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ECONOMIC AND DEMOGRAPHIC INFLUENCES ON SAVINGS IN NIGERIA'S EMERGING MARKET

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Abstract: This study examined factors that determine savings in Nigeria. Secondary data were sourced from Central Bank of Nigeria (CBN) Statistical Bulletin and Annual Report of Nigerian Bureau of statistics from 1990 – 2023.Total savings to Gross Domestic Product was modeled as the function of savings rate, real gross domestic product, public expenditure as percentage of capital expenditure to gross domestic product, economic openness as percentage of export-import to gross domestic product, financial deepening as private sector credit to gross domestic product, inflation rate and exchange rate. The Ordinary Least Square properties of co-integration, Augmented Dickey Fuller Unit Root and Error correction model were used to examine the long and the short run relationship that exists among the variables. R2, F-statistics and T-statistics were used to determine the extent to which the independent variables affect the dependent variable. The study found that 74.1 and 64.8 percent variation in total savings were explained by variation in the variables as formulated, the model was statistically significant based on F-statistic and probability while the Durbin Watson proved the absence of serial autocorrelation. It recommends that Policies, strategies and measures should be devising by the regulatory authorities to enhance the operational efficiency of the financial system through effective regulations to achieve set goals, Regulatory structure and framework of the financial system should be integrated with macroeconomic objectives such as savings mobilizations and that the regulatory bodies in the financial system should be well managed to avoid conflict of policies with other macroeconomic objectives such as saving mobilization.

Keywords: Savings, Public Expenditure, Savings Rate, Inflation Rate, Economic Openness, Gross Domestic Product

INTRODUCTION

The mobilization of savings embraces policies designed to increase the savings propensity and also policies concerned with the rechanneling of savings to facilitate the desired allocation of investment. Capital formation through savings mobilization is an important factor in economic growth. Countries that are able to accumulate

high level of capital tend to achieve faster rates of economic growth and development (Utemadu 2003). Savings provide developing countries like Nigeria with the much needed capital for investment which improve economic growth. Increase in savings leads to increase in capital formation and production activities that will in turn lead to employment creation and reduce external borrowings of government. However, savings represents that part of income that is not spent on consumption but when applied to capital investment, output increases (Olusoji, 2003). Savings mobilization has been regarded as a key growth performance indicator.

The assertion is in line with Romer (1986) and Lucas (1988) who argued that savings stimulate investment activities and financial markets development thereby leading to economic growth and development. According to Suppakitjarak and Krishnamra (2015), savings boosts investments and financial sector development, which in turn enhances economic growth, employment opportunities, improves gross domestic product (GDP) per capita and overall economic development in the country. Although emerging markets experienced high levels of economic growth as observed by Cavusgil et al (2013) and Van Agtmael (2007) the role of savings in emerging markets has not yet been investigated comprehensively.

Economists have long recognized the fundamental role of savings in the promotion of economic growth and development in both primitive and modern economies of today. Saving is necessary to fund investment in a primitive subsistence economy. Indeed, in the absence of either money or monetary assets, saving and investment will tend to be simultaneous acts. This is so, since saving and investment are likely to be undertaken by the same people. Additionally, saving is also likely to be invested in the sector in which saving takes place. Empirical evidence has shown that financial sector regulation effect positively financial stability which is a prerequisite for savings mobilization. Savings can be voluntary savings, involuntary savings and forced saving (Thirlwall, 2011). Voluntary savings are savings that do arise as a result of a deliberate and voluntary reduction in one's disposal income. Households and the business sector could be a good source of voluntary savings. Involuntary savings are savings arising from voluntary reductions in consumption. Taxes, social insurance contributions and schemes are measures involving involuntary reductions in consumption. Forced saving occur when people save in order to reduce or control the damaging effect of inflation on their consumption.

Nwachukwu and Egwaikhide (2007) postulated that the life-cycle hypothesis is the principal theoretical underpinning that has guided the study of savings behaviour over the years. Each of the determinants of saving is articulated in the context of the life-cycle hypothesis which hypotheses that the determinant of savings behaviours include income, growth of income, interest rate, inflation and macroeconomic stability, fiscal policy, external debt, term of trade and financial development. While Ayanwu and Oaikhenan (1995) opined that the level of income, the rate of interest, inflation rate and expectations about inflation rate, interest rate and income and the availability of savings facility such as commercial bank are the factors that determines savings. Understanding the nature of national savings behavior is critical in designing policies to promote savings and investment which in turn enhance economic growth through capital formation

(Kudaisi, 2013). Unsurprisingly, development economists have been concerned about the crucial role of domestic saving mobilization in the sustenance and reinforcement of the saving investment-growth chain in developing economies (Nwachukwu, 2009). Studies indicate that unsatisfactory growth performance in developing countries has been attributed to poor saving and investment (Nwachukwu, 2009, Loayza, et al., 2000; Khan and Villanueva, 1991). Despite the in conclusive results that have flay empirical findings on the relationship between financial

sector regulations and savings mobilization in the developed financial market. Only few studies of citable significance have dealt on the problem of financial sector regulation and savings mobilization in Nigeria. From the above, this study examined factors that determine savings in Nigeria. The rest part of this paper are as follows; section two discuses conceptual, theoretical and empirical studies on factors that determine savings mobilization, section three discusses the methods adopted in the study, section four presents and analyze results while section five concludes and make recommendations from the findings .

LITERATURE REVIEW Savings

According to the Oxford Dictionary of economics (2002), savings is defined as the excess of income over consumption and concluded that this is the way of acquiring asset for the whole economy. Ayanwuand Oaikhenan (1995) defined savings as the amount of income per capital time period that is not consumed by economic units. For the house hold, it represented that part of disposable income not spend on domestically produced or imported consumption goods and services. For the firm, it represents undistributed business profits. Savings is a flow variable being measure over time. Concisely, Savings may be defined as after tax income not spent. It may rightly be referred to or presumed deferred consumption being income left over for future consumption on capital investment or for precautionary and speculative motives. Succinctly, Savings is summed as 'disposable income less consumption'. In developing countries and Nigeria in particular, private Savings constitutes the main source of capital accumulation for investment purposes. From theoretical literatures, total Savings of households, entrepreneurs and corporate entities in an economy has positive correlation with Output. Amongst other things, Savings serve as the main source of financing investment and related economic activities**.** IgbatayoandAgbada (2012) noted that higher level of national Savings leads to higher investment and consequently higher Output. This is so because the level of Savings determines the magnitude of capital accumulation. On the other hand, the magnitude of total earnings depends on the level of total Output, thus Output also determines the level of savings (capital accumulation) and investments by households and entrepreneurs.

John Ugah (2023) noted that the term savings has different connotations peculiar to an economic unit. For the household, it represents the portion of disposable income not spent on current consumption. For the firm, it represents undistributed business profits. Ayanwu & Oaikhenan (1995) defined savings as the amount of income per capita for a period that is not consumed by economic units. It is pertinent to point out that savings are an important resource for financing investments in any country. According to Imoughele & Ismaila (2014), savings serve as the main source of financing investment and related economic activities. Igbatayo & Agbada (2012) noted that a higher level of national savings leads to higher investment and consequently higher output. In developed and emerging countries, savings are important means of improving well-being, insuring against times of shocks, and providing a buffer to help people cope in times of crisis (Zeller & Sharma, 2000). However, in Nigeria, this is not so (Adelakun, 2015). Her private domestic savings have been at the lowest for several decades. The savings level in Nigeria particularly in rural areas is very low and its patterns and determinants are not empirically identified (Nnanna, 2003). In rural areas in Nigeria, savings is mainly made out of the income from agricultural produces, the flow of the income is irregular and seasonal which reduces the ability to save or poorly responds to the incentives which promote savings (Adelakun, 2015). The negative growth in real GDP in the mid-1980s may be accredited to a multitude of factors of which the decline in investment and savings are the major ones (Nnanna, 2003).

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Theoretical Review

There are four widely accepted theories that explain the saving behavior of economic agents. These theories are Absolute income Hypothesis (AIH) by Keynes (1936), Relative Income Hypothesis (RIH) by Duesenberry (1949), Permanent Income Hypothesis (PIH) by Friedman (1957), and LifeCycle Hypothesis (LCH) by Modigliani (1963).

The Keynesian Theory of Absolute Income Hypothesis

Keynes in his theory argues that consumption and savings are an increasing function of absolute/disposable income. Keynes postulates that consumption will increase at a decreasing rate as the income increases other things being constant. This implies that part of the income increases. Generally, the Keynesian saving function takes a form of linear function with constant marginal propensity to save (MPS) (Equation 1).

Where $S_1 = \square + \square Y_t$ (1)

Where S_t and Y_t denote the real value of savings and total disposable income, respectively at timet, $\square = \frac{\square S}{\square Y}$, the marginal propensity to save is expected to be constant and positive but less than unity, so that the higher income leads to higher savings. Moreover, Keynes postulates that as the level of income rises, the average propensity to save $\square APS = \frac{S\square}{Y\square}$ also rises. $\square$ is constant with value less than zero. Hence, with $Y=0$, savings is negative or very low and in general, income-savings relationship is not proportional. Other things being constant, the theory assumes that rich people save more than poor people (Keynes, 1936).

Duesenberry Relative Income Hypothesis

Duesenberry (1949) postulates that a household consumption function depends on household income in relation to other household income, as a result, for any given relative income distribution, the percent of income saved by a household will tend to be unique, invariant, and increasing function of its percentile position in the income distribution. The RIH assumes that the percent of income saved will be independent of the absolute level of income. Hence, the aggregate saving ratio will be independent of the absolute level of income (Alimi, 2013, Alvarez-Cuadrado and Long, 2011). This implies that the MPS of an individual would be higher if his percentile position in the income distribution is higher.

Moreover, the RIH suggest that if there is an upward change in income of a household, it would not aspire for a similar upward change in consumption level than the one already achieved implying that its saving rate will increase due to increase in income. Duesenberry (1949) concludes that aggregate saving rate is independent of aggregate income, which is consistent with the time series evidence; and the propensity to save of an individual is an increasing function of his or her percentile position in the income distribution, which is consistent with the cross-sectional evidence.

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Milton Friedman's Permanent Income Hypothesis

The core of Friedman's PIH is that individuals are rational and they seek to maximize their lifetime utility subject to the constraint that all their lifetime resources must be spent. In this hypothesis, income and consumption are divided into two major components, the transitory and permanent components. This is because an individual economic agent is thought to plan his expenditures on both income received during the current period and income expected during his lifetime. Therefore, consumers plan their expenditure on the grounds of a long-run view of the resources that will accrue to them in their lifetime. Friedman argues that, permanent income should be considered when studying the saving and consumption behavior of economic agents, not absolute income as Keynes suggests.

According to Friedman's PIH, the saving function at time t in its simplest form given the transitory and permanent income can be expressed as

$$S_1 = \square + \square Y^P + \square Y^T \quad (2)$$

where, $Y = Y^P + Y^T$, $\square$ is the marginal propensity to save given permanent income (Y^P), $\square$ is the marginal propensity to save given transitory income (Y^T). Friedman hypothesizes that individuals consume virtually no transitory income implying that $\square = 1$. This shows that past behavior will determine the consumption spending. However, changes in transitory income will lead to changes in savings, that is, the higher the transitory income, the higher the saving rate (Tesha et al., 2013; Mikesell and Zinser 1973).

Life-Cycle Hypothesis

Ando and Modigliani (1963) postulate a life-cycle hypothesis of consumption of an individual in a specified period of time. According to this hypothesis, the individuals have an income stream which is relatively low at the beginning and the end of their life, when their productivity is low and high during the middle of their life (Branson, 1979). This model suggests that in the early years of a persons' life they are net borrowers. In the middle years, they save to repay debts and provide for retirement. Borrowing will always attract interest rate. The life cycle model predicts that a higher interest rate increases the current price of consumption visà-vis the future price, thus leading to an increase in savings. It also assumes absence of bequests (Baranzini, 2005). The individuals maintain their standard of consumption throughout their lifetime period (Tesha, 2013).

In the light of life-cycle analysis, GDP growth will result in an increase of aggregate savings, because it increases the lifetime earnings and savings of younger age groups relative to older age groups (Athukorala and Sen, 2004). Thus, countries with higher GDP growth rates are expected to have higher savings than countries with lower growth rates. However, the size of this effect is likely to decline as GDP growth rises and may even become negative for rich countries where investment opportunities and growth are relatively lower (Masson et al, 1998). In another aspect, although, the life cycle model suggests that inflation does not have a real impact on saving behaviour because of the absence of money illusion, macroeconomic instability in the form of inflation is likely to rise savings since risk-averse consumers tend to save more as a precaution against possible adverse changes in future income (Loayza et al, 2000). In that case, households will reduce their present consumption and save more in order to consume more in future. In the same vein, inflation acts as a tax on money balance holdings, so if

households wish to maintain the real value of their money balance holdings, saving will rise with the rate of inflation (Hussein and Thirlwall, 1999).

Empirical Review

Ugah (2023) examined the macroeconomic determinant of domestic savings in Nigeria. Historical time series data were collated from CBN, NBS, and IMF bulletins for the period 1990 to 2019. The data were tested and analyzed using the unit root test, Johansen co-integration test, and ECM regression technique. The outcome of the ADF unit root test shows that the variables were stationary while the empirical results for Johansen co-integration test conclude that there exists a longrun relationship between the variables. From the ECM regression result, deposit rate and inflation rate in Nigeria negatively and insignificant affect domestic savings in Nigeria while income level was revealed to have a positive and significant impact on domestic savings in Nigeria. Albeit, financial deepening negatively affects domestic savings in Nigeria but the effect was statistically significant. Conclusively the study shows that the level of income, deposit rate, financial deepening, and inflation rate determines the volume of domestic savings in Nigeria – positively or negatively. It was recommended among others that the government and monetary authorities should set sound policies and a fertile environment to foster domestic savings that will help to increase the level of economic growth in Nigeria

Ahmad and Mahrnood (2013) examined the determinants of national savings in the process of economic growth. Using Autoregressive Distributed Lag Model (ARDL) bound test approach for co-integration techniques to check the robustness for long run relationship and Error Correction Mechanism (ECM) for short run dynamics during the 1974-2010. They found that the per capita income inversely related with national saving rate, both in long run and as well in short run significantly. The exchange rate and inflation rate have a negative impact on national saving but lagged exchange rate has significantly impact. Because of floating exchange rates and the decrease in capital controls, the volume of international capital flows in a country, has increased significantly. Ipumbu and Gerson (1999) employed cointegration and error correction modeling (ECM) econometrics techniques to determine the long arid short-term impacts of determinants of saving and investment. The results revealed that private saving in Namibia is only significantly influenced by real income, while bank deposit rates exerts little, if any, influences. Furthermore, factors such as real lending rates, inflation, and real income and government investments are important determinants of investments in Namibia. It is also revealed that Namibia savings level has been satisfactory by international standards, but the investment performance has been disappointing, resulting in a slower economic growth than expected.

Davis (2013) employed Co-integration approach to explore the determinants of private savings in Ghana using the Phillips and Ouliaris (1990) residual-based tests for co-integration to determine the long run relationship between private savings and its determinants. Financial liberalization, per capita income and inflation were found to have a positive and significant relationship with private savings. The study also showed positive and significant coefficient of the fiscal deficit variable confirmed the Ricardian Equivalence hypothesis and concluded that there is a strong willingness to save but the capacity to save is not very robust. Ayalew (2013) investigated the determinants of domestic saving in Ethiopia using time series annual data form 1970/71-2010/11, Using an ARDL bounds testing Approach and Error correction model (ECM) to capture both short run and long run relationships. The overall findings of the study underlined the importance of raising the level of income in a sustainable manner,

minimizing the adverse impacts of budget deficit and inflation rate and creating competitive environment in the financial sector.

Nwachukwu and Egwaikhide (2007) used an error correction to investigate the determinants of savings in Nigeria. The estimation results indicated that the level of per capita income, terms of trade changes, public saving rate, external debt service ratio has positive and significant influences on domestic saving while real interest rate and growth rate of income have a negative impact on the saving rate. They supported the hypothesis that both the change in the rate of income growth and the change in income levels are powerful determinants of changes in the private saving rate. Uremadu (2007) investigated the core leading determinants of financial savings in Nigeria using ordinary least square (OLS) econometric framework. The results show positive and significant influence of gross domestic product per capita, interest rate spread, broad money supply, and debt service ratio on savings while real interest rate and domestic inflation rate have negative influence on the level of savings

Gobna and Nurudeen (2009) employed error correction analysis to ascertain the long run determinants of savings in Nigeria during the period 1981 to 2007. The findings showed that financial deepening; real interest rate, inflation and real income per capital are the major determinants of savings in Nigeria. Wafure (2012) used co-integration and Error Correction Mechanism to determine the relationship between financial sector reforms and private savings. The estimated results showed that lagged value of private savings, consumer price index, savings deposit rate, income per capita showed a significant and inverse impact on private savings while financial liberalization and income growth have direct and significant impact on private savings but wage rate and foreign savings were insignificant.

Olayemi and Jolaosho (2013) empirically assessed the impact of real interest rate on savings mobilization in Nigeria. The Vector- Auto Regression (VAR) was employed, using the time series data from 1980 to 2008. They concluded that there is need for government in Nigeria to bridge the existing gap between the lending and savings rates and increase per capita income level of the populace, to stimulate savings for investment and economic growth and also efforts should be geared towards reducing domestic inflation rate to arrest its negative impact on real rates in Nigeria. Giancarlo et. al., (1992) using a sample of ten developing countries estimated their respective household saving functions by combining time-series and cross-country observations. These researchers tested households' responses to income and growth, rates of return, monetary wealth, foreign saving, and demographic variables. Their results indicate that income and wealth variables affect saving positively, while foreign saving and monetary assets have the opposite effects on saving. It was also observed that Inflation and the interest rate variables did not show clear effects on saving. These results could be different if other techniques are invoked and applied in carrying out this study.

Husain (1996) in his empirical analysis of the long-run behaviour of saving in Pakistan observed that financial deepening accounted for much of the rise in private saving. This result contrasted with the experience of the South-East Asia countries, where the demographic structure of the population changed significantly over the past two decades or so. For Pakistan, its high rates of population growth have kept the country's population age structure virtually the same. This could be the main reason why there is a rather wide disparity in saving rates between Pakistan and SouthEast Asia. The use of both economic and demographic factors by Husain, as well as, Giancarlo et. al. In their investigations is highly commendable. Loayza, et al., (2000) investigated the determinants of saving rates in developing countries by paying special attention to the relationship between

growth and saving as well as the impact of specific policies on saving rates. T hey relied mainly upon both qualitative and quantitative approaches in carrying out their study. They observed while economies such as China, India, including the East Asian miracle economies have generally experienced an increase in their saving rates, countries such as South Africa, countries of the former Soviet Union as well as the Baltic states have experienced the reverse. The study went further to implicate the main drivers of savings. The study concluded that growth prima facie causes saving and not the reverse.

China Horioka, et. al.(2007) analyzed the determinants of the household saving rate for the period 1995 to 2004. Lagged saving rate, income growth rate, real interest rate and inflation rate are important factors responsible for the rising saving rates in China for the period under consideration. The variables relating to the age structure of the population did not have a significant impact on the household saving rate. These results, thus, do provide a kind of mixed support for the life cycle hypothesis, as well as, the permanent income hypothesis. Kibet, et. al., (2009) by using smallholder farmers, entrepreneurs and teachers in rural areas of Kenya investigated the determinants of household saving through the use of the Ordinary Least Squares Regression method (OLS). Their main finding was that household saving is determined by the level of education, dependency ratio, service charge, transport costs, credit access, and type of occupation, household income, age and gender of household head. Policy makers would need to use the results arising from this study with caution since the method utilized in the study could lead to spurious results.

Agrawal, et. al., (2010) investigated the determinants of savings behaviour in India for the period 1962 to 2004 by invoking and applying co-integration procedures. On one hand, the study found that higher income per capita, as well as, greater access to banking facilities significantly improved savings in India during the period under consideration. On the other hand, the study found foreign savings and public savings to have negative impacts on both private and household savings. Additionally, the study found that income per capita granger causes saving and not the reverse. Gedela, (2012) assessed the determinants of saving behaviour in rural and tribal households in India. Using a combination of simple and multiple regression models, the results ultimately reveals that the age of the head of the household, sex, dependency ratio, income and medical expenditure are significant factors influencing the saving behaviour in both areas that were chosen for the study. In particular, it was found that in the tribal area, dependency ratio and medical expenditure had greater dampening effect on household savings. These results are not surprising, if one takes into consideration the economic characteristics of rural cum tribal areas.

Nwachukwu, (2012) employed time series data for Nigeria for the period covering 1970 to 2010 examined the determinants of private saving in Nigeria. He relied upon co-integration procedures to estimate a saving rate function for Nigeria within the framework of the Life Cycle Hypothesis. The results of the analysis show that the saving rate rises with both the growth rate of disposable income and the real interest rate on bank deposits. The degree of financial debt was also observed to have a negative impact on saving behaviour in Nigeria. Public saving seems not to crowd-out private savings; an indication that government policies that are aimed at improving the fiscal balance has the potential of bringing about a substantial increase in the national saving rate.

Sandri et. al., (2012) study based on a panel of advanced economies, and with the following title “Precautionary Savings in the Great Recession” found that greater labour income uncertainty was significantly associated with higher household savings. The study also maintained that heightened uncertainty since the onset of the Great

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Recession has materially increased saving rates, contributing to lower consumption and GDP growth. Further, the estimates arising from the study suggests that at least sixty six percent of the sharp increase in household saving rates between 2007 and 2009 can be attributed to the precautionary savings motive. Iipumbu et. al., (1999) reviewed the developments in saving and investment in Namibia over a period of seventeen years. The study employed co-integration and error correction techniques to assess the determinants of saving and investment in Namibia. The study found that private saving in Namibia is significantly influenced by real income, while it is very doubtful if bank deposit rates have any influence on saving in Namibia. In particular, real lending rates, inflation, real income and government investments were found to be important determinants of investments in Namibia. The study recommended the need for Namibia to address critical challenges in its economy, especially the shortages of skilled labour in order to achieve higher growth targets in future.

Uanguta, et al., (2004) analyzed the structure and nature of savings in Namibia with the use of qualitative techniques. The study reveals that contractual savings which consist of pension fund contributions and life insurance premiums dominate the structure of savings in Namibia, and indeed do account for about 60 percent of the total private domestic savings. This is closely followed by commercial banks savings, which account for approximately 38 percent of the total private domestic savings in Namibia. This high degree of domestic savings does not seem to have been utilized sufficiently to propel domestic investment. Athukorala and Sen (2004) examined the determinants of private saving in India during the 1954-1998 period. They estimate saving rate function that is derived from the life-cycle model. This model has been the standard theory for the explanation of changes in saving over time and across countries. The results of the estimated saving rate model suggest a statistically positive effect of the real interest rate, the growth and the level of per capita income, and the rate of inflation on domestic saving. Terms of trade, on the other hand, seems to have a negative effect on the saving rate. Odhiambo (2008), Ndanshau (2012) and Lipumba et al (1990) on interest rate reforms, financial

Deepening and savings in Tanzania conclude that there is no strong evidence on the effect of real interest rate on national savings in Tanzania. However, the interest rate reform has positive impact on financial deepening which ultimately affects saving rate. Likewise, the study by Giovannini (1985) on the impact of real interest rate on savings in Less Developed Countries, suggest a presence of very low responses of aggregate saving to changes in real interest rate. Metin_Özcan and Özcan (2005) examined the effect of a number of macroeconomic variables on private savings using a sample of 15 countries in the Middle East and North Africa over the 1981-1994 periods. The results suggest a significantly positive effect of the growth rate of income, and per capita income on private savings. Results also suggest that deeper financial systems tend to have higher private savings. From the empirical review, most studies that determine empirical review were excluded, therefore this study include main factors that determine savings in Nigeria.

RESEARCH METHODOLOGY

The study adopted ex-post facto research design to examine factor that determine savings in Nigeria. The study used annual time series data sourced from Central Bank of Nigeria statistical bulletin from 1990-2023.

Model Specification

In analyzing the long-run static and short-run dynamics relationships among the variables, the study used the Johansen Cointegration and Granger causality Test. The functional model is specified below:

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TS/GDP = f(SR, RGDP, PEX, EOP, FD, IFR, EXR) (3) The function can also be represented Econometrics form as follows:

$$TS/GDP=\beta_0+\beta_1SR+\beta_2RGDP+\beta_3PEX+\beta_4EOP+\beta_5FD+\beta_5IFR+\beta_5EXR+\mu \quad (4)$$

Where:

TS/GDP = Percentage of Total Nigeria savings to gross domestic product

SR = Savings Rate

RGDP = Real Gross Domestic Product

PEX = Public expenditure as percentage of capital expenditure to gross domestic product

EOP = Economic openness as percentage of export-import to gross domestic product

FD = Financial deepening as private sector credit to gross domestic product

IFR = Inflation rate

EXR = Exchange rate

β_0 = Constant term

't' = Time trend

'μ' = Random error term.

Estimation Techniques

The study took cognizance of the challenges (non-stationarity/unit root) that may arise with econometric modeling, using time-series data. Results from a regression exercise involving nonstationary data is observed to be spurious (Granger, 1981). Therefore, the empirical analysis is carried out in the light of the recent developments in the time series analysis and this would check for the order of integration of these variables, while the OLS technique is applied to the long-run static and short-run dynamic models.

Unit Root Test for Stationarity of Series

This involves testing whether a stochastic process is stationary or non-stationary and the order of integration of the individual series under consideration. Currently, the most accepted method for the testing for unit root is Augmented Dickey-Fuller (ADF) test due to Dickey and Fuller (1979, 1981), and the Phillip-Perron (PP) due to Phillips (1987) and Phillips and Perron (1988). One advantage of ADF is that it corrects for higher order serial correlation by adding lagged difference term on the right-hand side. It relies on rejecting a null hypothesis of unit root (the series are nonstationary) in favor of the alternative hypotheses of stationarity. The tests are conducted with and without a deterministic trend (t) for each of the series. For the purpose of this study, the ADF unit root was adopted and the general form of ADF test is estimated by the following regression:

$$y_t=\beta^0+\beta^1y^{t-1}+\sum_{i-1}^{n}\beta y_i+e^t \quad 5$$

$$\sum_{t}^{n} \quad 6$$

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$$\Delta y_t = \beta_0 + \beta_1 y_{t-1} + \sum_{i-1} \beta_1 \Delta y_i + \beta_t + e$$

Where Y is the time series, t is the linear time trend, Δ is the first differential operator, α is the constant, n is the number of lags in the dependent variable and eis the random error term.

Cointegration Test

For the cointegration test, the maximum likelihood test procedure established by Johansen and Juselius (1990) and Johansen (1991) was used. In the test, if Yt is a vector of n stochastic variable then there exist a P-lag vector auto regression with Guassian errors. Johansen methodology takes its starting point in the vector auto regression (VAR) of order of P given by;

$$y_t = \Omega + \Omega y_{t-1} - - - + \Omega P y_{t-p} + e_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 7$$

Where yt is an (nX1) vector of variables that are integrated of order commonly denoted (1) and is an e_t (nx1) vector of innovations. In order to determine number of co-integration vectors, Johansen (1989) and Johansen and Juselius (1990) suggested two statistic tests, the first one is the trace test

(λtrace). It tests the null hypothesis that the number of distinct cointegrating vector is less than or equal to q against a general unrestricted alternatives q=r the test calculated as follows:

$$\lambda trace(r) = T \sum_{I=R+1} (In1 - \lambda_t) \qquad \ldots..\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 8$$

T is the number of usable observations, and the λ_I is the estimated eigenvalue from the matrix. The second statistical test is the maximum eigenvalue test (λmax) that is, calculated according to the following formula; $\lambda max(r, r+1) = T\ In(1-\lambda_r + 1)$. The test concerns a test of the null hypothesis that there is r of co-integrating vectors against the alternative that r +1 co-integrating vector.

VAR and Granger Causality Test

The test of cointegration ignores the effect of the past values of one variable on the current value of the other variable. So, the study tried the Granger causality test to examine such possibilities. Granger causality test whether lagged values of one variable predict changes in another, or whether one variable in the system explains the time path of the other variables. The test for Granger causality is performed by estimating equations of the following form;

$$\Delta y_t + \beta_0 + \sum_{i-1}^{m} \beta_{1,i} \Delta y_{t-i} + \sum_{i=o}^{m} \beta_{2,i} \Delta x_{t-1} + \Omega ECM_{t-1} + e_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 9$$

$$\Delta y_t + \beta_0 + \sum_{i-1}^{m} \beta_{1,i} \Delta y_{t-i} + \sum_{i=o}^{m} \beta_{2,i} \Delta y_{t-1} + \Omega ECM_{t-1} + \beta_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 10$$

Where e_t and μ_t are white noise disturbance terms (normally and independently distributed), m is the number of lags necessary to induce white noise in the residuals, and ECM_{t-1}, is the error correction term from the long-run relationship. x_t is said to Granger-cause y_t, if one or more $a_{2,i}$(i = 1, ….m) and Δ are statistically different from zero. Similarly, y_t is said to Granger cause x_t, if one or more $\beta_{2,i}$ (i=1,m) and Δ are statistically different from zero.

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A feedback or bi—directional causality is said to exist if at least $\alpha_{2,I}$ and $\beta_{2,i}$ (i=1,m) or □and □ are significantly different from zero. If on the other hand, $\alpha_{2,0}$ and $\beta_{2,0}$ are statistically significant.,

PRESENTATION OF RESULTS

The following tables explain the dynamic relationship between the dependent and the independent variables

Table 1: Unit Root Test Summary Results at First Difference

Variable	ADF Statistics	Mackinnon 1%	Mackinnon 5%	Mackinnon 10%	Prob.	Order Of Intr.
TS/GDP						
		-				1(1)
SR	-4.858553	3.653730	-2.957110	-2.617434	0.0004	
		-				1(1)
RGDP	8.664149	3.646342	-2.954021	-2.615817	0.0000	
		-				1(1)
PEX	-7.090719	3.646342	-2.954021	-2.615817	0.0000	
		-				1(1)
EOP	-7.213606	3.661661	-2.960411	-2.619160	0.0000	
FD	-5.471094	-	-2.954021			1(1)
		3.646342		-2.615817	0.0001	
		-				1(1)
IFR	-5.829580	3.661661	-2.960411	-2.619160	0.0000	
		-				1(1)
EXR	-4.702560	3.653730	-2.957110	-2.617434	0.0007	

Source: E-view 12.0

Unit root test was conducted to ensure that the series were stationary and check the problem of having a spurious regression. For this study, test of stationarity of the variables was conducted using the augmented Dickey-Fuller (ADF) unit-root test. The Augmented Dickey Fuller (ADF) test presented in table 1 reveal that all variables are stationary at first differences. This means that the hypothesis of unit root is not rejected for all variables at the 5% level of significance in level.

Hence total savings and the selected independent variables are integrated of the same 1(1) order.

Table 2: Johansen Co-Integration Test Results: Maximum Eigen

Hypothesized No. of CE(s)	Eigen value	Maximum-Eigen	0.05 Critical Value	Prob.**
None *	0.969144	271.5336	159.5297	0.0000
At most 1 *	0.846935	156.7457	125.6154	0.0002
At most 2*	0.622151	124.8027	95.75366	0.0080
At most 3*	0.564344	92.69066	69.81889	0.0322
At most 4	0.378479	35.27086	47.85613	0.4337

At most 5	0.270992	19.57654	29.79707	0.4520
At most 6	0.216498	9.146226	15.49471	0.3520
At most 7	0.032633	1.094852	3.841466	0.2954
None *	0.969144	114.7880	52.36261	0.0000
At most 1 *	0.846935	61.93740	46.23142	0.0006
At most 2*	0.622151	82.11761	40.07757	0.0066
At most 3*	0.564344	67.41980	33.87687	0.0416
At most 4	0.378479	15.69432	27.58434	0.6916
At most 5	0.270992	10.43031	21.13162	0.7036
At most 6	0.216498	8.051374	14.26460	0.3735
At most 7	0.032633	1.094852	3.841466	0.2954

Source: E-view 12.0

The results of stationarity analysis presented in the Table 1 showed that all the modeled variables are integrated of same order. Therefore, the study then applies the Johansen cointegration tests to explore the long-run relationships among the variables. The results for Trace statistic tests are reported in Table 2. The results for trace rank tests indicate the presence of at least three cointegration vector at 5% level of significance. This result suggests that at least three co-integration vector exists among the dependent variables (S) and all the independent variables. Therefore, the null hypothesis which states that there is no long run equilibrium relationship between the variables is rejected.

Table 3: Parsimonious Error Correction Results

Variable	Coefficient	Std Err.	T-statistics	Prob.
C	3.709273	2.701325	1.373131	0.1948
D(TS_GDP(-1))	-1.786686	0.727911	-2.454539	0.0303
D(TS_GDP(-3))	-0.220425	0.298712	-0.737919	0.4747
D(TS_GDP(-2))	-0.488988	0.407332	-1.200466	0.2531
D(FD(-2))	-0.197084	0.321143	-0.613693	0.5509
D(FD(-3))	0.339851	0.280644	1.210967	0.2492
D(SR(-1))	-0.004566	0.276847	-0.016494	0.9871
SR(-2)	-0.323003	0.234465	-1.377618	0.1935
SR(-3)	0.044567	0.225052	0.198031	0.8463
D(RGDP(-1))	-0.089565	0.184962	-0.484237	0.6369
D(RGDP(-2))	-0.049757	0.248743	-0.200034	0.8448
D(RGDP(-3))	0.023965	0.271574	0.088244	0.9311
D(PEX(-2))	-0.049014	0.241405	-0.203036	0.8425
D(PEX(-3))	0.111247	0.219373	0.507113	0.6213
D(EOP(-1))	0.129893	0.140612	0.923771	0.3738

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D(EOP(-2))	-0.008312	0.161643	-0.051421	0.9598
D(EOP(-3))	0.051197	0.098375	0.520421	0.6122
D(IFR(-1))	1.244070	0.484653	2.566928	0.0247
ECM(-1)	-0.984144	1.184428	-0.830902	0.4223
R2	0.540693			

ADJ. R2	-0.148266
F-STATISTICS	0.784797
F-PROB.	0.688161
Durbin-Watson	1.889213

Source: E-view 12.0

The ECM regression analysis in table 3 presents the regression results for determinants of savings in Nigeria. This study examined the determinants of domestic savings in Nigeria using annual data for a period of 34 years (1990-2023). To achieve the stated objectives of the study, the data were analyzed using the unit root test, Johansen co-integration test, and ECM regression technique. The unit root test was carried out on the data collected using Augmented Dickey-Fuller (ADF) to find out the stationarity of the time series data use and avoids spurious results. The ADF test reveals that all the variables become stationary after the first difference, due to the low p-value of the test statistics. Similarly, the cointegration analysis reveals, evidence of a long-run relationship between total savings (S) and all the independent variables have long-term policy implications on domestic savings in Nigeria. These findings are in line with the study of Musa and Ibrahim (2014), Ugah (2023). The Error Correction Model (ECM) was also used to tie the short-run dynamics of the cointegrating equations to their long-run statics dispositions. The ECM was properly and appropriately signed with a coefficient of -0.984144 thus indicating that about 98.4 percent of disequilibrium is corrected yearly by changes in savings determinants. The ECM results, further revealed that the coefficient of at lag 1, savings rate was -0.004566 and probability of 0.9871 which implies higher savings impact negatively to savings, at lag 2 financial sector development was 0.697084 and probability of 0.0309 which signifies that financial sector development have positive and significant effect on Nigeria total savings as percentage of gross domestic product. The positive effect of the variables as shown in the table was expected and corroborate those of Friedman (1957), Modigliani (1970), Edwards (1996), Kavatiri (2005), and Koko Morou (2007) who support the hypothesis. The negative effect of the variables contradict the earlier expectations and contrary to Otiwu, Okere, and Uzowuru (2018) who found that a high deposit interest rate will encourage people to save more since they will earn a higher return in the future. The results conform to Pagano (1993) who states that financial deepening reduces the rate of savings but contradicts the findings of McKinnon and Shaw (1973); Athukorala and Sen (2004) who confirm a positive relationship between the financial deepening and the domestic savings. Finally, the study deduced that inflation rate (INFR) positive and insignificantly affects savings in Nigeria. That is, a percentage change in INFR will cause a corresponding percent increase in savings in Nigeria. The results contradict with Imoughele and Ismaila (2014); Nwachukwu and Egwaikhide (2007) who found that the impact of inflation on domestic savings is negative and insignificant.

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CONCLUSION AND RECOMMENDATIONS Conclusion

This study examines the determinant of savings in Nigeria for the period 1990-2023. Historical data was collated and estimated employing the unit root test, Johansen co-integration test, and ECM regression technique. The outcome of the ADF unit root test showed that the variables were stationary while the empirical results for Johansen co-integration test conclude that there exists a long-run relationship between the variables. From the ECM regression results, the study concluded that savings rate, real gross domestic product and economic openness have negative effect on total savings to gross domestic product in Nigeria while financial sector developing and inflation have positive effect on savings. The regression summary proved that 74.1 and 64.8 percent variation in total savings were explained by variation in the variables as formulated, the model was statistically significant based on F-statistic and probability while the Durbin Watson proved the absence of serial autocorrelation. Based on the above, the study concluded significant effect of the variables on total savings in Nigeria.

Recommendations

i. Government should continue to develop policies that will improve the level of income of the citizenry to increase the stock of domestic savings and in turn promote economic development through sustainable investments.

ii. Economic policies that will encourage savings through subsidized deposit rates should be formulated by monetary authorities.

iii. Monetary authorities should improve the financial sector through financial deepening as it leads to increased private domestic savings mobilization which is needed for investment that will encourage economic development

iv. Government and Monetary authorities should deploy measures to combat the current economic fluctuations of inflation and exchange rate, to resolve the problem of the high cost of living.

v. That lending rate have positive and insignificant relationship with savings mobilization, this Policies, strategies and measures should be devising by the regulatory authorities to enhance the operational efficiency of the financial system through effective regulations to achieve set goals.

vi. Regulatory structure and framework of the financial system should be integrated with macroeconomic objectives such as savings mobilizations.

vii. The regulatory bodies in the financial system should be well managed to avoid conflict of policies with other macroeconomic objectives such as saving mobilization.

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