading to a 2.36% increase in real GDP growth.

The coefficient of determination (R^2) is 0.6219, meaning that approximately 62.19% of variations in real GDP growth can be explained by the model's variables. The F-statistic of 5.64, with a probability value of 0.0005 (less than 0.05), confirms that the model's variables jointly have a significant impact on real GDP growth.

The Durbin-Watson statistic of 1.9165, which is close to 2, indicates no autocorrelation in the model. This is further confirmed by the Breusch-Godfrey LM test, where the test statistic of 0.346 and a probability value of 0.55644 indicate the absence of autocorrelation. Additionally, the heteroskedasticity test shows an insignificant coefficient at the 5% level, implying that the variables exhibit homogeneity with constant variance.

Summary, Conclusion, and Recommendations

Summary of Findings

The key findings of this study are as follows:

i. Regarding the first objective, the study established that total savings as a percentage of GDP had a positive and significant effect on real GDP growth in the long term. However, in the short term, while the impact remained positive, it was not statistically significant.
ii. For the second objective, the study found that savings and time deposits held by other depository corporations had a positive and significant influence on real GDP growth in both the long and short term.
iii. Additional findings revealed that the working-age population had a positive but statistically insignificant impact on real GDP growth in the long run, whereas in the short run, its impact was both positive and significant. Furthermore, credit extended to the private sector was shown to have a positive and significant effect on real GDP growth in both the short and long run.

Implications of the Findings

The findings related to the first objective indicate that in the long term, increased savings contribute significantly to economic growth by facilitating investment. Higher savings lead to greater investment and increased economic activity, resulting in long-term economic expansion. However, in the short term, most savings have yet to be allocated to productive investments, leading to an insignificant impact on economic growth. This highlights the importance of encouraging total savings to achieve sustained economic growth over time.

For the second objective, the findings suggest that savings and time deposits from depository corporations—including commercial, merchant, non-interest, primary mortgage, and microfinance banks—play a crucial role in economic growth in both the short and long term. This is expected, as these financial institutions provide loans to businesses and individuals, fostering investment and economic activity. As a result, their role in economic growth is evident in both time frames.

Other findings indicate that the working-age population significantly contributes to economic growth in the short run but not in the long run. A continuously expanding working-age population may lead to underemployment and other challenges, reducing its long-term impact on economic growth. This underscores the need to monitor and manage workforce growth carefully. Additionally, access to credit for the private sector is a critical driver of economic growth in both the short and long run, emphasizing the importance of ensuring adequate financial support for private enterprises.

Conclusion

This study examined the impact of national savings on Nigeria's economic growth. The findings confirm that national savings—including total savings and savings held by depository corporations such as commercial, merchant, non-interest, primary mortgage, and microfinance banks—play a vital role in driving economic growth. Encouraging national savings can significantly boost economic growth in both the short and long term. A large working-age population benefits economic growth in the short run, but an excessive workforce can lead to lower growth in the long term. Additionally, credit availability for the private sector remains a key determinant of economic growth in both the short and long term.

Policy Recommendations

The paper recommended that:

i. To achieve sustained economic growth in both the short and long run, policies should be designed to promote total savings. This will support the attainment of targeted economic growth over time.
ii. The Central Bank of Nigeria (CBN) should implement strategies to strengthen public confidence in depository institutions, including commercial, merchant, non-interest, primary mortgage, and microfinance banks. Additionally, regulatory policies should be put in place to support their growth and stability.
iii. Enhancing access to credit for the private sector is essential. This can be achieved by increasing budgetary provisions for private-sector financing and offering low or zero-interest loans for critical sectors of the economy.

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