Demand Deposits and Economic Growth: A Time Series Evidence from Nigeria

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Abstract
This study examined the effect of demand deposit on the growth of Nigeria economy using time series data from 1994-2019. Data were sourced from Central Banks of Nigeria Statistical Bulletin real gross domestic product was modeled as the function of Private sector demand deposit; State government demand deposit and Local government demand deposit. Ordinary Least Squares Regression was employed to reveal potential relationships between causes and effects of the independent variables on the dependent variable. The study found that 99% of changes in Real Gross Domestic Product can be explained by the independent variables. The overall significance of the model was proven by the F-statistic of 421.3616 with a p-value of 0.0000. The Durbin Watson statistic (1.718526) was within the acceptance threshold indicates that the dataset does not exhibit autocorrelation characteristic and were suitable for analysis. Findings further revealed that 68% per correction speed from the ECM period (1 year). With a p-value of 0.0.0000 for LNPSDD, the Null hypothesis of no significant relationship between LNPSDD and LNRGDP was rejected while those of LNSGDD and LNLGDD with p-values of 0.7083 and 0.7730 respectively are accepted as their p-values are higher than the Alpha value of 0.05. From the findings, the study concludes significant effect of demand deposits on Nigeria economic growth. It recommends that that government should encourage aggressive mobilization of demand deposits by financial institutions which if effectively channeled towards credit creation will increase financial sector contribution to gross domestic product.

Keywords: *Demand Deposits, Economic Growth, Private Sector Deposit, State Government Deposit, Local Government Deposit*

INTRODUCTION

Money as a medium of exchange can be traced to the barter system era. Due to the problem of double coincidence of want created by the barter system, there was urgent need for a standard and convenient medium of exchange. The first medium of exchange satisfying these conditions evolved during the metallic standard era. Currency in the form of coin minted from precious metals such as gold and silver began to circulate. The monetary standard was in two broad categories namely Commodity or Metallic standard and Paper or Fiat standard. Under the metallic standard, the monetary unit is related to one or more metals. In monometallism, a country operated either the gold or the silver standard. A bimetallic country operated both gold and the silver standards whereby units of silver are related to units of gold by a defined proportion called the mint ratio. It is a monetary arrangement where gold and silver coins circulated freely and a fixed mint weight ratio existing between them. Where there are more than two metals in terms of which monetary units are expressed, the monetary standard is symmetallism. It is a monetary unit redeemable in gold and silver in specified ratio to one another. Gold standard under monometallism system has been adjudged to be the best as it provided stability of exchange rate and prices thereby checkmating inflation, inspired public confidence and encouraged international trade. However, it was criticized for its rigidity. It only achieved exchange stability at the expense of economic stability. Rigid gold standard limited economic expansion, employment and income growth.

It is a unique liability of deposit money banks. An aggregation of demand deposit of the banking system indicates what the deposit money banks of a country owe the non-bank public on demand. The amounts deposited in this account is payable to the depositors on demand. In many countries the account does not earn any interest or attracts at best a token interest. There are no restrictions on the number of transactions or withdrawals as in savings deposit account. A demand deposit account holder could make many withdrawals in a day so long as withdrawals are within the limit of the demand deposit account of the holder. The account can be in debit if an overdraft facility is granted to the customer.

There exists lack of harmony between monetary and fiscal policies resulting in excessive money supply and inflation with adverse consequences on prices and investment. According to Central Bank of Nigeria (2018) huge public spending by the three tiers of government over the years had adversely affected monetary management resulting in the missing of monetary targets by wide margins and has induced serious pressure on the general price level. According to Central Bank of Nigeria (2012) broad money supply grows faster than the RGDP. When money supply exceeds the level the economy can efficiently absorb, it dislodges the stability of the price system, leading to inflation or higher prices of goods. In Nigeria, this has led to double-digit inflation in most years in the past decade. Furthermore, Nigeria being a cash-based economy, cash outside the banking system held by the informal sector and other economic agents constitute a large quantum not adequately controlled by the monetary authorities thereby contributing to price instability. From the above, this study examined effect of saving deposits on the growth of Nigeria economy.

LITERATURE REVIEW

Demand Deposit

It is a unique liability of deposit money banks. An aggregation of demand deposit of the banking system indicates what the deposit money banks of a country owe the non-bank public on demand. The amounts deposited in this account is payable to the depositors on demand. In many countries the account does not earn any interest or attracts at best a token interest. There are no restrictions on the number of transactions or withdrawals as in savings deposit account. A demand deposit account holder could make many withdrawals in a day so long as withdrawals are within the limit of the demand deposit account of the holder. The account can be in debit if an overdraft facility is granted to the customer. The account holder is obliged to charges and commission to the bank for the use of the platform. A most volatile of all the deposit accounts, it constitutes the base for new credit money generation in the banking system. Demand deposits of the commercial banks are the outcome of the public deposits with the banks, and bank loans, advances and investments.

Economic Growth

Economic growth refers to a sustained and positive change in the level of aggregate production of goods and services (Gross Domestic Product) by a country over a given period of time. Gross Domestic Product, also referred to as national income, and represents the total Naira value of all goods and services produced over a specific period usually a year. It measures the size of the economy in monetary terms (Anyanwu, Offor, Adesoye, & Ibekwe, 2013). Uwakaeme (2017) defined Gross Domestic Product as the money value of goods and services produced in an economy during a period of time irrespective of the nationality of the people who produce the goods and services. According to OECD (2014) Gross Domestic Product is an aggregate measure of production equal to the sum of the gross values added of all resident institutional units engaged in production (plus taxes minus any subsidies on products not included in the value of their output).

The calculation of GDP can be done in one of the two ways: either by adding up what everyone earned in a year (income approach), or by adding up what everyone spent (expenditure approach). Invariably, both measures should arrive at roughly the same total. The income approach is calculated by adding up total compensation of employees, gross profits for incorporated and non-incorporate firms and taxes less any subsidies. On the other hand, the Keynesian expenditure method is the more common approach and is calculated by adding total consumption, investment, government spending and net exports. When nominal (GDP) income is deflated with the appropriate of inflation, Gross Domestic Product or real income is obtained. Nominal GDP represent values of output measured at current prices without correcting for inflation. The real gross domestic product (real output) is essentially a measure of the health and wealth of an economy (Usoro, 2018). According to Usoro (2018) Nigerian real output is an aggregation of sectors that have significant contributions to the growth of the nation's economy. These sectors include: agriculture, industries, building & construction, wholesale/retail trade, and services (CBN, 1992).

Real Gross Domestic Product is therefore viewed as inflation-adjusted measure that reflects the real value of goods and services produced in a given period, expressed in base year prices. It is

vital to note that the growth of real output (GDP) of a nation is synonymous with the changes that take place in its economy. However, these changes which can be the success of the economy are largely dependent on the efficacy of monetary policy framework, and achieving this success requires some ability to peep into the near future. Consequently, decision makers must make forecasts to help them in decision making. To conduct these forecasts, most central banks take a number of variables into account (Feridun, & Adebiyi, 2005). For the purpose of this study, Real Gross Domestic Product constitutes the main aspect of the investigation.

The Classical Production Function

This theory states that the amount of output (product) would increase at a diminishing rate when combined doses of labor and capital were applied to given piece of land (Maltus & West, 1815). The concept of production functions is the basis for certain theories in the functional distribution of the income. The concept of production function, its development and refinement grew out of economics maybe due to the nature of production function which is very useful in estimating, analyzing and planning for economic growth, development and acceleration of increase in the national production from the given resources. The values of the production coefficients serve as the basis for determining the optimum patterns of the output.

Production functions may be broadly defined as the technological relationships between inputs and outputs. The inputs are what the firm buys such as productive resources and outputs are what the firms sell. Production is defined as producing goods which satisfy some human want. Production is a sequence of technical processes requiring either directly or indirectly the mental and physical skill of craftsman and consists of changing the shape, size and properties of materials and finally converting them into more useful items or articles. Production function expresses a functional relationship between quantities of inputs and outputs. It shows how and to what extent output changes with variations in input during a specified period of time. According (Solow & Swan, 1956).The production function is the name given to the relationship between rates of input of productive services and the rate of output of product. It is the economists' summary of technical knowledge".

Algebraically, it may be expressed in the form of an equation as

$$Q = f(L, M, N, K, T) \quad (1)$$

Where Q stands for the output of a good per unit of time,

L stands for labor, M stands for Management (or Organization), N stands for Land (or natural resources), K stands for capital and T stands for given technology, f stands for the functional relational relationship. Economists prefer a two input production function to avoid spurious result. In this study, we shall take three inputs: Land, Labor and Capital. The production function in this situation shall assume the form Q = f (L, L, K). In the short run, the technical condition of production is so rigid that the various inputs used to produce a given output are in fixed proportions. However, in the short run, it is possible to increase the quantities of one input while keeping the quantities of other inputs constant in order to have more output. This aspect of the production function is known as the Law of variables proportions. The short run production

function in the case of three inputs, Land, Labour and Capital with Land and Capital as fixed and Labour as the variable input can be expressed as Q= f (L, L, K) where L and K refer to the fixed inputs.

In the long run, all inputs are variable. Production can be increased by changing one or more inputs. The firm can change its plants or scale of production. In the long run, it is possible for a firm to change all inputs up or down in accordance with its scale. This production function is known as return to scale. The return to scale is constant when output increases in the same proportion as the increase in the quantities of inputs. The returns to scale are increasing when the increase in output is more than the proportional to the increase in inputs. They are decreasing if the increase in output is less than proportional to the increase in inputs. In conclusion, the production function exhibits technological relationships between physical inputs and outputs. The function of management is to sort out the right type of combination of inputs for the quantity of output the firm desires. The management has to know the prices of the inputs and techniques to be used for producing a specified output within a specified period of time.

The Classical Neutrality Theory of Money

An Austrian economist, Friedrich Hayek (1931) was the first to coin the phrase 'neutrality of money'. Later neoclassical and neo-Keynesian economists adopted the phrase and applied it to their general equilibrium frameworks, giving it its current meaning. The theory states that an increase in money supply does not affect economic output.

Money can only be neutral in the short run but not in the long run as it loses its neutrality as fresh (additional) money is injected into the growing and dynamic economy. A situation of money neutrality is said to exist when the economy is in equilibrium without monetary gaps but in non-neutrality when the economy is in disequilibrium. Based on the early exchange economists' understanding of money as a veil in which it only assisted in the determination of the quantity of goods and services to be traded and their corresponding prices but has no long term role to play. However, in the early colonial era, money may have performed a neutral role due to scarcity of foreign coins for trading purposes and for administration and labour payment only. With the rapid expansion of banks into Africa capable of creating bank credit money, it has long lost its classical characteristic of neutrality. With the existence of inflation in global economies from demand and supply gaps, neutrality can be maintained as hardly in any economy of today where the neutrality theory of money is evident.

In further refinement of the Fisherian version of monetary theory, some economists concluded that money can affect monetary or nominal variables like money wages, nominal interest rates, nominal output but not real variables like the level of real output and employment. Friedman, M. and Schwartz **(**1963) in an attempt to distinguish the short run and long run effects of money on output believed that a decrease in money stock in the short run initially reduces the level of output which later have impact on prices without any real effect on output. They went further to say that in the long run, money is neutral while in the short run changes in money stock can and do have significant impact on real output.

Classical school believed that every monetary standard served only as a medium of exchange and had no influence whatsoever on economic aggregates such as income, consumption, savings and employment. They never foresaw gold standard (the preferred payment medium due to its high intrinsic value and easiness of carriage) could cause possible increase in prices capable of distorting macroeconomic variables. They argued that gold mines were drying up while economic output was increasing and as such there were no chances of supplying excess gold which could increase prices and affect economic output. They never envisaged 'paper currency standard' and bank credit system which are inflation-prone capable of raising prices beyond their comprehension. However, Keynes finally countered the Neutrality concept of the classical school. He asserted that money was an integral part of the economic process and influences real economic aggregates. The theory of inflation, an anti-thesis of the neutrality theory of money concept has finally put paid to the relevance of the theory for today's macroeconomic analysis. According to the classical economists, changes in the nominal money supply would leave the equilibrium value of the real variable unchanged. The relevance of this theory to the study is that at equilibrium, money stock equals total output and in line with the model equation:

RGDP = f(COB, DD SD, TD, FCD) (2)

and at this point money is neutral. A number of approaches have attempted to define money and the compositions of a country's money stock. Three approaches have been distinguished, namely, the Traditional approach, the Chicago approach, the Gurley and Shaw approach [124].

Neo-classical Growth Model

This model asserted that an economy's growth rate is dependent on two factors: the level of saving and productivity of capital or the capital per output ratio (Banam, 2010). According to (Solow & Swan, 1956) economic growth is the result of three factors – labour, capital, and technology. The Solow-Swan model attempts to explain long-run economic growth by looking at capital accumulation, labour or population growth and increase in productivity commonly referred to as technological progress. The growth theory explains long-run economic growth by looking at productivity, capital accumulation, population growth and technological progress (Solow & Swan, 1956).

Though the main work on neo-classical growth theory model was done by Robert and Trevor in 1956 and was extended and expanded by Solow who adds labour as a factor of production and making capital labour ratios flexible unlike in the Harrod-Dommar model where they are fixed. According to Mankiw (2003), the Solow growth model shows how an increase in capital and labour force and advancement in technology can influence entire economic growth and development. The model specification is that output is a function of capital and labour that is

V=f (K, L) (3)

Where V = output, K = capital and L = Labour.

Some of the assumptions of the models are:

i. All savings in the economy are channeled to investment opportunities and augmentation of physical capital stock (Ibi, Basil & Ojong, 2019)
ii. Depreciation of capital rate is assumed to be zero.
iii. No technical progress.
iv. Population growth rate assumed to be fixed.

The summary of the Solow growth model shows that an increase in output is dependent on a higher rate of savings via higher stock of capital (Mankiw, 2003). The model indicates that a long run increase in labour will reduce the level of output if there is no improvement in technological progress that will enhance the efficiency of labour. The theory therefore concludes that the long run equilibrium growth rate depends on two exogenous variables: the rate of population growth and rate of technological change (Froyen, 2007). He went further to posit that the theory provides little reference to the importance of finance in economic growth other than making reference to savings which does not affect the growth at long run. This theory has bearing to the study because financial development comes in form of technical innovations into the financial system that spurs growth of the system and enhances services to the economy and agricultural sector in particular. Thus the theory posits that financial development leads to agricultural output growth.

Traditional Approach

Under this theory, money supply is defined as a medium of exchange which consists of currency in the hands of the public plus demand deposits in commercial banks (Keith & Peter, 2003). To them what constitute the money stock of any country would be those mediums that facilitate readily the exchange mechanism and command general acceptability. It is also called narrow money (M1). Hence, M1=C+DD, where C is currency outside the bank, DD is demand deposit.

The Chicago School

The Chicago economists led by Professor Milton Friedman adopted a broader definition of money and symbolized as M2 and they define money supply as a temporary store of value. Their argument is that since in the economy, money income and spending flow streams are not completely harmonized in time so as to make transaction, money should be temporarily stored as a general purchasing power (Keith & Peter, 2003). Thus, money not only functions as a medium of exchange, but also as a temporary store of purchasing power. By implication, the total money stock must not be restricted to M1 but must include any other asset that command liquidity or near to currency. Money stock or M2=M1+Savings deposits + Time deposit.

Gurley and Shaw Approach

Introducing another dimension to the definition of money and money supply, Professor John G. Gurley and Edwards Shaw defined currency (C) and demand deposits (DD) as claims against financial intermediaries (central bank and commercial banks. According to these economists, there exists a fairly large spectrum of financial assets which are close substitutes for money and symbolized as M3. Therefore, they define. money supply as M2 plus the deposits of all other non-bank financial institutions like savings banks, building societies, loan associations and others expressed as M3 = C + DD + SD + TD + DNBFI (3)

(Keith Band and Peter Howells, 2003)

Empirical Review

Yeshiwas (2021) researched on the impact of broad money supply on Real GDP of Ethiopia. The data used for this study was a time series, (2002-2017), analyzed using Vector Autoregressive model and causality test to check the short causality between broad money supply and Real GDP growth. The result of both tests revealed that broad money supply has positive significant effect on real GDP and statistically significant.

Ibi et al., (2019) researched on the effect of selected macroeconomic variables on money supply in Nigeria. Cointegration test, Granger causality test and Error correction mechanism (ECM) were employed in the estimation of the relevant equations. The short-run and the long-run estimates revealed that income (GDP), credit to the private sector (CPS), net foreign asset (NFA), government expenditure (GEXP), consumer price index (CPI), interest rate (IR) and exchange rate (EXCH), all have both short-run have significant effect on money supply. Furthermore, the results of the granger causality test showed that money supply is endogenously determined in Nigeria; thereby supporting the post-Keynesian postulation that money supply is endogenous. This indicates that macroeconomic variables had greater influence in determining the rate of money growth in Nigeria.

Gnawali (2019) examined the effects of money supply on the economic growth of Nepal over the period 1975 to 2016, using co-integration, Vector Error Correction Model (VECM) and Causality test to conclude. The study showed that money supply is positively significant to economic growth and foreign assistant is negatively significant to the economic growth of Nepal and the study suggests to increase the money supply for achieving higher and rapid economic growth.

Ufoeze, Odimgbe, Ezeabasili and Alajekwu (2018) investigated the effect of monetary policy on economic growth in Nigeria. The natural log of the GDP was used as the dependent variables against the explanatory monetary policy variables: monetary policy rate, money supply, exchange rate, lending rate and investment. The time series data is the market-controlled period covering 1986 to 2016. The study adopted an Ordinary Least Squared technique and also conducted the unit root and co-integration tests. The study showed that long run relationship exists among the variables. In addition, the core finding of this study showed that monetary policy rate, interest rate, and investment have insignificant positive effect on economic growth in Nigeria. Money supply however has significant positive effect on growth in Nigeria. Exchange rate has significant negative effect on GDP in Nigeria. Money supply and investment granger cause economic growth, while economic growth causes interest rate in Nigeria.

Adediyan (2018) conducted a research on the determinants of money supply in Nigeria covering 1980 to 2019, adopting the Autoregressive Distributed Lag (ARDL) approach. Data used for the study were collected from the 2019 CBN Annual Statistical Bulletin. The independent variables were reserve ratio, monetary base, liquidity ratio, currency deposit ratio interest rate while the dependent variable was proxied as broad money supply. The study found that financial liberalization is an important factor in determining money supply in Nigeria, in addition to currency ratio, required reserve ratio and high-powered money.

Ominyi and Inalegwu (2017) adopted the Vector Error Correction Model (VECM) in ascertaining the relationship between gross domestic product (GDP) and private savings (SAV) including other relevant exogenous variables in the model. The results showed a positive relationship between GDP and Savings such that a percent change in Savings would result in an 8.29% change in GDP.

Adeniji, Timilehin and Gamaliel (2017) investigated the long and short run relationships between broad money supply and real aggregate output (GDP) in Nigeria from 1981 to 2015. The study employed an unrestricted version of Mixed Data Sampling (U-MIDAS) and Autoregressive Distributed Lag (ARDL) techniques. The results of U-MIDAS test affirmed existence of a long and short-run relationship between yearly real GDP and quarterly broad money supply at different season while the ARDL result affirmed that money supply impacted significantly on real GDP in the long run only. Furthermore the study revealed disequilibrium correction terms from the two analytical approaches showing evidence that there is a tendency for growth targeting in Nigeria which is one of the major objectives of Nigeria economy though at a slower rate.

Literature Gap

From the empirical studies, some major gaps in literature were observed. A model gap was observed as previous studies concentrated on aggregate broad money supply like Adeniji, at el., 2017; Khobai & Dingela, 2017; Chude & Chude, 2016). In this research, disaggregated broad money supply components are employed. A disaggregation of money supply components into micro components are likely to capture the cyclical factors that drive the economy and their dynamics and paint a better picture of the relationship between money supply and the economy in the long run.

Some of the reviewed studies were carried out in other countries outside Nigeria as seen in (Tuyishime , Memba, & Mbera, 2015; Pitoňáková, 2016); Aslam, 2011). As the countries studied operate under different legal and economic environments, this constitutes a location gap.

There exists conflicts and in some cases inconclusiveness in research findings due to methodogies, estimation tools, variables and other analytical tools used. Some of the studies found positive relationship between money supply and economic growth (Ogunmuyiwa, & Ekone, 2010); Chinwuba, Akhor & Akwaden, 2015); Ifionu, & Akinpelumi, 2015). However, some other studies found negative impact of money supply on economic growth (Suleiman, 2010); Amassona, Nwosa, & Olaiya, 2011; Ehigiamosoe, 2013). Also, some of the reviewed studies used inappropriate estimation tools while some failed to evidently carry out diagnostic tests to ascertain the integrity of the data in line with the Classical Regression Linear Model Assumptions as observed in (Suleiman, 2010, Michael, & Ebibai, 2014; Adefeso, & Mobolaji, 2010).) providing gap in estimation tools. This study focused on demand deposit and Nigeria economic growth.

METHODOLOGY

Research Design

This study adopted *ex-post facto* design to determine the impact of broad money supply on the Nigerian economy. *Ex-post facto* design is a systematic empirical inquiry in which the investigator has no direct control over the values of the variables applied for the study (Kerlinger, 1971). The

preference for this design is influenced by the nature of the data to be processed which for this study is time series. Time series secondary dataset covering the period, 1994 to 2019, was obtained from CBN Statistical Bulletin (various issues). The following data were sourced: Currency in circulation, Demand deposit, Savings deposit, Time deposit, and Foreign currency deposit they are the independent variables while the dependent variable is the Real Gross Domestic Product (RGDP).

Model Specification

Irving Fisher's Quantity Theory of Money is adopted for this study. According to the theory, MV = PT, where M represents money stock, V as velocity of money, P as price level while T represents volume of transactions. It expresses the relationship existing between money, price and output. While MV represents total spending, PT represents what is purchased. Hence, the model of this study consists of the dependent variable, RGDP, and the independent variables consisting of broad money supply components. It is therefore hypothesized that real gross domestic product in Nigeria is a function of the independent variables (components of broad money supply).

Functionally the relationship between RGDP and DD is expressed as follows:

RGDP = f(DD) (5)

RGDP = f(PSDD, SGDD, LGDD) (6)

Where PSDD = Private sector demand deposit; SGDD = State government demand deposit; LGDD = Local government demand deposit

The econometric model is presented thus:

$RGDP = b_0 + b_1PSDD + b_2SGDD + b_3LGDD + U_t$ (7)

The model in the log linear form can be expressed as:

$LnRGDP = bo + b_1lnPSDD + b_2lnSGDD + b3lnLGDD + ut$ …… (8)

b_O is the intercept, b_1-b_3 are coefficients of the baseline explanatory variables and U is the error term representing the unobserved factors which influence the dependent variables. The *a priori* expectations are b_1-b_3>0

Descriptive Statistics

Descriptive statistics are introductory statements which describe, summarize and arrange the time series data in a manner that it could be easily understood at a glance. Quantitative measures such as the mode, mean, median, maximum, minimum, standard deviation, skewness, kurtosis, Jarque Bera statistics and probability, sum and sum square deviation and number of observations are applied in the descriptive statistics. Descriptive statistics summarizes the basic characteristics of the data set applied for the study. It presents the data as it is while inferential statistics go to analyze the data and infer some conclusions. The mean is the average value of the series obtained by adding up the series and dividing it by the number of observations. The median is the middle value (or average of the two middle values) of the series when the values are arranged from the smallest to

the largest. The median is a robust measure of the centre of the distribution which is less sensitive to outliers than the mean. Standard deviation is a measure of dispersion or spread in the series. A standard deviation greater than one (1) invalidates the assumption of normality considered crucial for OLS regression analysis. Skewness is a measure of asymmetry of the distribution of the series around its mean. Kurtosis measures the peakiness or flatness of the distribution of the series. If the kurtosis exceeds 3, the distribution is peaked (leptokurtic) relative to the normal but if the kurtosis is less than 3, the distribution is flat (platykurtic) relative to the normal. Data that come from normal distribution should have a skew equal to zero (0) and kurtosis equal to three (3). Jacque-Bera is a test statistic for testing whether the series is normally distributed. The null hypothesis is that the variables are not normally distributed. The decision rule is to reject when p-value is less than 0.05 level of significance.

Stationarity Test

Stationarity test has to be carried out on the data first to determine whether or not the time series data were stationary. Multiple regression analysis with non-stationary data could yield spurious regression results. If a time series data are stationary, it means time series data and the auto covariance at various lags remain constant over time.Thus, test for stationarity is also called test for integration. It is also called unit root test. Stationarity denotes the non-existence of unit root. (Omotor & Gbosi, 2007) various methods are available for testing the stationarity condition of series. The most widely used are: (1) Dickey-Fuller (DF) test; (2) Augmented Dickey-Fuller (ADF) test; and (3) Philip Perron (PP) test. The ADF test which is very widely used was applied for this study.

Augmented Dickey Fuller (ADF) Test

The ADF technique tests the null variables of the model for non stationarity or for the presence of unit root.

Ho: The time series is non-stationary (i.e there is unit root).

Decision Rule

$$t\text{-}ADF_{(absolute\ value)} > t\text{-}ADF_{(critical\ value)} : \text{Reject } H_o \quad (9)$$

Note that each variable based on its own ADF test value, if the variable was stationary at level, then it was integrated of order zero i.e 1(0). Note that the appropriate degree of freedom was used. If the variables were stationary at level, it means that even in the short run they move together. The unit root problem earlier mentioned can be explained using the model:

$$Y_i = Y_{t-1} + \mu_1 \quad (10)$$

Where Y_t is the variable in question; μ_1 is stochastic error term.

Equation (a) is termed first order regression because we regress the value Y at time "t" on its value at time (t-l). If the coefficient of Yt-l is equal to l, then we have a unit root problem (non-stationary situation). This means that if the regression

$Y_t = L\ Y_{t-l} + \mu_1$ (11)

is solved and L (lag time) is found to be equal to l then the variables Y_t has a unit root (random work in time s cxeries econometrics).

If a time series has a unit root, the first difference of such time series are usually stationary. Therefore to solve the problem, take the first difference of the time series. The first difference operation is shown in the following model.

$\Delta Y_i=(L-l)\ Y_{t-l} +\mu_t$ (12)

$\_\_Y_{t-l}+\mu_t$ (13)

(Note: = l-l=0; Where L = l; $\hat{Y}t= Yt - Y_{t-l}$) (14)

Integrated of order 1 or1 (1)

If the original (random walk) series is differenced once and the differenced series becomes stationary, the original series is said to be integrated of order 1(1).

Integrated of Order 2 or 1(2)

If the original series is differenced twice before it becomes stationary (i.e. the first difference of the first difference), then the original series is integrated or order 2 or 1 (2). Therefore if a time series has to be differenced Q times before becoming stationary it said to be integrated of order Q or 1(q).

We shall test the stationarity of our data using the ADF test.

Regression Analysis

Regression analyses is basically concerned with the study of the dependence of one variable (dependent variable) on one or more other explanatory or independent variables (regressors) with a view to finding out or estimating/predicting the mean or average value of the former in terms of known or repeated values of the latter (Gujarati, 2003). In specific terms, regression analyses explain the variation in an outcome (dependent variable) Y, as it depends on a predictive (independent/explanatory variable) X, it is a correlation-based test. Correlation is one of the most common and useful statistics. It describes the degree of relationship between two variables. The rule of thumb is to use OLS when the result of stationarity test is in the order1 (0) or 1(1), while ARDL should be employed if it is a case of mixed order but not in the order 1(2). This study adopted both OLS and ARDL testing techniques based on the result of the unit root test.

(ii) Autoregressive Distributed Lag (ARDL) Approach

This study employed the Autoregressive Distributed Lag (ARDL) bounds test approach proposed by Pesaran, Shin and Smith (2001) based on unrestricted error correction model. Compared to other co-integration procedures such as (Engle & Granger, 1987) and (Johansen & Juselius, 1990) the bounds test approach appears to have gained popularity in recent times for a number of reasons. First, the endogeneity problems and inability to test hypotheses on the limited coefficients in the

long run associated with Engle-Granger method are avoided, that is, it has superior statistical properties on small samples as it is relatively more efficient in small sample data sizes evident in most developing countries. Second, the long run and short run parameters of the model are estimated simultaneously. Third, all the variables are assumed to be endogenous. Fourth, it does not require unit root testing usually employed to determine the order of integration of variables. Lastly, whereas all the other methods require that the variables in a time series regression are integrated of order one, *I*(1), only that of (Pesaran et al., 2001) could be used regardless of whether the underlying variables are *I*(0), *I*(1).

In order to test the existence of long run relationship between Real Gross Domestic Product and money supply variables, a bound test is conducted. Nonetheless, to apply the bounds test, it is important to ensure that the variables under consideration are of mixed order of stationarity and not integrated at an order higher than one. In the presence of *I*(2) variables, the critical values provided by Pesaran, Shin, and Smith (2001) are no longer valid.

Diagnostic/Reliability Checks

This is an important stage in the analysis of the study because it validates the parameter estimating outcomes achieved by the estimated model such as residual autocorrlation and normality among others. Some of these tests are briefly discussed as follows:

(i) Jarque-Bera Normality Test: The residual normality test was used in the study. It is the multivariate extension of the Jarque-Bera normality test

(ii) Normality test usually combines both skewness and kurtosis of the sample data to see if the combination matches a normal distribution with aa skew equal to zero (0) and kurtosis equal to three (3). If the sample data possesses these two properties, it will be concluded that the data came from normal distribution and therefore valid for linear regression analysis. If Jarque-Bera = 1 or higher (JB>1), the null hypothesis (Ho) of normality of data or normal distribution of data is rejected. If JB =0, the data is concluded to be perfectly and normally distributed around the mean and qualifies for linear regression analysis. The data is assumed to have passed the normality test. The normality of data can also be determined from the probability value (p-v), if the computed or the actual p-v <0.05 (that is less than the Alpha significant value of 0.05 or equal to it) then, it is a strong evidence that the Null hypothesis of normality of data was invalid and should be rejected. If p-value >0.05 then the alternative hypothesis then has to be accepted. The p-value rejects or accepts the Null hypothesis of normality of data. The smaller the p-value is from the Alpha significant value of 0.05, the stronger the evidence that Null hypothesis of normality of data should be rejected.

(iii) Breusol Godfrey Serial Correlation LM Test: The Langrange Multiplier (LM) test was used in this study since it is a multivariate test statistic for residual serial correlation up to the specified lag order.

(iv) White heteroskedasticity Test: This test, proposed by Halbert White (1980), is a statistical test used to establish the differing variances of the error term in a time series data set. Heteroskedasticity arises most often with cross-sectional data mainly due to

the presence of outlier in the data. Outlier in heteroskedasticity means that there are observations that are either small or large with respect to the other observations in the sample.

(v) Residuals (Cusum and Cusumsq) Stability Tests: CUSUM and CUSUM of Square tests for parameter stability were first introduced into the Statistics and Econometrics literature by Brown, Durbin and Evans in 1975. Cummulative Sum (CUSUM) and Cummulative Sum of Square (CUSUMSQ) are techniques for testing the constancy of regression relationships over time. CUSUM and the CUSUMSQ tests are tests which are applied to assess parameter stability [102].

Co-integration Test (Johansen's test)

It has already be warned that the regression of a non-stationary time series on another non stationary time series may yield a spurious regression. The important contribution of the concept of unit root, co-integration, etc. is to force us to find if the regression residual are stationary. Thus, a test for co-integration enables us to avoid spurious regression situation. If there are k regressors in a regression model, there will be k co-integrating parameters. Specifically, co-integration means that despite being individual non stationary, a linear combination of two or more time series can be stationary. Thus co-integration of two (or more) time series suggests that there is a long- run or equilibrium relationship between them (Gujarati, 2003). There is a difference between test for unit root and test for co-integration. The former is performed on univariate (i. e single) time series, while the deals with relationships among a group of variables where (unconditionally) each has a unit root.

T-Test

This is a test of significance of the regression coefficients (Gujarati, 2003). Generally speaking, the test-of-significance is a test of statistical hypothesis. A test of significance is a procedure which uses sample results to verify the truth or falsity of a null hypothesis (Ho). T-Test assumes that Ho: $\beta_1 = 0$ (i.e statistically insignificant). Where β_1 = the coefficient of the model. The T-Test results indicate the strenghth (significance) of the coefficients of the variables of the model for prediction purposes.

The t-statistic is inversely related to the standard error. The more the standard error tends towards zero, the higher the t-statistic and the more reliable.

Decision Rule

The decision rule for the T-test of significance is:

$T_{calculated} > t_{(critical\ value)}$: Reject Ho (if otherwise accept H_1)

Note: df=n-k where n=No. of observations

K=No. of parameter estimates

ta/2 =t 0.025

F-test:

F-test tests the overall significance of the models. The F-test determines the overall significance of an estimated model. i.e. it test the goodness of fit of the model (Patterson, & Okafor, 2007). Thus, the f-statistic tests how the overall model fits the relationship between the variables. According to Gujarati (2003) the F-statistic tests the overall significance of a multiple regression.

Decision rule:

Given the k- variable regression model:

$$Yi= \beta_1 + \beta_2 X_{2i}+ \beta_3 x_{3i+\ldots\ldots+} \beta_k \ x_{ki} + \mu_1 \quad (15)$$

To test the hypothesis:

$$Ho: \beta_2= \beta_3=\ldots.= \beta_k=0 \quad (16)$$

(i.e all slope coefficients are simultaneously zero) versus

Hi: not all slope coefficients are simultaneously zero

(Such that if

$F_{cal}>F_{a\ (k-l,\ n-k)}$: Reject Ho (otherwise accept H_1)

Where:

$Fa_{(k-l,\ n-k)}$= critical f value at the level of significance and (k-l) numerator degree of freedom (DF) and (n-k) denominator DF. Alternatively, if the p value of F-cal is sufficiently low, Ho can be rejected.

It should be noted that k is the number of variables (both y and x variables) in the regression. If Ho is accepted it means that the model is not satisfactory or no well specified or not a good fit. On the other hand, if Hi is accepted (i.e. Ho is rejected) it means that the overall significance of the model is good enough. Note that F statistic can be computed thus:

$$F = \frac{ESS/df}{RSS/df} = \frac{ESS/(kl)}{RSS/\ n-k)} \quad 917)$$

Where: ESS=Explained sum of squares; RSS=Residual sum of squares K-l = numerator df; n-k = denominator df; k =No. of variables in the regression.

R^2 (Coefficient of Determination)

R^2 is the multiple coefficient of determination (Gujarati, 2003). It is conceptually akin to r^2 (the same coefficient of determination used for only the two-variable model. R^2 is used where the variables –both Y and X – are more than two. R^2 gives the proportion or percentage of the total variation in the dependent variable y that is accounted for by the single explanatory variable x). Similarly, R^2 gives the proportion of the variation in y explained by the variables X_2 X_3 etc jointly. The higher the R^2 values the better. It lies between 0 and l. If it is l, the fitted regression line

explains any of the variation in Y. If it is 0, the model does not explain any of the variation in Y. The fit of the model is "better" the closer R^2 is to l. (Note that R is the coefficient of multiple correlations, and it measures the degree of association between Y and all the explanatory variables jointly. It is always taken to be positive, but it is of little importance in practice. The more meaningful quantity is R^2). We shall therefore use the R^2 to determine the extent to which variation in economic growth variable is explained by variations in independent variables.

Causality test

Granger causality test is a statistical hypothesis for determining whether one time series is useful for forecasting another. Although correlation regression analysis deals with dependence of one variable on the other, it does not necessarily imply causation in the real sense. A statistical correlation relationship in itself cannot logically imply causation (Kendall, & Stuart, 1961) and Zellner, 1979). Correlation means there is relationship or pattern between the values of the two variables under study in which they can change together while causation means that one event causes another event to occur. According to Gujarati, (2003a) variable say *y* is said to granger cause another variable say *x* if past and present values of *y* help to predict *x*. The traditional Granger Causality (based on a bi-variate relationship) recognizes the following types:

Unidirectional Causality: This is a case where X granger-causes Y or Y granger-causes X but not the reverse in each case. This means the causality either runs from X to Y (X→Y) or from Y to X (Y→X) but without the reverse occurring in each case.

Feedback (Bilateral) Causality: In this case the causality runs on both sides but on the condition that the coefficients of the set (variables) are statistically and significantly different from zero in both cases, that is, (X↔Y) and (X↔Y).

Independence: This is the case where the coefficients of the set (X and Y) are statistically insignificant in both regressions. In this case, neither X granger-cause Y nor Y granger-cause X. Y and X represents the dependent and independent variables respectively. In order to complement this study, a causality test was conducted to establish the direction of causality between money supply variables and real GDP.

The Error Correction Model (ECM)

This test is conducted to ascertain the short run effect of the explanatory variables on the dependent variable Gujarati, (2003) in the study of the path to economic growth, established that the long-run path of economic growth is paved with instabilities caused by economic shocks. The short run shocks create error along the growth trajectory, which have to be corrected. The correction of the errors will take some periods (years). ECM is designed to establish the magnitude of the error created by economic shocks and also determine how long it will take to clear the error on the long run growth path to enable the variables converge once more at an equilibrium point for the economy to continue the long run movement. Therefore the purpose of the ECM test is to calculate the speed of the periodic adjustment of the variables of the model in the match towards long run equilibrium and to determine the number of period (year) it would take the model to achieve long run equilibrium.

Over parameterized Error Correction Model (OPECM)

The over parameterized error correction model was constructed after the existence of long-run relationship between the variables has been established. This is to ascertain that there are no overbloated and insignificant variables with wrong signs which could mislead the model interpretation.

The Parsimonious Error Correction Model (PECM)

The Parsimoniuos Error Correction Model was constructed where the over parameterized ECM was found to be unsuitable for calculating ECM coefficients probably because of over bloated and insignificant variables with wrong signs. The Parsimonious model is a refined model capable of producing the right ECM coefficients and rejecting over bloated and significant variables with wrong signs.

Cholesky Variance Decomposition Test

The main objective of variance decomposition is to determine how economic growth reacts to shocks in any of the variables and to establish which of the variables is relatively the most important and how long, on average, it will take for the economic growth to restore its equilibrium following such shock. The F-tests and an examination of causality in a VAR will show which of the variables in the model has statistically significant impact on the future value of each of the variables in the system.

Impulse Response

Impulse Response Test was developed by Davis and Hertlein (1987). This test method was traditionally used for the integrity assessment of pile foundations. In this study, the essence of impulse-response test is to determine how economy reacts over time to exogenous impulse which economists usually refer to as shocks and is often modeled in the context of a vector auto regression. In the context of this study, impulse-response test is used to measure the impacts of residuals of the model on real GDP one standard deviation shock.

ANALYSIS AND DISCUSSION OF FINDINGS

Table 1: Data of the Descriptive Statistics

	LNRGDP	LNPSDD	LNSGDD	LNLGDD
Mean	10.62796	7.388330	4.448576	2.840218
Median	10.70191	8.029677	5.180746	3.304097
Maximum	11.18988	9.403667	6.753018	5.215914
Minimum	9.902437	4.366786	0.076961	-0.314711
Std. Dev.	0.477069	1.693199	2.088654	1.747717
Skewness	-0.268258	-0.474075	-0.634268	-0.427081
Kurtosis	1.494538	1.765834	2.099657	1.860855
Jarque-Bera	2.979976	2.825843	2.823101	2.365117
Probability	0.225375	0.243431	0.243765	0.306494
Sum	297.5829	206.8732	124.5601	79.52610

Sum Sq. Dev.	6.145063	77.40691	117.7869	82.47185
Observations	28	28	28	28

Source: Author's Eviews10 Output

The descriptive statistics shows that most of the variables exhibited positive mean and positive median which is an indication that the dataset may come from normal distribution. The mean and median of the dataset are near equal confirming the normal distribution of the time series. The maximum value of RGDP in the time series in log form was 11.19units with minimum value of 9.90units. Also, the maximum and minimum values for the other variables were captured. While the skewness captures how variables lean to one side, the kurtosis shows the peakness of distribution. The skewness close to zero and kurtosis also close to 3 except LNLGSD validate the assumption that the dataset came from normal distribution. Jarque-Bera statistic (JB) with most variables showing p.values greater than Alpha value of 0.05 implies a rejection of the Null hypothesis and acceptance of the normal distribution of the time series.

Trend Analyses of Macroeconomic Variables Used in the Study

Real Gross Domestic Product

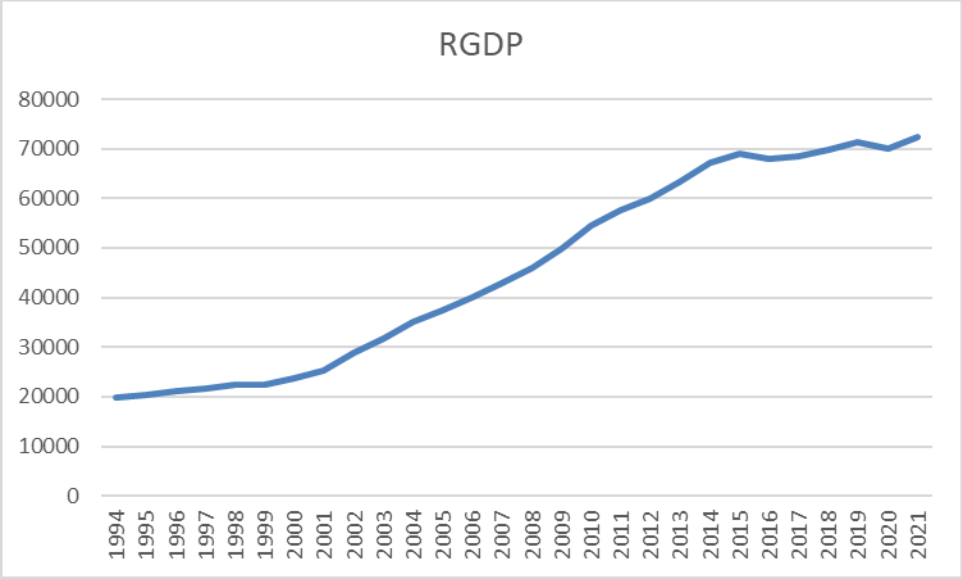

Figure 1: Trends of the Real Gross Domestic Product in N'bn (1994-2021)

Source: E-views10 output

Figure 1 depicts a rising trend of the RGDP. Nigeria's real gross domestic output grew at an average of 5.3 per cent between 1994 to 2002. A steeper growth was observed with the return of democracy era in 1999 despite a dismal performance between 2015 and 2019. The rise in output growth was driven by improved macroeconomic environment, relative stability in the goods and foreign exchange markets and enhanced investor confidence in the economy. RGDP declined by 1.9 per cent between 2019 and 2020 due to the COVID-19 pandemic with lockdown of economic activities. Thereafter from 2020 it grew from N70, 014 billion to N72, 394 billion in 2021 ending the period with a growth rate of 3.4 per cent.

Disaggregated Demand Deposit

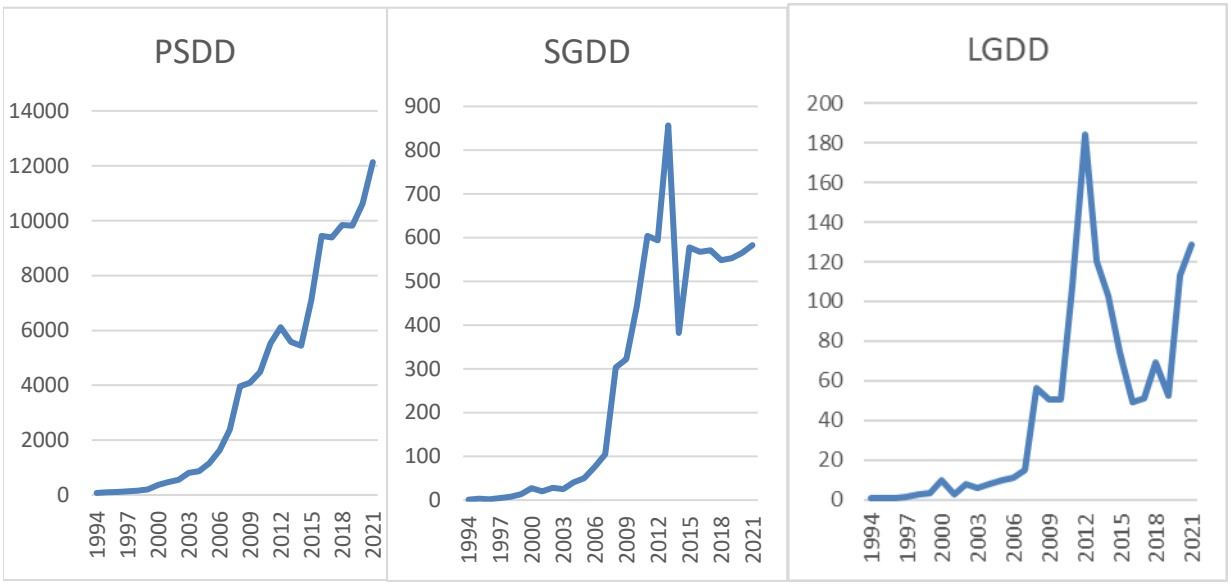

Figure 2: Trends of the Disaggregated Demand Deposits (1994-2021)
Source: E-views10 output

Figure 2 show that Private Sector Demand Deposit (PSDD) recorded a rising trend from N78.79bn in 1994 to N6116.79bn in 2012. It declined by 11.07% to N5439.87bn in 2014 before galloping to N9815.04bn in 2019 closing at N12132.79bn in 2021. State Government Demand Deposit rose from N1.08bn in 1994 to N26.79bn in 2000 but declined to N19.6bn in 2001, and rose again to N25.18bn in 2003 and maintained a steady growth attaining the peak of N856.64bn in 2013 and closed by dropping to N582.70bn in 2021. A rising trend was also recorded by the Local Government Demand Deposit from N0.73bn in 1994 to N9.95bn in 2000. It declined to N2.79bn in 2001. From N8.0bn in 2002, it rose to N15.07bn in 2007 and took a quantum leap to N56.59bn in 2008 reaching its highest peak of N184.18bn in 2012. From 2013 it started to descend with swings and reaching the lowest ebb of N49.18bn in 2016. Another upward trend was recoded fom N51.06bn in 2017 attaining a highest growth to N128.54bn in 2021. The above trend implies that there are some degrees of relationship among the sampled variables which will be tested more empirically in subsequent analyses.

Model Analysis

Table 2: Summary of ADF Unit Root Test

Variable		t-statistic	Critical value	Prob.	Order of Integration
LNRGDP	Level	-1.514410	-2.976263	0.5112	1(1)
	1st Diff	-6.018807	-2.986225	0.0000	
LNPSDD	Level	-2.340887	-2.976263	0.1672	1(1)
	1st Diff	-3.518423	-2.981038	0.0156	
LNSGDD	Level	-2.519670	-2.976263	0.1221	1(1)
	1st Diff	-3.82991	-2.986225	0.0000	
LNLGDD	Level	-1.548894	-2.981038	0.4936	1(1)
	1st Diff	-7.316115	-2.981038	0.0000	

Source: E-views10 output

The results of the unit root test above revealed that all the variables are stationary at 1st difference.

Normality and Reliability Tests

In order to further ascertain that the data for the study fitted well for analysis, we investigated if the data of the residuals of Model II were normally distributed around the mean. The Jarque-Bera Normality test requires that the histogram of the normal distribution of a times series should be bell-shaped.

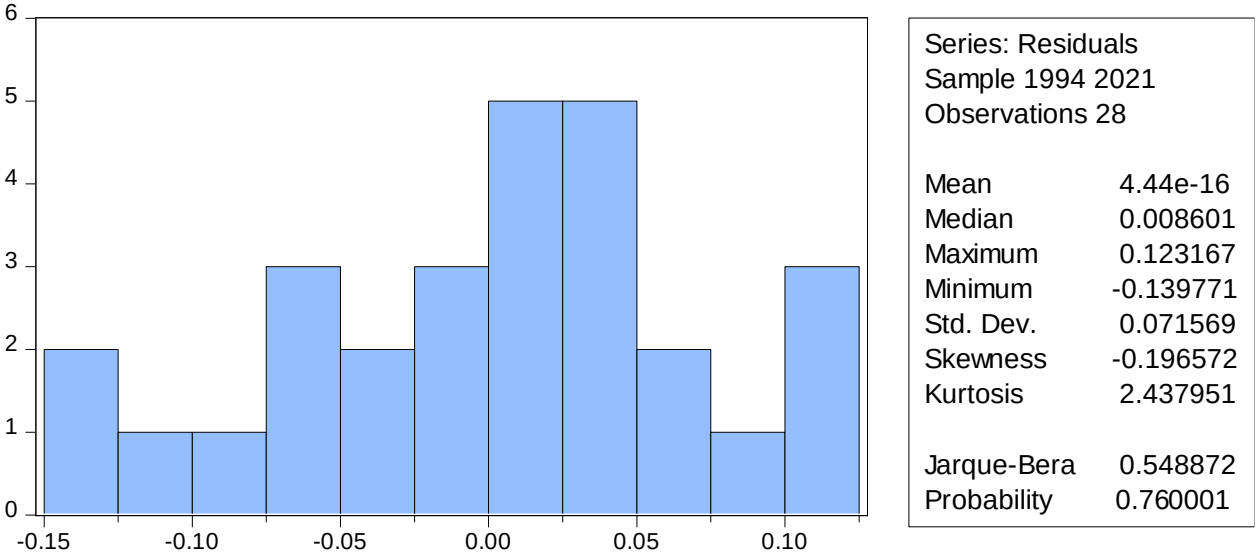

Figure 3: Jarque-Bera Normality Test
Source: E-views10 output

In Figure 3, the Histogram Normality Test indicates skewness and kurtosis of -0.197 and 2.44 respectively. The skewness is nearer to 0.0000 and kurtosis nearer to 3. These results indicate that the dataset was to a large extent distributed around the mean. This is supported by JB statistic of less than 1 (JB<1) with a high probability value of 0.76001. The p-value of 0.76 is greater than the Alpha of 0.05 which means the acceptance of the Alternate hypothesis of Normal distribution of fitted data around the mean. Furthermore, the JB statistic and p-value of 0.55 and 0.76 respectively, suggests that the residuals of the model are normally distributed. When the residuals of a model are normally distributed around the mean then the normality of the main variables are assumed to be normally distributed and need no further testing. The model analysis can proceed once the normal distribution of the residuals has been confirmed.

Table 3: Serial Correlation and Heteroskedasticity Tests (Model II)

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	17.67687	Prob. F(2,2)	0.0635
Obs*R-squared	22.71499	Prob. Chi-Square(2)	0.0690
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	2.370177	Prob. F(19,2)	0.3382
Obs*R-squared	21.06449	Prob. Chi-Square(19)	0.3332
Scaled explained SS	0.132318	Prob. Chi-Square(19)	1.0000

Source: E-views10 outputs

The Null hypothesis of no serial correlation in the model is accepted with p-value of 0.0635 as shown in Table 3 and which is greater than the Alpha value of 0.05. The Null hypothesis of heteroskedasticity is also accepted by the p-value of 0.3382 of Table 3 which is higher than the 0.05 Alpha values. The p-value of 0.3382 accepts the hypothesis of the absence of heteroskedasticity

Table 4: Ramsey Reset Test Result

	Value	Df	Probability
t-statistic	0.276152	1	0.8285
F-statistic	0.076260	(1, 1)	0.8285
F-test summary:			
	Sum of Sq.	Df	Mean Squares
Test SSR	2.85E-07	1	2.85E-07
Restricted SSR	4.02E-06	2	2.01E-06
Unrestricted SSR	3.73E-06	1	3.73E-06

Source: E-views10 outputs

Ramsey Regression Equation Specification Test (RESET) is applied in linear regression equations to test if non-linear combinations associated with the variables (fitted value) help to explain any variation in the response variable (dependent variable). The predicted value (t) should lie between 0 and 1. The Null hypothesis of RESET is stated as follows: If U = 0 or within the acceptable threshold of 0 and 1 then the Model specification being studies have no non-linear combinations

emanating from the independent variables. This means that the model has not omitted any variable and is therefore neither underspecified nor over specified. In Model II, RESET results as shown in Table 4, t = 0.276152 which falls within the threshold of 0 and 1 which means that there is neither under specification or over specified of variables. The Model contains all relevant variables for the study. The acceptance of the Null hypothesis is backed by the p-value of 0.8285 which is greater than the Alpha value of 0.05 implying the acceptance of the Null hypothesis of the absence of non-linear combinations associated with the fitted data (independent variavles) of the model which tended to explain any variation in the dependent.

Co-integration Test

Having established the stationarity of the individual variables, it is also important to establish the stationarity of the linear combinations of the variables as to whether there could be a long-run equilibrium relationship between the dependent variable and the independent variables (that is, whether they are co-integrated). We, therefore, tested for co-integration to establish long-run stationary or stable relationship using the Johansen Co-integration test.

Table 5: Johansen Co-integration Test Result

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.589778	30.72269	20.26184	0.0013
At most 1	0.252175	7.555233	9.164546	0.1001

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Source: Eviews10 Output

From Table 5 above, Trace test indicates one co-integrating equation at 5% level of significance implying that a long run equilibrium relationship exists between the explained variable and the explanatory variables such that the variables move together in the long run.

Table 6: Error Correction Model Test Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.503301	0.139971	60.75043	0.0000
LNPSDD	0.293478	0.037360	7.855492	0.0000
LNSGDD	-0.017296	0.045634	-0.379006	0.7083
LNLGDD	0.009794	0.033543	0.291978	0.7730
ECM(-1)	-0.684824	0.159261	4.300005	0.0003
R-squared	0.987115	Mean dependent var		10.65483
Adjusted R-squared	0.984773	S.D. dependent var		0.464062
S.E. of regression	0.057265	Akaike info criterion		-2.716680
Sum squared resid	0.072144	Schwarz criterion		-2.476711
Log likelihood	41.67519	Hannan-Quinn criter.		-2.645325
F-statistic	421.3616	Durbin-Watson stat		1.718526
Prob(F-statistic)	0.000000			

Source: Eviews10 Output

The Error Correction Mechanism (ECM) test is carried out to determine the speed of adjustment required to return the variables along the long-run equilibrium path after short run shocks resulting in short run disequilibrium which diverted the variables from the long run equilibrium path. An ECM (-1) of 0.68 implies a speed of adjustment of 68% per period (1 year). It will therefore take 100/68 years or periods (approximately1year 6months) for the variables of the model to converge at a long run equilibrium point. With a p-value of 0.0.0000 for LNPSDD, the Null hypothesis of no significant relationship between LNPSDD and LNRGDP is rejectted while those of LNSGDD and LNLGDD with p-values of 0.7083 and 0.7730 respectively are accepted as their p-values are higher than the Alpha value of 0.05. The relationship between the independent variables and the dependent variable is accepted. The dataset qualify for the linear regression analysis.

The Co-efficient of determination (R^2) is 0.987115, approximately 99%. This indicates that about 99% of changes in Real Gross Domestic Product can be explained by the independent variables of the model and approximately 1% by factors outside the model. The overall significance of the model is proven by the F-statistic of 421.3616 with a p-value of 0.0000. The Durbin Watson statistic (1.718526) which falls within the acceptance threshold indicates that the dataset does not exhibit autocorrelation characteristic and were suitable for analysis and forecasting. The individual variables with their regression coefficients, t-statistic and standard errors are displayed below.

RGDP = 8.503301 + 0.293478PSDD – 0.017296SGDD + 0.009794LGDD

7.855492* -0.379006* 0.291978*

0.037360# 0.045634# 0.033543#

Where * represents t-statistic, # represents standard error

The result is mixed as PSDD and LGDD have positive whereas SGDD has negative relationship with RGDP. All the variables either way have modest impacts on RGDP except SGDD which had a negative impact on RGDP. The result shows, for instance, that one percent increase in SGDD will lead to a decrease of 0.0173% in RGDP.

Table 7: Pairwise Granger Causality Test Result

Null Hypothesis:	Obs	F-Statistic	Prob.
LNPSDD does not Granger Cause LNRGDP	26	11.2481	0.0005
LNRGDP does not GrangerCause LNPSDD		0.80507	0.4604
LNSGDD does not Granger Cause LNRGDP	26	5.27744	0.0139
LNRGDP does not Granger Cause LNSGDD		0.05655	0.9452
LNLGDD does not Granger Cause LNRGDP	26	3.52023	0.0480
LNRGDP does not Granger Cause LNLGDD		0.58366	0.5666
LNSGDD does not Granger Cause LNPSDD	26	0.07424	0.9287

LNPSDD does not Granger Cause LNSGDD		1.16604	0.3310
LNLGDD does not Granger Cause LNPSDD	26	0.08978	0.9145
LNPSDD does not Granger Cause LNLGDD		1.64531	0.2169
LNLGDD does not Granger Cause LNSGDD	26	0.81018	0.4582
LNSGDD does not Granger Cause LNLGDD		3.39462	0.0528

Source: E-views10 output

Interpretation of the Granger Causality Results

1. LNPSDD does not Granger Cause LNRGDP: The p-value of 0.0005 is below the Alpha value of 0.05 thereby rejecting the Null hypothesis of LNPSDD does not Granger cause LNRGDP. The high F-statistic of 11.2481 confirms the rejection of the Null hypothesis.

2. LNRGDP does not Granger Cause LNPSDD: The p-value of 0.4604 is greater than the Alpha value of 0.05. The Null hypothesis is here accepted that LNRGDP does not Granger cause LNPSDD. The low F-statistic confirms the acceptance of the Null hypothesis.

3. LNSGDD does not Granger Cause LNRGDP: The p-value of 0.0139 is smaller than Alpha value of 0.05. The Null hypothesis here is rejected. Therefore, LNSGDD did Granger Cause LNRGDP. The high F-statistic confirms the rejection of the Null hypothesis.

4. LNRGDP does not Granger Cause LNSGDD: The p-value of 0.9452 is greater than the Alpha value of 0.05. The Null hypothesis of LNRGDP does not Granger Cause LNSGDD is accepted. The low F-statistic of 0.05655 confirms it.

5. LNLGDD does not Granger Cause LNRGDP: The p-value of 0.0480 is smaller than the Alpha value of 0.05 as stated above is rejected. Therefore LNLGDD does actually Granger cause LNRGDP. The high F-statistic of 3.52023 confirms the rejection of the Null hypothesis.

6. LNRGDP does not Granger Cause LNLGDD: The p-value of 0.5666 is greater than the Alpha value of 0.05 The Null hypothesis as stated above is accepted. The low F-statistic of 0.58366 confirms the acceptance of the Null hypothesis.

7. LNSGDD does not Granger Cause LNPSDD: The p-value of 0.9287 is higher than the Alpha value of 0.05. The Null hypothesis as stated above holds. The low F-statistic of 0.0724 confirms the acceptance of the Null hypothesis.

8. LNPSDD does not Granger Cause LNSGDD: The p-value of 0.3310 is greater than the Alpha value of 0.05. The Null hypothesis is here accepted that LNPSDD does not Granger cause LNSGDD. The low F-statistic of 1.16604 confirms the acceptance of the Null hypothesis.

9. LNLGDD does not Granger Cause LNPSGDD: The p-value of 0.9145 is higher than the Alpha value of 0.05. The Null hypothesis as stated above is accepted. The low F-statistic of 0.08978 confirms the acceptance.

10. LNPSDD does not Granger Cause LNLGDD: The p-value of 0.2169 is greater than the Alpha value 0.05. The Null hypothesis of no significant relationship between LNSDD and LNLGDD is accepted. The low F-statistic of 1.64531 confirms the acceptance.
11. LNLGDD does not Granger Cause LNSGDD: The p-value of 0.4582 is greater than the Alpha value of 0.05.The Null hypothesis is here accepted. The F-statistic result confirms the acceptance.
12. LNSGDD does not Granger Cause LNLGDD: The p-value of 0.0528 is higher than the Alpha value. The Null hypothesis as stated above is accepted. The low value F-statistic of 3.39462 confirms the acceptance.

Conclusion

The study examined the effect of demand deposit on Nigeria economic growth using time series data from 1994-2019. From the findings, the result is mixed as PSDD and LGDD have positive whereas LGDD has negative relationship with RGDP. Only PSDD has significant effect on RGDP. The result shows that while results of PSDD and LGDD are in line with *a-priori* expectation, SGDD is not in conformity with the *a-priori* expectation. However, the result of Pairwise Granger Causality indicates that a unidirectional causality runs from PSDD, SGDD, and LGDD to Real Gross Domestic Product (RGDP) without feedback. From the above, the study concludes that these variables drive RGDP.

Recommendations

i. Government should design policies to encourage financially excluded economic agents controlling funds outside the formal financial system with the aim of contributing to economic growth and development. The current move by CBN through Financial Inclusion Strategy initiated in 2012 and recent Naira redesign policy are steps in the right direction which should be supported. Banks while embracing financial technology should further strengthen financial intermediation through e-channels and agency banking activities towards improved financial deepening.

ii. Regulatory authorities should encourage aggressive mobilization of demand deposits by financial institutions for lending to investors. The positive and significant effect of Private Sector Demand deposit on Nigerian economy shows that Demand deposit enhances Nigeria's economy. It also indicates that PSDD stays long enough in the banking system, enhances money multiplier effect which translates to economic growth. It is therefore recommended that government should encourage aggressive mobilization of demand deposits by financial institutions which if effectively channeled towards credit creation will increase financial sector contribution to GDP. Government can further assist in increasing demand deposit by reintroducing interest payment on current account by banks; a policy introduced in 1989 that might have led to quantum leap in demand deposit by over 150% from N10.56 billion in 1988 to N27.23 billion in 1989. Similarly interest rate on credit to the private sector should be reduced as activities in the sector contribute so much to economic growth in Nigeria. When the interest rates for obtaining credits are not choking,

the private sectors will invest more, thereby giving room for more output and job opportunities.

iii. Interest rates on savings should be increased to boost capital formation. Findings show that all the Savings deposit components exhibited positive and significant impact on the economy though it shows that savings deposit has been contributing positively to economic growth but not as expected. The reason for this scenario is not far-fetched. In Nigeria where inflation rate is often high, savings loses its purchasing power leading to diversion of savings to speculative ventures like real estate. In this way, the structure of long-term productive investment is distorted with its attendant negative impact on the economy. Similarly, due to low interest rate on savings deposit, savers seek alternative investment avenues with higher returns margin. To reverse this trend, government needs to increase interest rates on savings with well-managed price stability.

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