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Savings, Investment and Economic Growth in Nigeria: Evidence from ARDL Bounds Testing and Granger Causality

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ABSTRACT: The study examined the relationship between Savings, Investment and Economic Growth in Nigeria using time series data covering the period of 1990 to 2020. Specifically, the study examined: the effects of gross domestic savings on economic growth; and the effects of gross domestic investment on economic growth in Nigeria. It investigated the existence of a long run relationship between Savings, Investment and Economic Growth in Nigeria and as well examined the causal relationship between Savings, Investment and Economic Growth in Nigeria. The study employed Autoregressive Distributed Lag (ARDL) model. The ARDL long-run bounds test established the existence of long run effects of savings and investment on economic growth in Nigeria. The study revealed that savings has a positive and statistically significant relationship with economic growth in the short run and in the long run. On the contrary, investment has a negative and statistically significant relationship with economic growth in the short run and in the long run. The ECM result revealed that about 68.9% of the short run disequilibrium and inconsistencies are corrected and adjusted to long run equilibrium path. The Granger Causality test revealed no causal relationship between savings and economic growth as well as none between investment and economic growth. The study recommends that the government and policy makers should formulate and implement policies that will encourage savings and enhance the savings culture. Additionally, investment expenditures should be prioritized and strategically channeled to the real sector to boost output growth.

KEYWORDS: Savings, Investment, Economic growth, ARDL model, Co-integration, Error correction.

1.0 INTRODUCTION

Several countries that have achieved rapid economic development since World War II have two common features. First, they invested in education of men, women and in physical capital. Second, they achieved high productivity from this investment by providing efficient capital markets, competitive trade-lending roles, and higher level of economic efficiency driven by technological capabilities, stable polity, appropriate economic policy and economic system. However, as a result of market failure that may likely occur in the process of growth, it may not be ideal to leave the process of economic growth entirely to the market forces especially in the developing economies like Nigeria.

One of the cardinal economic objectives of the developing countries, including Nigeria, is to achieve high economic growth that will lead to economic development and reduce poverty from whatever theoretical angle that one may look at it, Economic growth indicates the ability of an economy to increase production of goods and services with the stock of capital and other factors of accumulation with the right combination of other factors of production will bring about their higher output growth. Utemadu (2002) stated that economic growth of countries that are able to accumulate high level of capital tend to achieve fast rates of economic growth and development. Secondly, the quality of the government and its economic policies matter a lot. The radical theorist and early proponents of development economics were of the view that growth could be internalized. Developments in the world economies have shown that it is futile for economies to isolate themselves from rapidly integrating world (Essien & Bawa, 2007).

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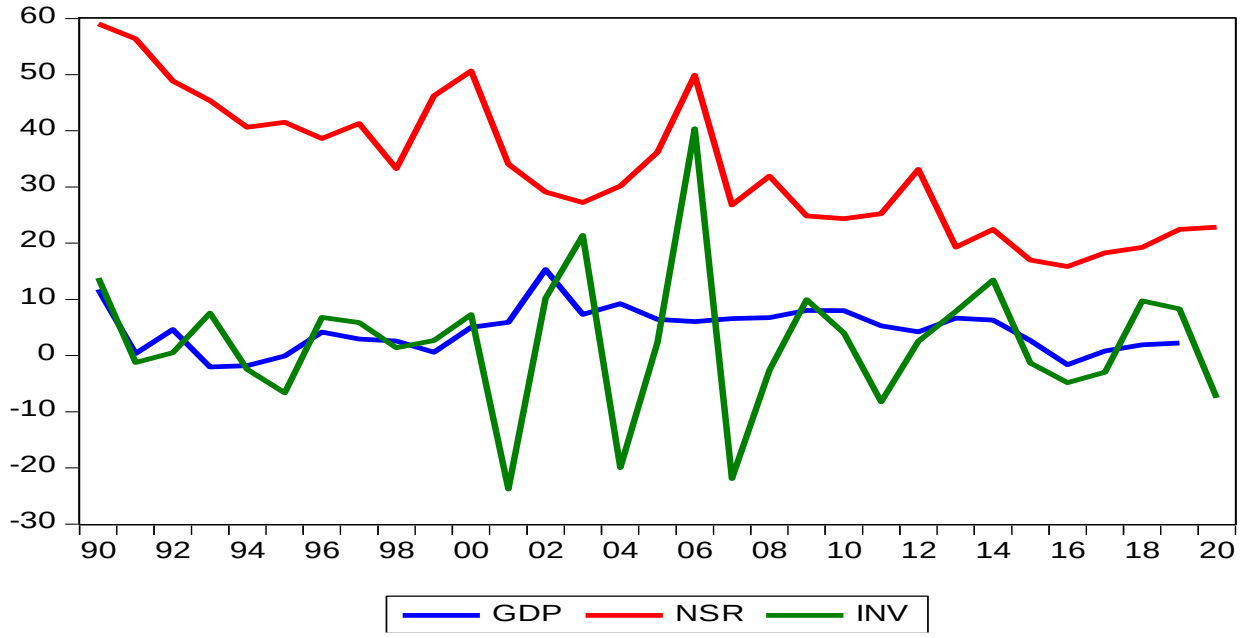


Figure 1: Trends of GDP, National Savings Rate and Investment in Nigeria (1990-2020)
Source: CBN Statistical Bulletin (Various Issues) and Author's Computation (Eviews 9)

Therefore, to finance adequate investment required for proper economic growth, every economy needs to generate sufficient savings or borrow from abroad. However, borrowing from abroad is not proper strategy for economic growth, as it may not only have adverse effects on the balance of payment as the loans will have to be serviced in the future, but also carries foreign exchange risks, devaluation of domestic currency and thus national savings becomes necessary for economic growth, because, they can provide the domestic resources that are needed to fund the investment effort of a country (Gotera, 2002).

There is an implicit belief that the Nigerian economic environment has been unable to attract foreign direct investment to its fullest potentials, given the unstable operating environment, which is characterized by inefficient capital markets, high rate of inflation, unstable polity, stringent policies and fragile financial system, among others. In Nigeria, the main factor underlying these outcomes is the volatility of government expenditure arising from the boom and business cycle of government revenue which is derived mainly from single export commodity (oil), whose price is also volatile. To worsen the problem, these expenditures are not channeled to productive sectors of the economy. Yesuf (1996) stated that another major problem is the element of fiscal dominance where a size of fiscal deficit has an implication for domestic savings and investment and ultimately economic growth.

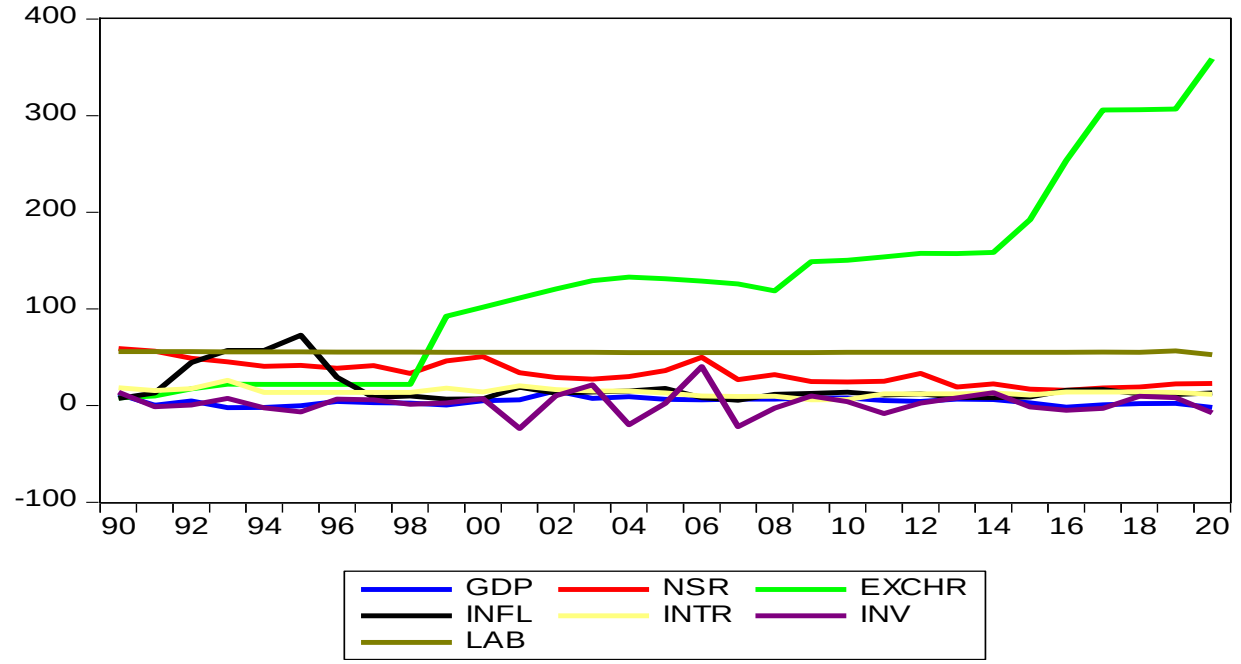


Figure 2: Trend of GDP, National Savings Rate, Investment, Exchange rate, Inflation rate, Interest rate and Labour Force Participation rate in Nigeria (1990-2020)
Source: CBN Statistical Bulletin (Various Issues) and Author's Computation (Eviews 9)

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It is believed that economic growth of any country requires investment which can be financed through domestic borrowing or private savings. Thus, we can say that economic growth depends on investment through private savings and capital accumulation. It is pertinent to access the impact of savings and investment on economic growth in Nigeria because it will provide useful information on which of the macroeconomic variable will be used to predict the level of economic growth through savings and investment. The major problem of this study is to know whether investment and savings translate into economic growth. The links between savings, investment and economic growth in Nigeria are weak because of some factors such as; low level of income, high lending rate, economic instability, corruption, overdependence on oil as export good, inadequate human capital and so on. All these translate into low rate of capital formation and low savings rate which constitute the scourge of sustainable economic growth in Nigeria.

Examining data from official sources such as the Central Bank of Nigeria's statistical bulletin for 2020 reveals trends of Gross Domestic Product, Investment and National Savings Rate between 1990 and 2020 as presented in Figure 1. From the figure, it can be seen that there was an inconsistent decrease and increase in GDP between the period of 1990 to 2000. GDP further increased between 2001 to 2002 and later declined in 2003. This may have been due to some shocks in the economy. Similarly, between year 1990 to 2000, investment experienced some level of inconsistency while it decreased sharply between 2000 and 2001. However, although Investment was at its peak in 2005, it experienced a rapid decline in 2006 and kept increasing and decreasing between 2006 and 2018. It is observed that between 2018 and 2020, there is a steady decrease in investment. Between 1990 to 1998, there was a decline in national savings rate. Between 2002 to 2005, savings increased significantly and later experienced a sharp decrease between 2005 and 2007 but steadily rose from 2015 to 2020.

Similarly, Figure 2 shows the trend of Gross Domestic Product, Investment and National Savings Rate as well as other related variables that influence growth such as exchange rate, interest rate, inflation rate and labour force participation rate. Whereas, exchange rate showed a continuous increase, labour force participation rate was static all through the period of 1990 to 2020. However, GDP, inflation, national savings rate, interest rate and investment moved in a wave-like manner.

Nigeria like any other developing countries is faced with the problem of choosing the most appropriate policies, which will be employed to attain economic growth. An identification of the factors, which influence the economy, becomes necessary. The relevant research questions that guide the study are: What is the effect of gross domestic savings on economic growth in Nigeria? What is the effect of gross domestic investment on economic growth in Nigeria? Is there any longrun relationship between Savings, Investment and Economic Growth in Nigeria? Is there any causal relationships between Savings, Investment and Economic Growth in Nigeria?

Therefore, the major objective of the study is to analyze the relationship among Savings, Investment and Economic Growth in Nigeria using annual data covering the period of 1990 to 2020. Specifically, the study seeks to: Examine the effect of gross domestic savings on economic growth in Nigeria; Examine the effect of gross domestic investment on economic growth in Nigeria; Investigate the existence of a long run relationship among Savings, Investment and Economic Growth in Nigeria; Examine the causal relationship among Savings, Investment and Economic Growth in Nigeria.

This study will broaden the knowledge of researchers, students and the general public on the relationship among Savings, Investment and Economic Growth in Nigeria. It will also provide policy makers with relevant information on investment measures that will enhance growth in the economy. It will form a tool to access the efforts of the financial sector as well as government agencies in managing polices that affect savings and investment positively in Nigeria.

The study is divided into five sections and they are as follows; section one is the introduction of the study, section two contains the literature review, section three present the methodology, the analysis and presentation of empirical results are contained in section four of this study and finally, section five of this study present the summary, conclusion and recommendation.

2.0 LITERATURE REVIEW

2.1 Conceptual Framework

2.1.1 Savings

Savings in economics is income less consumption. In general term it is the amount of money set aside for future purposes. It represents net surplus of fund for an individual or a household after all necessary expenses have been made. It can also be referred to as the money set aside for investment expenditure. Vital determinants of savings in an economy include; the level of income, income distribution, consumption motivation, Wealth, habit, population, objective and institutional factors and Interest rate

2.1.2 Investment

One of the components of the Keynesian model of income determination is investment. Investment can be seen as the purchase of real tangible asset such as machines, stock of inventories which are used in the production of goods and services for future use. Similarly, investment can be viewed as the sacrifice of certain present values of consumption for future value. It is the commitment of money in order to earn a financial return of the purchase of financial assets such as stocks or bonds with future end date in mind.

The level of investment in an economy tends to vary by a greater extent than other components of aggregate demand. This is because the underlying determinants also have a tendency to change. Thus, the main determinants of investment are: the expected return on the investment; business confidence; changes in national income; interest rates; general expectations; corporate tax on profits; and the level of savings.

2.1.3 Gross Domestic Product (GDP)

According to Nakamura and Steinsson (2014), GDP is one of the most widely used indicators to measure the economic performance of a country. It represents the total monetary value of all goods and services produced within a country's borders within a specific time period, typically annually or quarterly. GDP is a crucial metric for policymakers, economists, investors, and businesses as it provides insights into the overall health and size of an economy. Below are three types of GDP:

a. Nominal GDP: It measures the value of goods and services produced in a country using current prices. It does not account for inflation.

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b. Real GDP: It adjusts nominal GDP for changes in price levels (inflation or deflation), providing a more accurate measure of economic output over time.
c. GDP per capita: This metric divides GDP by the total population of a country, providing a measure of average economic output per person. It's useful for comparing living standards between countries.

2.1.4 Economic growth

Economic growth, as defined by Dwivedi (2004), is a sustained, long-term increase in net national product or per capita national output. This implies that the overall output of goods and services must consistently outpace population growth. Another perspective on economic growth emphasizes the importance of producing goods and services that cater to the needs of a larger population. The quantitative aspect of economic growth involves a measurable increase in the monetary value of goods and services produced within an economy over a specified period. This is typically assessed through a percentage change in either the gross domestic product (GDP) or gross national product (GNP), as outlined by Dwivedi (2004). Such growth is indicative of an expanding and thriving economy that is effectively meeting the needs of its populace while surpassing demographic trends.

2.2 Theoretical Framework

Theoretical postulations on the relationship among saving and economic growth started during the time of Adam Smith (Tang & Tan, 2014). Adam Smith says the economy needs industrialization to achieve economic growth. Not recognizing other sources of finance such as foreign direct investment (FDI) during the period, Smith submitted that industrialization can only be achieved through adequate capital accumulation. According to him, capital accumulation is strongly and positively related to the rate of saving. This means society can only accumulate capital through the increased saving. We, therefore, expect higher saving rate that will lead to an increase in capital accumulation and, consequently, higher economic growth.

2.2.1 Harrod Domar Growth Theory

The classical model of Harrod (1939) and Domar (1946) of economic growth is another theory that relates the two variables. The model assigns key role to investment in the process of economic growth. The model submitted that in an economy with a particular level of technological advancement, the rate of economic growth is directly related to the rate of capital accumulation. Also, from the perspective of neoclassical school, Solow and Swan (1956) expanded the Harrod and Domar model. Solow model postulated a continuous production function linking output to the input of capital and labour which are suitable. They clearly state that saving is a determinant of economic growth. Other determinants are population growth rate and technical progress. To them, saving affects investment and investment in an economy is directly proportional to economic growth.

2.2.2 Neoclassical Growth theory

According to the neo-classical growth models, the long run growth rate of every economy is determined exogenously either by savings rate (the Harrod-Domar model) or the rate of technical progress (Solow model). The endogenous growth theory posits that, output (economic growth) is a function of capital and labour. This is algebraically written as;

$Y = f(K, L)$ ……. (1)

Where y = income as a proxy for economic growth; K = Capital; and L = Labour

This means that labour and capital are the necessary factors of economic growth. Labour and capital are the main determinants of investment as a function of economic growth. In this perspective, savings rate and the rate of technological progress remain unexplained. Endogenous growth theory holds that, the growth rate of a country on the long run is influence by policy measures. The idea is that subsidies on research or education can act as an incentive to increased economic growth rate. The implication of the endogenous theory is that, openness, competition, change and innovation should be included as part of policy instrument to promote growth in the savings-investment paradigm.

2.2.3 Savings-Investment Theory

Similarly, other theories in this study are the saving-investment theory developed by Thomas Tooke (1844), Wicksell (1898, 1907), Aftalion (1925) and Keynes (1930). The Saving-Investment Theory also known as The Income Theory was gradually developed by Thomas Tooke, Wicksell and Aftalion and finally by Keynes. According to them, growth in output will take place in a country where there is equality of savings and investment. Furthermore, the income theory explains the relationship among saving and investment by adding that, if saving exceeds investment, people would reduce their expenditure on goods and services. The implication of this is that, people are spending less and hoarding more money. This phenomenon would reduce the velocity of money in circulation and hence reduce income of the producers of goods and services which would lead to a fall in the price level and economic growth. As price falls, investment also declines as a result of a fall in the marginal efficiency of capital which leads to a further decline in income, output, employment and price. This implies that, the economic growth of a country like Nigeria would fall if saving exceeds investment.

On the other hand, if investment exceeds saving, people would spend more on goods and services. This would cause the velocity of money in circulation to increase and hence increase the income of the producer of goods and services. The increase in income and expenditure increases the profit expectations or marginal efficiency of capital of producers of goods and services. This would boost output, employment and prices. So long as the output of goods and services increases proportionately with the increase in the demand for goods and services, there would not be a general rise in the price level. The economy of a country like Nigeria would attain full employment level when saving and investment are equal. This means that, it is the inequality of saving and investment that brings about changes in price level and income.

Therefore, a stable economic growth is possible in a country when saving and investment is equal. Savings, investment and economic growth in Nigeria have a good relationship since the saving – investment theory (income theory) has thrown more light on the equality of saving and investment for a possible economic growth. It is important to understand that a boost in income would boost investment and hence economic growth. Keynes contribution to the theory of savings – investment (income theory) is that, it is the total money income (GDP) which determines the total expenditure of a nation. An increase in total money income means increase in investment. An increase in the money income would increase investment expenditure and boost effective demand which would in turn raise output (economic growth) and employment. Accordingly,

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Keynes advocated for equilibrium between saving and investment for economic growth to take place. He demonstrated the equality of saving(S) and investment (I) using income (Y) as equal to consumption (C) plus investment (I) that is; (Y=C+I), and savings as the excess of income over consumption (S=Y-C).

Thus:

Y=C+I or I=Y-C …… (2)

S=Y-C …… (3)

S=I …… (4)

Keynes believes that a desired economic growth in a given country can only occur when savings is equal to investment as demonstrated above. Therefore, the underlying theories of this study are; Harrod Domar Growth theory, Neoclassical Growth Theory and Savings-Investment Theory.

2.3 Review of Empirical Literature

Attanasio, Picci and Scorcu (2000) analysed the short-run and long-run relationship among savings, investment and growth rate for 123 countries over the period 1961to 1994. The study employed OLS, Granger causality and impulse response functions method of analysis. The study revealed that; (i) lags of saving rates are positively related to investment rates; ii) investment rates Granger cause growth rates with a negative sign; iii) growth rates Granger-cause investment with a positive sign. Similarly, Ibrahim and Francis (2000) analyzed savings process in sub-Saharan Africa with the experiences of Kenya, Zimbabwe and Botswana, the study showed that in SSA causality runs from growth to the investment while savings granger causes the increase in Investment, the study also mentioned that Botswana is a country with lower private saving rate.

Anorou & Ahmad (2001) investigated the relationship among savings and economic growth in 7 African countries, Congo, Cote d'ivoire, Ghana, Kenya, Nigeria, South Africa and Zambia using vector error correction model. The result indicated that there is a long run relationship between economic growth and saving. Also they found that savings granger causes growth in Congo and there is bi-directional causality in South Africa and Cote d'ivoirea. Similarly, Olusoji, (2003) defined savings to be that part of income that is not spent on current consumption, but when directed to capital investment economic growth occurs rapidly. Capital formation through the mobilization of savings is a necessary factor in economic growth. As (Utemadu, 2002) rightly observed, countries that accumulate high level of capital always achieve rapid rates of economic growth. This implies that for a nation to finance larger investments for proper economic growth, sufficient savings must be generated or mobilized. This could be done either from borrowing abroad or proper capital accumulation.

Sinha and Sinha (1998) examined the causal relationship between economic growth and different components of savings (i.e. household saving, corporate saving and government saving) in Mexico using annual time series data covering 1950-2001. Results from Granger causality test shows that economic growth Granger causes household saving, corporate saving and government saving with no feedback. Verma (2007) empirically examined the relationship among savings, investment and economic growth in India using annual time series data for the period 1950/51 to 2003/04. The study applied the Autoregressive Distributed Lag (ARDL) Bounds Testing technique to test for Cointegration. The ARDL Cointegration result revealed that GDP, GDS and GDI have long-run relationship except when GDP is the dependent variable. The author also estimated the long-run and short-run elasticities of the correlation between GDS, GDI and GDP growth which exposes three conclusions. Firstly, the econometric evidence corroborates the Carroll-Weil hypothesis that savings do not cause growth, but growth causes savings. Secondly, the results obviously support the view that savings drive investment both in the short-run and in long-run. Lastly, there is no evidence that investment is the driver of economic growth in India during the sample period.

Odhiambo (2008, 2009) conducted a study in Kenya in 2008 and another one in South Africa in 2009 to study the relationship between savings and economic growth in these two countries. The study used causality and co-integration test to analyze the relationship between the variables and the study proved that there is a positive relationship between savings and economic growth. Ogoe (2009) have investigated the direction of causality between gross domestic savings and economic growth of Ghana using annual time series data from 1961-2008. To this end, Vector Autoregressive (VAR) model and pair wise Granger causality test was employed. Results from Granger causality tests showed that there is bidirectional causality between growth rates of gross domestic savings and economic growth of Ghana.

Agrawal and Sahoo (2009) examined the causal relationship between total domestic savings rate and economic growth in Bangladesh using annual time series data (1975-2004). The study has also examined the main determinants of the total domestic savings rate and the private savings rate for Bangladesh using the Autoregressive distributed lag (ARDL) approach to Cointegration. The ARDL estimation proved that there exists a stable and longrun equilibrium relationship between total savings rate, economic growth and other control variables13 included in the model. They used Granger causality analysis and Forecast Error Variance Decomposition (FEVD) analysis in the VAR framework for causality test. The results of both approaches (i.e. Granger causality and FEVD) assert bi-directional causal relationship between total domestic savings rate and economic growth in Bangladesh.

Nwachukwu & Odidie (2009) examined what drive saving in Nigeria. The study analyzed the trend in Nigerian saving behaviour and reviewed policy option to increase domestic saving as well as determinant of private savings in Nigeria within. The study adopted econometric tools in analyzing data within the period of 1970 to 2007. The result off the analysis revealed that savings rate rises with both the growth rate of disposable income and real interest rate on bank deposit. The study revealed that public savings seem not to crowd out private saving, suggesting that government policies that aimed at improving the fiscal balance have the potential of bringing about a substantial increase in the nation al saving rate. Mphuka (2010) investigated the causality between savings and economic growth in Zambia using bivariate vector auto- regression (VAR) estimation procedure. The test indicated that economic growth granger cause savings, even though the article argues that savings may influence the economic growth indirectly, because the savings will cause to accumulate capital and to inject the technologies from developed countries, in fact the technologies are the key to the economic growth.

Bakare (2011) analyzed the relationship between capital formation and economic growth in Nigeria using annual time series data covering the years 1979-2009. Harrod and Domar growth model was applied to Nigerian growth model and tested whether it can work in Nigeria. The study employed ordinary least square multiple regression analytical method to look at the relationship between capital formation and economic growth.

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Moreover, Parsimonious error correction mechanism was used to determine the long-run relationship among the variables analyzed. The study proved that the growth rate of national income is positively related to savings and capital formation, so the study emphasized the need for the government to encourage savings to promote sustainable growth in the economy.

Jangili (2011) examine the direction of relationship among saving, investment and economic growth in India at both aggregate and sectoral levels for the period 1951 to 2008. using granger causality test, Johansen co-integration test and vector error correction model. The co-integration test result suggests that there exist co-integration relationship among all series with GDP except private corporate savings. The study also found that the direction of causality runs from savings and investment to economic growth collectively as well as individually and there is no causality from economic growth to savings and investment. Misztal (2011) analyzed the cause-and-effect relationship between economic growth and savings in advanced economies and in emerging and developing countries using annual time series data covering the period 1980-2009. Co-integration model and Granger causality tests were used to analyze the data. The empirical results supported that the growth of gross domestic savings positively causes the growth of Gross domestic product in advanced economies, as well as in emerging and developing economies with no feedback effect.

Budha (2012) examines the relationship between the gross domestic savings, investment and growth for Nepal using annual time series data for the period of 1974/75 to 2009/10. The study employed the Autoregressive Distributed Lag (ARDL) approach to test for cointegration and error correction based Granger causality analysis for exploring the causality between the variables of interest. Empirical results show that cointegration exists between gross domestic savings, investment and gross domestic product when each of them is taken as dependent variable. Granger causality analysis shows that there is short-run and long-run bidirectional causality between investment and gross domestic product as well as between gross domestic savings and investment. Nevertheless, no short-run causality is found between gross domestic savings and gross domestic product.

Udousoro, et al (2013) tested the direction of causality between savings and economic growth in Nigeria between 1980 and 2010 using a tri-variate dynamic Granger causality model. They found that growth-led savings is predominant for Nigeria. In other words, there is uni-directional causality between savings and growth in Nigeria. Mandishekwa (2014) studied the casual relationship between investment and economic growth based on Zimbabwe, but the findings revealed that there is no causality from any direction between two variables. However, the study does not deny any other relationship between the investment, savings and economic Growth.

Ewetan and Ike (2014) analyzed the relationship between financial sector development and domestic savings in Nigeria between 1980 and 2012 (33 observations) using autoregressive distributed lag model. In their model, three measures of financial development were collapsed into one composite measure because of their high correlation and they found that financial development has a positive and significant impact on domestic savings. Taking the financial development measures one at a time, each measure is positively related to domestic savings. Nwanne (2016) examined implications of savings and investment on economic growth in Nigeria using ADF, ADRL and cointegration test. The study revealed that there is a long-run relationship among savings, investment and economic growth in Nigeria. Also, that changes in gross domestic savings movement has negative and significant effect on changes in economic growth in Nigeria and that changes in gross domestic investment has positive and significant effect on the change in the Nigerian economic growth. Therefore, he recommended that government should set up a sound and fertile environment in order to encourage domestic savings that will help increase the level of economic growth in Nigeria.

Shimelis (2014) examined the causal relationship among savings, investment and economic growth in Ethiopia using annual time series data from 1969 to 2011 with economic tool involving ADF, ADRL and Granger Causality test. The study revealed that there exists a bidirectional causal relationship between gross domestic investment and economic growth and between gross domestic savings and gross domestic investment. Also, a unidirectional granger causality running from economic growth to gross domestic savings. He recommended that the country is required to increase savings and investment, with due emphasis given to investment due to its dual effect in order to attain high and sustained economic growth. Ayinde and Yinusa (2016) investigated the relationship between financial development and inclusive growth in Nigeria using the method of quantile regression based on data from 1980 to 2013. They also found the threshold effect of the financial development on inclusive growth is 90th percentile. They also found among other things that the impact of financial development on inclusive growth depends on the measure of financial development used. Their Granger causality results show that causality runs from inclusive growth to financial development and not vice versa.

Ojiegbe, Duruechi and Makwe (2016), investigated the effect of savings and investment on the economic growth of Nigeria. To achieve the objectives of the study, secondary data were sourced from the Central Bank of Nigeria statistical bulletin providing record of Nigerian saving, investment and Gross Domestic Product (GDP) over the period 1980-2014. The data gathered were analyzed using the ordinary least square method of analysis, the augmented Dickey Fuller Test, Granger Causality Test, Error Correction Model and the co-integration test were equally carried out to check the stationarity and the causal direction of the variables and also to check the long run relationship between the variables of study. The result of the statistical analysis revealed that there is a long relationship among saving, investment and economic growth in Nigeria.

Odey et al (2017) analyzed the impact of savings and investment on economic growth in Nigeria using the annual time series data within the period of 1970 to 2015 using econometric approach involving unit root test, cointegration test and error correction model. The study reveals that if there is proper capital accumulation in form of saving, investment would be great and sustainable. The study recommended the need for Central Bank of Nigeria (CBN) to reduce the cash reserve requirements for commercial banks in order to make available adequate funds inform of loans for investment which will in-turn boost economic growth.

Ominyi & Okoh (2017) studied savings as predicators for sustainable economic growth in Nigeria with data sourced from 1986 to 2015 using econometric tool in carrying out the analysis. The result showed a positive relationship between GDP and savings. That a percent change in savings will lead to a 8.9% change in GDP. The research recommended that government through the Central Bank of Nigeria (CBN) adopt policies that ensures accountability of the Deposit Money Bank in their business practices as this will promote trust and encourage the populace to save. Gidigbi and Donga (2020) examined impact of savings on economic growth in Africa using annual time series data from 1980 to 2915 using analytical technique of Panel Estimated Generalized Least Square (EGLS) with cross section Seemingly Unrelated Regression (SUR) to estimate the data.

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The study revealed that savings contribute to economic growth but not significantly if compared Foreign Direct Investment (FDI). The study concluded that savings is relevant to economic growth in Nigeria. The study recommended that policies favouring savings should be encouraged. Osmond & Adeleke (2021) in their study examined the impact of savings and investment on economic growth in Nigeria using time series data from the period of 1980 to 2019 with the aid of some statistical test such as ARDL estimation technique, Augmented Dicky Fuller test and co-integration test on Nigerian data. Their results show that savings and investment have negative and statistically significant effect both in short-run and in long -run on economic growth in Nigeria. These imply that Nigeria has grossly low saving culture and maybe experiencing deficiency demand problem. They suggested that the focus of development policies in Nigeria should be on the monetary and fiscal policies so as to encourage high investment and savings culture.

Olayiwola, Okunade, and Fatai (2021) analyzed saving-growth nexus in developing countries with Nigeria as a case study taking into account characteristics of the pre and post democratic dispensation. A multivariate VECM causality test was carried out for the period of 1981 to 2019. In the short-run, he discovered that there was no significant causal relation between savings and growth during the pre-democracy period but there exist a unidirectional causality running from savings to growth in the post-democracy period. Also, it was discovered that there is a bidirectional causal relationship between savings and growth in the long-run for both pre- and post-democracy period. This imply that savings causes economic growth in the post democracy period in the short-run while savings and growth reinforce each other in the long-run for both periods. Therefore, it was recommended that Nigerian policy-makers and government should embark on monetary policies that would increase deposit rate to encourage more savings so as to mobilize fund from the surplus-side to the deficit-side of the economy for productive investment.

3.0 RESEARCH METHODOLOGY

3.1 Research Design

The research design adopted for this study is the ex-post facto design. This design is suitable for investigations or evaluations conducted retrospectively, utilizing existing information from past events. It is particularly apt for after-the-fact research scenarios where data analysis is based on historical information. The study employed econometric methods in analyzing the relationship between Savings, Investment and Economic Growth in Nigeria.

3.2 Nature and Sources of Data

Data used for this study are annual time series data covering the period 1990 to 2020. All data used for this study are secondary data were obtained from sources such as the Central Bank of Nigeria (CBN) Statistical Bulletin (various issues), Central Bank annual reports, annual report of the Nigerian stock exchange, various publications of financial institutions reports and Educational Journals, World Bank and World Development Indicators (WDI).

3.3 Model specification

The underlying theories of this study are the Harrod Domar Growth theory, Neoclassical Growth Theory as well as the Savings-Investment Theory. In examining the impact of Savings and investment on economic growth in Nigeria, the study specifies a model wherein Gross Domestic Product (GDP) is expressed as a function of Savings (NSR) and Investment (INV). The model is presented as in Equation 5.

$GDP = f(NSR, INV)$ ..... (5)

However, to ensure that our model is not underspecified, Equation 5 is modified such that other variables such as interest rate, inflation rate, exchange rate and labour force participation rate are all included in the model as expressed in Equation 6.

GDP = f (NSR, INTR, INFL, EXCR, INV, LAB) ……. (6)

(+) (-) (-) (+/-) (+) (+/-)

Equation 6 can be restated in the econometric form as in equation 7:

$RGDP_t = \beta 0 + \beta 1 NSR_t + \beta 2 INTR_t + \beta 3 INFL_t + \beta 4 EXCR_t + \beta 5 INV_t + \beta 6 LAB_t + \mu_t$

……..……...(7)

Where:

GDP = Real Gross Domestic Product (%)

NSR = National Savings Rate (%)

INTR = Interest rate (%)

INFL = Inflation rate(%)

EXCR = Exchange rate (%)

INV = Investment (proxied by Gross fixed capital formation) (%)

LAB = Labour force participation rate (%)

$\beta 0$ = Constant Parameter

μ_t = Error term

$\beta_1, \beta_2, \beta_3, \beta_4 \beta_5$ and β_6, = Represent the coefficients of the explanatory variables.

A priori expectations: The figures in parenthesis in equation 6 represents a priori expectation about the signs of the coefficients.

3.4 Analytical Techniques

The analytical techniques are based on the specific objectives of this study. If the variables used in this study are integrated of order one [I(1)] and order zero [I(0)], Autoregressive Distributed Lag (ARDL) estimation technique will be adopted to examine the shortrun relationship among variables. Bound test will be carried out to test for a longrun cointegration relationship among the variables. And if there is a longrun relationship among variables, Error Correction Model (ECM) will be estimated in order to ascertain the speed of adjustment back to equilibrium.

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3.4.1 Objective 1:

To examine the effect of gross domestic savings on economic growth in Nigeria, the study adopts an Auto Regressive Distributed Lag Model and Bound Test.

3.4.1 a Auto Regressive Distributed Lag (ARDL) Model:

ARDL estimation is carried out when the unit root is integrated of order zero (I(0)) and order one (I(1)). It's a tool used in analyzing the shortrun relationship between variables under study. Therefore the general form of ARDL(P, Q) model is given as;

$Y_t = \Upsilon_{oi} + \sum_{i=0}^{p} \delta i Y_{t-1} + \sum_{i=0}^{q} \beta_i X_{t-1} + \mu_{it}$ ..... (8)

Where p is associated with the lag value of the dependent variable while the lag value of the regressor take the alphabet q.

Where; X_t are the regressors; Y_t is the dependent variable; β and δ are coefficients; Υ is the constant; i=1,2,…,k is the number of variables; p, q are optimal lag orders ; μ_{it} is the error term

From equation (7), the ARDL model for this study is specified thus;

$GDP_t = \alpha_0 + \sum_{i=1}^{n} \beta_i GDP_{t-i} + \sum_{i=0}^{n} \delta_i NSR_{t-i} + \sum_{i=0}^{n} \varphi_i INTR_{t-i} + \sum_{i=0}^{n} \vec{\delta}_i INFL_{t-i} + \sum_{i=0}^{n} \emptyset_i INV_{t-i} + \sum_{i=0}^{n} \partial_i EXR_{t-i} + \sum_{i=0}^{n} \gamma_i LAB_{t-i} + \mu_t$ …… … (9)

3.4.2 Objective 2:

To examine the effect of gross domestic investment on economic growth in Nigeria. Auto Regressive Distributed Lag Model is employed in the study.

3.4.3 Objective 3:

To investigate the existence of a longrun relationship between Savings, Investment and Economic Growth in Nigeria. The study adopts a bound test in estimating the longrun relationship between variables under study.

3.4.3a Bounds Test:

The bound test is employed to test for cointegration when the time series variables in an econometric model are integrated of order of I(0) and I(1). The ARDL model is normally used to carry out the bound test. To perform the bound test, the conditional ARDL (p, q_1, q_2, q_3, q_4, q_5, q_6) model with the six variables is specified with this hypothesis;

$H_o: b_{1i} = b_{2i} = b_{3i} = b_{4i} = b_{5i} = b_{6i} = b_{7i} = 0$ …… (10)

$H_1: b_{1i} \neq b_{2i} \neq b_{3i} \neq b_{4i} \neq b_{5i} \neq b_{6i} \neq b_{7i} \neq 0$ …… (11)

(where i = 1, 2, 3, 4,5,6,7)

H_o imply that the coefficient of the long-run equations are all equal to zero. Meaning that there is no cointegration against the alternative hypothesis (H_1) which state that the coefficient of the long-run equations are not equal to zero implying that there is a long-run cointegration.

If there is a long-run cointegration, we go ahead and specify an error correction model (ECM) or a vector Error Correction Model (VECM).

If there is no cointegration, the ARDL (p, p, q_1, q_2, q_3, q_4, q_5, q_6) model be specified thus:

$\Delta InGDP_t = \alpha_{0i} + \sum_{i=0}^{p} \alpha_{1i} \Delta InNSR_{t-1} + \sum_{i=0}^{q1} \alpha_{2i} \Delta InINTR_{t-1} + \sum_{i=0}^{q2} \alpha_{3i} \Delta InINFL_{t-1} + \sum_{i=0}^{q3} \alpha_{4i} \Delta InEXCR_{t-1} + \alpha_{5i} \Delta InINV_{t-1} + \alpha_{6i} \Delta InLAB_{t-1} + \mu_t$ ..... (12)

But if there is cointegration, the error correction model will be incorporated into the model and represented thus:

$\Delta InGDP_t = \alpha_{0i} + \sum_{i=0}^{p} \alpha_{1i} \Delta InNSR_{t-1} + \sum_{i=0}^{q1} \alpha_{2i} \Delta InINTR_{t-1} + \sum_{i=0}^{q2} \alpha_{3i} \Delta InINFL_{t-1} + \sum_{i=0}^{q3} \alpha_{4i} \Delta InEXCR_{t-1} + \alpha_{5i} \Delta InINV_{t-1} + \alpha_{6i} \Delta InLAB_{t-1} + \gamma ECT_{t-1} + \mu_t$ …… (13)

3.4.4 Objective 4:

To examine the causal relationship among Savings, Investment and Economic Growth in Nigeria. The study adopts a Granger Causality Test in analyzing the causal relationship between variables.

3.4.4a Granger Causality Test

The causality test is used to determine the cause-and-effect relationship among savings, investment and economic growth. There are several tests for causality but this study will adopt the Granger Causality Test to determine the causal relationship between economic growth proxied by GDP growth rate and Savings. The granger causality test is a bilateral test and it is estimated as thus:

$GDP_t = \sum_{i=1}^{n} \alpha i\, NSR_{t-1} + \sum_{j=1}^{n} \beta_j\, GDP_{t-1} + U_{1t}$ …….. (14)

$NSR_t = \sum_{i=1}^{n} \lambda_l\, GDP_{t-1} + \sum_{j=1}^{n} \delta_j\, NSR_{t-1} + U_{2t}$ ……... (15)

Where: U_{1t} and U_{2t} are the error term and are assumed to be uncorrelated.

3.5 Diagnostic Tests

3.5.1 Pre-estimation tests

3.5.1a Unit Root Test

The unit root test is involved with the testing for the order of integration of each variable. A series is said to be integrated of order I(1) if it needs to be differenced once to become stationary. The same holds for an I(2) series which will need to be differenced twice to become stationary. Thus, a stationary series is integrated of order zero I(0) (i.e, no differencing is necessary). The study will employ the Augmented Dickey-Fuller (ADF) and the Philips-Perron (PP) unit root tests to determine the order of integration of each series.

3.5.2 Post-estimation tests

a) Breusch-Godfrey test is a statistical test that checks for the presence of serial correlation or autocorrelation in the residuals of a regression model. In other words, it determines if there is a pattern in the residuals that can be explained by previous residuals or errors.

b) The Breusch-Pagan-Godfrey test is a statistical test used to determine whether there is heteroscedasticity in a regression model. The test involves regressing the squared residuals from a linear regression model on the independent variables in the original model. The resulting regression model is then used to calculate a test statistic, which is compared to a chi-square distribution to determine the p-value. In summary, if the p-value is less

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than 0.05, it indicates that there is evidence of heteroscedasticity in the data, and the regression results should be interpreted with caution. If the p-value is greater than 0.05, there is no evidence of heteroscedasticity, and the regression results are considered reliable.

c) The Jarque-Bera test is a statistical test used to determine whether a given dataset has a normal distribution. The test calculates a test statistic, which is compared to a critical value from a chi-squared distribution with two degrees of freedom. If the test statistic is larger than the critical value, then the null hypothesis of normality is rejected. If the null hypothesis is rejected, it means that the data does not have a normal distribution. However, if the null hypothesis is not rejected, it does not necessarily mean that the data is normally distributed, as the test is not very sensitive to departures from normality when the sample size is small.

4.0 DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

4.1 Descriptive Statistics

The study conducted descriptive statistics as presented in Table 2 to provide a summary of the data used and it helps in understanding its characteristics. Descriptive statistics is important because it provides a concise summary of the main features of a dataset; allows for a preliminary exploration of the data; helps identify data errors, inconsistencies, or missing values and creates a visual representation of data making it easier to understand patterns, and distributions. Descriptive statistics shows if the data set is normally distributed or not. Descriptive statistics give us the mean of the series, the median of the series, the maximum and minimum value of the series, standard deviation, skewness, kurtosis, Jarque-Bera, probability, sum, sum of square deviation, and observation.

Table 1: Descriptive Statistics of all Variables

	GDP	EXCHR	INFL	INTR	INV	LAB	NSR
Mean	4.341822	129.3244	18.09509	13.72581	2.339559	55.15432	33.30401
Median	4.631193	128.6517	12.55496	13.50000	2.551734	55.10000	31.95077
Maximum	15.32916	358.8108	72.83550	26.00000	40.38866	56.66000	59.02455
Minimum	-2.035120	8.038285	5.388008	6.000000	-23.74670	52.69300	15.84586
Std. Dev.	4.081692	97.16654	16.63475	3.881771	12.38885	0.611823	12.12477
Skewness	0.413104	0.685839	2.129950	0.761996	0.360296	-1.556560	0.451550
Kurtosis	3.180689	2.839454	6.409527	5.080313	4.916635	10.51168	2.167995
Jarque-Bera	0.923888	2.463564	38.45502	8.589916	5.415625	85.40091	1.947605
Probability	0.630058	0.291772	0.000000	0.013637	0.066683	0.000000	0.377644
Sum	134.5965	4009.058	560.9478	425.5000	72.52634	1709.784	1032.424
Sum Sq. Dev.	499.8063	283240.1	8301.444	452.0444	4604.508	11.22981	4410.302
Observations	31	31	31	31	31	31	31

Source: Author's Computation (Eviews 9)

From the summary statistics presented in Table 1, the mean value for GDP is 4.31822, median value of GDP is 4.631192, the maximum value is 15.32916 and the minimum value -2.035120, the standard deviation value is 4.081692. GDP has a positive skewness. Given the probability value, GDP is statistically insignificant. The mean value for exchange rate is 129.3244, median value of exchange rate is 128.6517, the maximum value is 358.8108 and the minimum value 8.038285, the standard deviation value is 97.16654. Exchange rate has a positive skewness. Given the probability value, Exchange rate is statistically insignificant. The mean value for inflation is 18.09509, median value of inflation is 12.55496, the maximum value is 72.83550 and the minimum value 5.388008, the standard deviation value is 16.63475. inflation has a positive skewness. Given the probability value, inflation is statistically significant.

The mean value for interest rate is 13.72581, median value of interest rate is 13.50000, the maximum value is 26.00000 and the minimum value 6.000000, the standard deviation value is 3.881771. interest rate has a positive skewness. Given the probability value, interest rate is statistically significant. The mean value for investment is 2.339559, median value of investment is 2.551734, the maximum value is 40.38866 and the minimum value -23.74670, the standard deviation value is 12.38885. investment has a positive skewness. Given the probability value, investment is statistically insignificant. The mean value for labour is 55.15432, median value of labour is 55.10000, the maximum value is 56.66000 and the minimum value 52.69300, the standard deviation value is 0.611823. labour has a positive skewness. Given the probability value, labour is statistically significant. The mean value for national savings rate is 33.30401, median value of national savings rate is 31.95077, the maximum value is 59.02455 and the minimum value 15.84586, the standard deviation value is 12.12477. national savings rate has a positive skewness. Given the probability value, national savings rate is statistically insignificant.

4.2 Correlation Matrix

The study also conducted a correlation matrix which is a useful statistical analysis technique that provides insights into the relationships between multiple variables in a dataset. Some of the reasons for running a correlation matrix are that it helps to identify the strength and direction of relationships between variables; assists in variable selection by identifying highly correlated variables and provides valuable insights for decision-making and policy formulation. This is presented in Table 2 which depicts the correlation matrix for our variables in the model. However, there is no correlation coefficient that exceeds or is even close to 0.70 in absolute terms. For this reason, in our model, there is no problem of multicollinearity which enhances the reliability for regression analysis.

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Table 2: Correlation Matrix of All Variables

t-Statistic							
Probabilit	GDP	EXCHR	INFL	INTR	INV	LAB	NSR
GDP	1						
EXCHR	-0.14242	1					
	-0.77486	-----					
	0.4447	-----					
INFL	-0.42067	-0.39942	1				
	-2.49704	-2.34625	-----				
	0.0185	0.026	-----				
INTR	-0.17818	-0.32864	0.362481	1			
	-0.97514	-1.87389	2.094465	-----			
	0.3376	0.0711	0.0451	-----			
INV	0.185691	-0.05156	-0.14301	-0.07672	1		
	1.017675	-0.278	-0.77815	-0.41439	-----		
	0.3172	0.783	0.4428	0.6816	-----		
LAB	-0.0215	-0.39798	0.258968	0.356463	0.171503	1	
	-0.11583	-2.33613	1.443839	2.05458	0.93746	-----	
	0.9086	0.0266	0.1595	0.049	0.3563	-----	
NSR	0.009862	-0.75971	0.275091	0.432743	0.21859	0.312837	1
	0.053113	-6.29156	1.540857	2.584964	1.206314	1.773705	-----
	0.958	0	0.1342	0.015	0.2374	0.0866	-----

Source: Author's Computation (Eviews 9)

Table 2 shows the correlation matrix for the variables used in the regression analysis. The matrix shows that, GDP has 100% correlation with GDP. Exchange rate shows a low correlation relationship with GDP and its statistically insignificant. Inflation shows a low correlation relationship with GDP and exchange rate and its statistically insignificant. Interest rate shows a low correlation relationship with GDP and its correlation relationship is statistically insignificant. Investment, labour and national savings rate have a low correlation relationship with GDP and are statistically insignificant.

4.3 Unit Root Test Results

The variables in the model were subjected to unit root tests to determine the stationarity of the variables. The test was carried out at levels and first differences of the chosen variables and was performed assuming intercept and trend in Augmented Dickey Fuller (ADF) and Philip Perron (PP) specifications. The null hypothesis states that each of the variables has unit root, that is, each is non-stationary whereas the alternative hypothesis states that each variable does not have unit root, that is, each variable is stationary. The unit root test results are contained in Table 3 and Table 4. The decision rule states that for variable to be stationary at any level, the absolute value of the t- statistic must be higher than the absolute critical value at 5% level of significance.

Table 3: Unit Root Test Based on Augmented Dickey Fuller

Variable	T- statistic value	1% critical value	5% critical value	10% critical value	Order of integration
National savings rate	-4.570141	-3.769597	-3.004861	-2.642242	I(1)
Inflation	-4.442002	-3.679322	-2.967767	-2.622989	I(1)
Exchange rate	-3.787521	-3.679322	-2.967767	-2.622989	I(1)
Interest rate	-3.082970	-3.670170	-2.963972	-2.621007	I(0)
Investment	-10.10287	-3.679322	-2.967767	-2.622989	I(0)
GDP	-3.258039	-3.670170	-2.963972	-2.621007	I(0)
Labour	-13.86906	-3.679322	-2.967767	-2.622989	I(1)

Source: computed by Author (using Eviews 9)

Tables 3 and Table 4 present the results of the Augmented Dickey Fuller (ADF) and Philip Perron (PP) for the order of integration of the variables under investigation. The essence of the test is to determine whether the series: Gross Domestic Product (GDP); National Savings Rate (NSR);

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Interest Rate (INTR); Inflation Rate (INFR); Exchange rate (EXCR), Labour (LAB) and Investment (INV) are Stationary (i.e., have no unit roots) and their order of integration. Thus, the essence of the test is the null hypothesis of non-stationarity. To reject the null hypothesis, the ADF and PP statistics must be more positive or negative than the critical values and significant.

Table 4: Unit Root Test Based On Phillips Perron

Variable	T- statistic value	1% critical value	5% critical value	10% critical value	Order of integration
National savings rate	-11.97097	-3.679322	-2.967767	-2.622989	I(1)
Inflation	-4.428972	-3.679322	-2.967767	-2.622989	I(1)
Exchange rate	-3.689681	-3.679322	-2.967767	-2.622989	I(1)
Interest rate	-3.009915	-3.670170	-2.963972	-2.621007	I(0)
Investment	-10.39587	-3.670170	-2.963972	-2.621007	I(0)
GDP	-3.424911	-3.670170	-2.963972	-2.621007	I(0)
Labour	-12.56681	-3.679322	-2.967767	-2.622989	I(1)

Source: computed by Author (Eviews 9)

The decision rule for unit root test holds that we reject the null hypothesis if the t-statistics is greater than the critical value at 5% significance level and conclude that there is no unit root and the variable is stationary. From the results presented in Table 3 and Table 4, National Savings rate, inflation, exchange rate and labour are stationary and integrated of order one I(1) while interest rate, investment and GDP are stationary and integrated of order zero I(0) at 5% critical level respectively. Based on the mixed order of integration between I(0) and I(1) among our variables, this justifies adoption of ARDL techniques to investigate the effect of savings and investment on economic growth in Nigeria and the longrun relationship between the variables.

4.4 Cointegration Test Results

Table 5: ARDL Bounds Test Result for Cointegration

Test Statistic	value	Significant Level	Bound Lower I(0)	Bound Upper I(1)
F-Statistic	4.393489			
k	6	10%	2.12	3.23
		5%	2.45	3.61
		2.5%	2.75	3.99
		1%	3.15	4.43

Source: Author's Computation (Eviews 9)

Cointegration among time series variables suggests that series may behave in different ways in the short run but that they will converge towards common equilibrium behaviour in the long run. The ARDL Bounds Test is used to test for cointegration amongst the variables in the model. The cointegration test result is contained in Table 5.

The co-integration test was conducted to ascertain the long run relationship among the variables after the data have been ascertained to be free from unit root. The ARDL Bounds test result for cointegration (longrun relationship between variables) is presented in Table 5. The bound test decision criterion holds that if the F-statistics value is greater than the value of the lower bound and higher bound at 5% significance, we reject the null hypothesis and conclude that there is a longrun relationship. From the result above, the F-statistics value (4.393489) is greater than the upper bound and lower bound 5% significance level of 3.99 and 2.75 respectively. We therefore reject the null hypothesis and conclude that there is a longrun relationship between variables.

4.5 ARDL Short Run Estimates

Table 6: ARDL Short-Run Test Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDP(-1)	-0.002123	0.200722	-0.010578	0.9917
GDP(-2)	0.312302	0.166741	1.872970	0.0879
EXCHR	-0.094191	0.033157	-2.840725	0.0161

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EXCHR(-1)	0.088759	0.027368	3.243167	0.0078
INTR	-0.274035	0.171443	-1.598401	0.1383
INTR(-1)	-0.038460	0.152566	-0.252088	0.8056
INTR(-2)	0.469243	0.172057	2.727256	0.0197
INFL	-0.254348	0.056539	-4.498664	0.0009
INFL(-1)	0.119430	0.060541	1.972702	0.0742
INFL(-2)	-0.126609	0.057163	-2.214893	0.0488
INV	-0.173613	0.065311	-2.658263	0.0223
INV(-1)	-0.164689	0.049128	-3.352266	0.0065
INV(-2)	-0.175751	0.063826	-2.753609	0.0188
LAB	0.203418	0.935397	0.217467	0.8318
NSR	-0.027097	0.081567	-0.332202	0.7460
NSR(-1)	-0.100184	0.110400	-0.907463	0.3836
NSR(-2)	0.198395	0.082875	2.393912	0.0356
C	-5.448105	54.35068	-0.100240	0.9220

R-squared	0.889225	Mean dependent var	4.222802
Adjusted R-squared	0.718026	S.D. dependent var	3.910824
S.E. of regression	2.076694	Akaike info criterion	4.571410
Sum squared resid	47.43923	Schwarz criterion	5.420077
Log likelihood	-48.28545	Hannan-Quinn criter.	4.837202
F-statistic	5.194123	Durbin-Watson stat	2.926767
Prob(F-statistic)	0.004117		

Source: Author's Computation (Eviews 9)

Having established the existence of long run relationship amongst the variables, we sought to determine the short run effects of savings and investment on economic growth in Nigeria, using the

ARDL model. The result is presented in Table 6. From the ARDL short run result presented in Table 6, the coefficient of multiple determination R^2 is 0.889225 which implies that 88% variation of the dependent variable (GDP) is explained by the independent variables and probability F statistics value of 0.004117 which is less than 5% significance level, implying that the variables are statistically significant and that the overall relationship in the model is significant.

From the results in Table 6, exchange rate indicates a positive relationship with GDP during the first period lag and its statistically significant in the shortrun. Inflation indicates an inverse relationship with economic growth in the shortrun and it is statistically significant because its probability value is less than 5% significant level. Interest rate shows a strong positive relationship with economic growth in the shortrun at second lag period and is statistically significant implying the need for policy makers to use interest rate as a tool to enhance economic growth. Investment, indicates a negative relationship with economic growth in the shortrun but statistically significant. National savings rate in lag 2 indicates that there is a shortrun positive relationship with GDP and it is statistically significant. Labour indicates that there is a shortrun positive relationship with GDP and it is statistically insignificant.

4.6 ARDL Error Correction Model Test Results and Long Run Estimates

Table 7: ARDL Error Correction Model Results

Cointegrating Form				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(GDP(-1))	-0.312302	0.166741	-1.872970	0.0879
D(INFL)	-0.254348	0.056539	-4.498664	0.0009
D(INFL(-1))	0.126609	0.057163	2.214893	0.0488
D(EXCHR)	-0.094191	0.033157	-2.840725	0.0161
D(INTR)	-0.274035	0.171443	-1.598401	0.1383
D(INTR(-1))	-0.469243	0.172057	-2.727256	0.0197
D(INV)	-0.173613	0.065311	-2.658263	0.0223
D(INV(-1))	0.175751	0.063826	2.753609	0.0188
D(LAB)	0.203418	0.935397	0.217467	0.8318
D(NSR)	-0.027097	0.081567	-0.332202	0.7460
D(NSR(-1))	-0.198395	0.082875	-2.393912	0.0356
CointEq(-1)	-0.689822	0.228932	-3.013218	0.0118
Cointeq = GDP - (-0.3791*INFL -0.0079*EXCHR + 0.2272*INTR -0.7452				

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*INV + 0.2949*LAB + 0.1031*NSR -7.8978)

Table 8: ARDL Long Run Coefficients

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
INFL	-0.379123	0.088882	-4.265459	0.0013
EXCHR	-0.007874	0.018551	-0.424433	0.6794
INTR	0.227230	0.283771	0.800752	0.4402
INV	-0.745196	0.320201	-2.327279	0.0401
LAB	0.294885	1.401591	0.210393	0.8372
NSR	0.103092	0.188015	0.548319	0.5944
C	-7.897845	80.143918	-0.098546	0.9233

Source: Author's Computation (Eview 9)

The ARDL long run model shows that inflation rate and investment have negative and significant relationship with economic growth while exchange rate has positive and statistically insignificant relationship with economic growth in the long run. On the contrary, interest rate, labour force participation rate and savings rate all have positive and statistically insignificant relationship with economic growth. Additionally, the error correction term CointEq(-1) in the model has the expected sign (that is, negative) and significant at 5% probability level. The existence of a longrun relationship among the variables under study is validated by this result. The coefficient of the error correction term in absolute terms (0.689822) represent the speed of adjustment. The value indicates about 68.9% of the shortrun disequilibrium and inconsistency are being corrected and adjusted into the longrun equilibrium path.

4.7 Granger Causality Test Results

The Granger Causality Test results are presented in Table 9. The results reveal no causality between savings and GDP given that the F-Statistic probability values 0.2968 and 0.4583 are greater and not significant at 5% significance level. Similarly, the table equally shows the granger causality test results between investment and GDP. The probability values are 0.5851 and 0.7501 which implies that there is no causal relationship between investment and GDP since the probability values are both greater than 5% significance level.

Table 9: Granger Causality Test Results

Null Hypothesis:	Obs	F-Statistic	Prob.
INV does not Granger Cause GDP	29	1.27835	0.2968
GDP does not Granger Cause INV		0.80620	0.4583
NSR does not Granger Cause GDP	29	0.54809	0.5851
GDP does not Granger Cause NSR		0.29098	0.7501

Source: Author's Computation (Eview 9)

4.8 Diagnostic Test Results

4.8.1 Test for Autocorrelation

The Breusch-Godfrey LM Test is used in this study to check for Serial Correlation. The null (H_0: the absence of serial correlation) and alternative (H_1: the presence of serial correlation) hypotheses. The decision rule is to accept the null hypothesis if the p-value is greater than 0.05 or reject it if the p-value is less than 0.05.

Table 10: Breusch-Godfrey Serial Correlation Test Result

F-statistic	5.079575	Prob. F(2,9)	0.3334
Obs*R-squared	15.37727	Prob. Chi-Square(2)	0.2315

Table 10 shows the results of the test. The probability values of the F and Chi-square are greater than 0.05. Therefore, we accept the null hypothesis of no autocorrelation and conclude that there is no serial correlation amongst the variables.

4.8.2 Test for Normality

The classical normal linear regression model assumes that each error term is distributed normally. This study made use of the Jarque-Bera normality test to find out if the estimated errors are normally distributed. In this study, the null hypothesis (H_0: The data follows a normal distribution) and the alternative hypothesis (H_1: The data does not follow a normal distribution) were tested. The Decision rule is to: Reject H0 if the histogram is not bell shaped and the p-value of the Jarque-Bera statistics is significant at 5% level of significance; otherwise, we fail to reject H0. Figure 3 represents the normality test result.

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Figure 3: Histogram of Normality Test Result

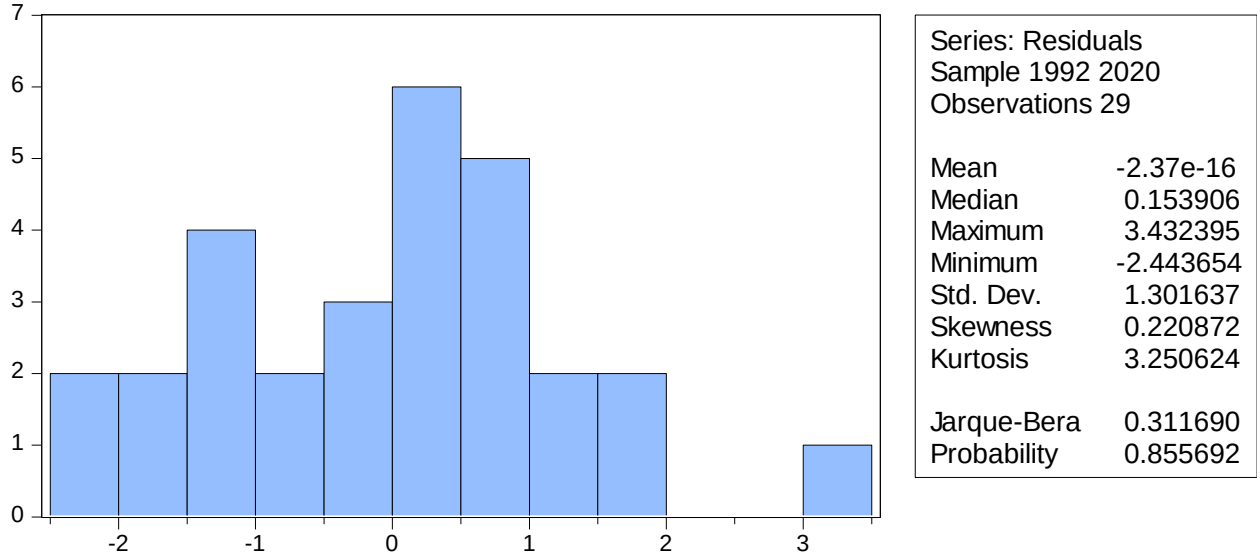


Figure 3: Jarque-Bera Normality Test Result
Source: Author's Computation (EViews 9).

From Figure 3, the histogram is bell shaped with a Jarque-Bera value of 0.312 and p-value of 0.85 which is greater than 0.05. Therefore, we accept the null hypothesis and conclude that the model follows a normal distribution.

4.8.3 Test for Heteroskedasticity

The Breusch-Pagan-Godfrey test is employed in this study to check for Heteroskedasticity. The null hypothesis (H_0: no constant variance - homoscedastic) and alternative hypothesis (H_1: constant variance - heteroscedastic) were tested in this study. The decision rule is to accept the null hypothesis if the p-value is above 0.05 or reject it if the p-value is less than 0.05. Table 11 presents the Heteroskedasticity test result and it shows that the probability of F-statistic is above 0.05. Thus, we fail to reject the null hypothesis and accept that our model is homoscedastic, meaning that the variance of the errors is constant across different values of the independent variables.

Table 11: Breusch-Pagan-Godfrey Heteroskedasticity Test Result

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.852869	Prob. F(17,11)	0.1501
Obs*R-squared	21.49390	Prob. Chi-Square(17)	0.2050
Scaled explained SS	3.479986	Prob. Chi-Square(17)	0.9998

Source: Author's Computation (Eviews 9)

4.9 Findings

From the Auto Regressive Distributed Lag Model estimation and Bound Test estimation, there is a short run and a long run relationship between savings, investment and economic growth in Nigeria. Specifically, the ARDL short run results reveal that: investment (INV) has a negative but statistically significant relationship with economic growth (GDP) in the short run; and national savings rate (NSR) in lag 2 has a positive and statistically significant relationship with GDP in the short run. Exchange rate (EXCR) and interest rate (INTR) have positive and statistically significant relationship with GDP in the short run. Additionally, while inflation (INFR) indicates a negative and statistically significant relationship with economic growth (GDP) in the short run, Labour force participation rate (LAB) indicates a positive and statistically insignificant relationship with GDP.

The ARDL long run model result shows that while investment (INV) has a negative and statistically significant relationship with economic growth (GDP), savings rate (NSR) has a positive and statistically insignificant relationship with economic growth (GDP). Inflation rate (INFR) has negative and significant relationship with economic growth (GDP) while exchange rate (EXCR) has positive and statistically insignificant relationship with economic growth (GDP) in the long run. On the contrary, interest rate (INTR) and labour force participation rate (LAB) both have positive and statistically insignificant relationship with economic growth (GDP).

Additionally, the error correction term CointEq(-1) in the model has the expected sign (that is, negative) and significant at 5% probability level. The existence of a long run relationship among the variables under study is validated by this result. The ECM result revealed that about 68.9% of the short run disequilibrium and inconsistency are being corrected and adjusted into the long run equilibrium path. Furthermore, the Granger Causality Test revealed that there is no causal relationship between savings (NSR) and economic growth (GDP) as well as none between investment (INV) and economic growth (GDP).

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4.10 Discussion of Findings

From the short run analysis, we observed that exchange rate (EXCR) had a statistically insignificant effect on economic growth (GDP) implying that a 1% change in EXCR will cause GDP to decrease by 0.7%. Inflation (INFR) has an inverse relationship on economic growth (GDP) which implies that a unit change in INFR will cause GDP to decrease by 37% and its statistically significant in the study. Interest rate (INTR) indicated a positive relationship with GDP, implying that a unit change in INTR will increase GDP by 22%. This implies that the government and policy makers can use interest paid on savings as a catalyst to encourage savings among individuals. National saving rate (NSR) shows a positive relationship with GDP. Implying that a unit change in NSR will increase GDP by 10%. This shows a strong relationship between savings and economic growth and the need for government and policy makers to formulate policies that will encourage individuals to save and these savings (demand deposits) could be used as investment funds for prospective investors. The value of R square (0.999332) and Adjusted R square (0.889225) implies that 88% of the dependent variable (GDP) is explained by the independent variables.

Similarly, in the long run analysis (Bound Test) the F-statistics value (4.393489) is greater than the values of the upper bound and lower bound at 5% significance level (3.61 and 2.45 respectively). Implying that there is a long run relationship between variables. The error correction term in absolute terms (0.689822) represent the speed of adjustment. The value indicates about 68.9% of the short run disequilibrium and inconsistency are being corrected and adjusted into the long run equilibrium path. Comparing the causality between savings (NSR), investment (INV) and economic growth (GDP), the study further revealed that there is no causal relationship between savings, investment and economic growth.

The study revealed that increase in national savings rate (NSR) will to a large extent affect economic growth (GDP) positively in any developing economy such as Nigerian economy. This is based on the fact that the amount of savings in any economy influences capital accumulation and determines the stock of capital which ultimately influences the productive capacity and output growth in an economy. Thus, if government and policy makers should formulate and implement policies that will encourage individuals to save using indicators such as interest rate, individuals will begin to save more since the interest on savings is attractive as well demand for loanable funds for investment.

The study further revealed that investment (INV) has an inverse relationship with GDP. This could be due to the fact that overtime, investment expenditure in productive sectors may have been insufficient overtime. It could also imply that investment expenditure may not have been sufficiently directed to the productive sector as such could not spur output growth. Thus, the government need to look into reviving the activities in the productive sector as this will enhance sustainable growth in the economy.

Similarly, the study also revealed an inverse relationship between inflation (INFR) and economic growth (GDP) both in the long run and in the short run analysis. This implies that inflation should be managed and brought to its lowest possible rate or single-digit rates since it negatively affects economic growth both in the short run and in the long run. There is need for government and policy makers to formulate and implement policies that will help effectively manage inflationary pressures in the economy.

4.11 Policy Implication of Findings

The ARDL results offer important insights into the policy implications for government and relevant authorities in Nigeria. Given the positive and significant relationship between savings and economic growth, government and policy makers should formulate and implement policies that will encourage savings and enhance savings culture among individuals within the economy. The monetary authorities, commercial banks and other financial institutions should increase interest rate on savings to attract individuals to save.

Furthermore, given the negative and statistically significant relationship between investment and economic growth, investment expenditures should be prioritized, promoted and encouraged. Investment spending should be strategically channeled to the real sector to boost output growth. Monetary policies should be regulated such that it will encourage investment expenditure which will translate to economic growth both in the long run and in the short run. The government and policy makers should implement policies and create a conducive and business-friendly environment that will attract investors by providing critical infrastructure and basic amenities that will encourage investments in the economy.

Inflation has a negative effect on economic growth, thus, there is need for government and policy makers to formulate and implement policies that will help to reduce the inflationary pressures in the economy. Similarly, exchange rate and interest rate could be used as tool to encourage investment expenditure which could translate into economic growth within the Nigerian economy. The labour force should be continuously developed, trained and effectively engaged to increase the productivity levels optimize their efforts.

5.0 SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Summary

This study examined the relationship between Savings, Investment and Economic Growth in Nigeria using time series data covering the period of 1990 to 2020. Specifically, the study examined: the effects of gross domestic savings on economic growth; and the effects of gross domestic investment on economic growth in Nigeria. It investigated the existence of a long run relationship between Savings, Investment and Economic Growth in Nigeria and as well examined the causal relationship among Savings, Investment and Economic Growth in Nigeria. The study employed Autoregressive Distributed Lag (ARDL) model to examine the long run relationship existing among the variables. The ARDL long-run bounds test established the existence of long run effects of savings and investment on economic growth in Nigeria.

Specifically, the ARDL long and short run model tests reveal that: savings (NSR) has a positive and statistically significant relationship with economic growth (GDP) in the short run and in the long run. On the contrary, investment (INV) has a negative and statistically significant relationship with economic growth (GDP) in the short run and in the long run. Additionally, in the short run and long run, inflation rate (INFR) has negative relationship with economic growth (GDP) while exchange rate (EXCR), interest rate (INTR) and labour force participation rate (LAB) have positive relationship with economic growth. Furthermore, the ECM result revealed that about 68.9% of the short run disequilibrium and inconsistency are being corrected and adjusted into the long run equilibrium path. The Granger Causality test revealed that there is no causal relationship between savings (NSR) and economic growth (GDP) as well as none between investment (INV) and economic growth (GDP).

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5.2 Conclusion and Recommendations

Savings and investment play a vital role in the growth of any developing economy such as the Nigerian economy. This study examined the relationship between Savings, Investment and Economic Growth in Nigeria using ARDL estimation method. The study revealed that savings will affects the economy positively both in the long run and in the short run. It could serve as a tool for boosting output growth in the economy. However, the need to foster a sustainable savings culture and prioritize investments especially in the real sector remains an imperative for sustainable economic growth and development.

Based on the findings of this study, the policy recommendations are necessary. Government and policy makers should formulate and implement policies that will encourage savings and enhance the savings culture among individuals within the economy. The monetary authorities, commercial banks and other financial institutions should increase interest rate on savings to attract individuals to save. Investment expenditures should be prioritized, promoted and encouraged. Investment spending should be strategically channeled to the real sector to boost output growth. Monetary policies should be regulated such that it will encourage investment expenditure which will translate to economic growth.

Government and policy makers should implement policies and create a conducive and business-friendly environment that will attract investors. Provision of critical infrastructure and basic amenities can also encourage investments in the economy. Furthermore, government and policy makers should formulate and implement policies that will help to reduce the inflationary pressures in the economy. Exchange rate and interest rates should be closely monitored and effectively managed to minimize its adverse effects on economic growth. The labour force should be continuously developed, trained, effectively engaged and managed to positively influence labour productivity levels and optimize their efforts.

This study has contributed significantly to the existing body of knowledge through its findings as it helps to advance the frontiers of knowledge. However, there is still room for further studies. Therefore, we suggest that researchers in related fields embark on research activities to determine the threshold or optimal levels of savings, investment and economic growth in Nigeria.

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