Estimated Effect of Currency Outside Bank, Demand Deposit, Savings Deposit, Time Deposit, Foreign Currency Deposit and Economic Growth in Nigeria

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Abstract
This study focused the effect of currency outside bank, demand deposit, savings deposit, time deposit, foreign currency deposit and economic growth in Nigeria. Data were sourced from central banks of Nigeria statistical bulletin from 1994 to 2012. Real gross domestic product was modeled as the function of currency outside bank, demand deposit, savings deposit, time deposit, and foreign currency. Ordinary Least Squares Regression was employed to reveal potential relationships between causes and effects of the independent variables on the dependent variable. The result shows that 83% of the variations in the dependent variable can be attributed to the variations in the explanatory variables. Furthermore, short run disequilibrium in the model is corrected annually to attain long run equilibrium with an adjustment speed of 21.32%. However, on the two-period lag of LNRGDP, LNCOB and LNTD, one-period lag of LNDD as well as LNFCD have significant effects on RGDP at 5% level of significance. It recommends that the Central Bank of Nigeria should encourage economic growth through appropriate control of currency in circulation outside banking system. This could be achieved by increasing charges on cash withdrawal and reducing charges on electronic transaction to discourage cash carriers; with this, cost of carrying cash such as natural disaster and robbery on individual that made CIC not to predict economic growth very well, could be minimized if not eliminated. The Central Bank of Nigeria should provide level ground for the non-banking consumers and businesses to have a bank account so that they can be active in saving and time deposits. This can be achieved through financial inclusion; some barriers that made many Nigerians not to have bank account should be removed. There should be appropriate supply of money into the economic stream so as to curb inflation in the system; this should be done through proper estimation of the currency outside banking system so that an increase or decrease in M2 will exert positive impact on economic growth. CBN should use its prudential guideline on commercial banks so that they can extend bank branches to the rural area to include the vast major of CIC users into demand, saving and time deposits this will encourage electronic transaction that will help in records keeping and ease data collection on economic growth.

Keywords: *Currency Outside Bank, Demand Deposit, Savings Deposit, Time Deposit, Foreign Currency Deposit, Economic Growth in Nigeria*

INTRODUCTION

Economic growth provides crucial information to government, investors, international communities and organizations (both governmental and nongovernmental) (Ahmed, and Suliman, 2011). This information includes the size of the economy, its rate of growth, GDP per capita, etc. That is why scholars and researchers have embarked on tracing the relationship between economic growth and the factors that fuel its success or otherwise .One of these factors is money supply (Amassona, Nwosa, & Olaiya, 2011). The relationship between money supply and economic growth has a theoretical backing. According to Keynesian Theory of Growth in the supply of money tend to influence the equilibrium value of output and employment because an expansion in money supply will raise the price of bonds and reduces the rate of interest, increase the level of investment and output (Babatunde & Shuaibu, 2011). It should be remembered that in classical theory of inflation the quantity theory of money explain the influence of money supply to be that of raising price or lowering it depending on whether the supply of money is increased or decreased. This shows that if money growth is equal to increases in real GDP, and then there will be no inflation (Chinwuba, Akhor, & Akwaden, 2015). According to the monetarist, an increase in money supply in an economy causes an increase in general price level of commodities which brings about inflationary in the country (). Also related to the issue of inflation is the issue of unemployment which is the primary goal of any economy so as to produce as many goods and services as possible while maintaining an acceptable level of price stability, but this major goal will be very difficult to attain at high inflation rate and price instabilities due to excess money supply in the economy

Dingela and Khobai (2017) explained that economic growth may not be possible without the level of money supply being in equilibrium, they are quick to add that an appropriate control over all the categories of money supply such as narrow money (M1), broad money (M2) and currency in circulation (CIC) may lead to proportionate increases in economic activities. Several studies have been conducted on the link between money supply and economic growth in Nigeria and the challenges posed to policy makers on monetary management. The results of their studies showed some conflicts. Some hold the opinion that money supply impacted positively on the economy. While some studies found a negative relationship between money supply and economic growth the divergence in the results could have been avoided had disaggregated components of money supply been engaged in the analyses. From the above, this study examined the effect of money supply and economic growth in Nigeria.

LITERATURE REVIEW

Money Supply

Money supply is taken as the total amount of money (e.g. currency and demand deposits) in circulation in a country at any given time. Currency in circulation is made up of coins and notes,

while demand deposits or checking current accounts are those obligations which are not associated with any interest payments (in Nigeria before January, 1990) and accepted by public as a means of exchange, drawn without notice by means of cheques. Money supply can be defined as those assets which represent immediate purchasing power in the economy, and hence function as a medium of exchange. In Nigeria, the narrow money supply (M1) is defined as currency outside the banks plus demand deposits of commercial banks plus domestic deposits with the central bank, less federal government deposits at commercial banks.

Currency Outside Bank

Currency outside bank (COB) refers to all notes and coins held outside the Central Bank (2012). Fadiya (2013) defines it as the amount of notes and coins held by economic agents outside banking sector and are the most liquid monetary aggregate. It is a liability of CBN and a claim of the public against CBN. This amount represents money CBN owes the public (individuals, households, firms, financial institutions and other organizations) in the economy that use CBN currency notes for the day to day transactions.

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.

Savings Deposit

This is a liability of the deposit money banks or what the deposit money banks owe the non-bank savings depositors. It is held at a bank or another deposit financial institution where a saver can deposit sum of money payable on demand. It is an interest bearing account where individuals, groups, organizations save their surpluses for future use. Banks usually calculate and pay interest on savings account monthly on a specified day of the month based on the date of the initial deposit. Banks charge withholding tax on the interest paid to the account holder. Usually a minimum balance is maintained and the account cannot be overdrawn. Savings is another important form of deposit account traditionally evidenced by a passbook but now virtually replaced by electronic banking operation. Banks usually allow a maximum number of withdrawals above which the account will no longer attract interest. It has been a general observation that savings accounts are most popular with low and middle income earners and non-profit making organizations. Financial institutions mobilize savings and channel them to the deficit units as capital needed for economic growth and development.

Time Deposit

This is the type of an account where a customer keeps a specific sum of money for an agreed period of time. Like the earlier discussed deposit accounts, it is a liability of the deposit money banks and what the deposit money banks must pay the depositors at maturity. The account usually has a tenure ranging from 7 days to one year or more. The interest rate is determined by the tenure and the size of deposit. The account carries a definite tenure with specified interest rate which may be fixed. It is an investment account with a fixed interest is fixed at the time of deposit. The depositor usually maintains an account into which the proceeds are credited. Depositors can terminate the deposit before maturity subject to a penalty. At maturity the account holder may decide to withdraw and close the account or roll over. It is the most stable of all the deposits and as such used as a source of fund by some banks for medium and long term credit facilities.

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 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. 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 (Hussein, K. & Thirlwall, A. P. (2000). For the purpose of this study, Real Gross Domestic Product constitutes the main aspect of the investigation.

Empirical Review

Ibi, Basil, and Ojong (2019) 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.

Ifionu and Akinpelumi (2015) 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.

Ifionu and Akinpelumi (2015) 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.

Ihsan and Anjum (2013) 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.

Ikechukwu (2012) investigated the long and short run relationships between broad money supply (M2) and real aggregate output (GDP) in Nigeria from 1981 to 2015. An unrestricted version of Mixed Data Sampling (U-MIDAS) technique and Autoregressive Distributed Lag (ARDL) technique were employed. The U-MIDAS results affirm the existence of a long and short run

relationship between yearly real GDP and quarterly broad money supply at different season while the ARDL result affirm that money supply impacted significantly on real GDP in the long run only. This study does not include narrow money supply (M1) and currency in circulation (CIC). Ikechukwu (2012) investigated the dynamic impact of broad money supply(M3) on economic growth (GDP) per capita in South Africa using time-series data between the period1980-2016.The study employs the autoregressive distributed lag (ARDL)-bounds testing approach to Co-integration and error correction model to investigate the impact of M3 on GDP per capita. The model is specified with four macroeconomics variables, namely, Gross Domestic Product (GDP) per capita, Broad money supply (M3), Interest rate (INT), Inflation rate (INF). The findings reveal that there is statistically significant positive relationship between money supply and economic growth both in short run and long run.

Iwedi (2016) investigated the impact of monetary policy on economic growth in Nigeria using annual data covering the period between1970-2012. Specifically, they seek to analyze the relationship between money supply and economic growth in Nigeria; to determine the nature and direction of causality between money supply and economic growth. The study employs the Ordinary Least Square (OLS) techniques and the granger causality test. The result indicates a positive and insignificant relationship between money supply and economic growth. Keith band & Peter Howells.(2003). estimated time series data covering a period between1981-2008 with simple OLS on the Nigeria economy, the result shows that money supply exerts a considerable positive impact on economic growth.

Khobai H. & Dingela, S, (2017).looked at macroeconomic variables and supply: Evidence from Nigeria; between the period1985-2013 Using OLS method and finds that inflation is inversed to money supply M2 while GDP is positive. Inam (2014) examined the role of money supply in economic growth between the period1985 - 2012. Using augmented Cobb-Douglas production function and relying on co-integration/Error- Correction Methodology, they find that money supply does not only have a positive impact on economic growth in Nigeria, but such impact is strongly and statistically significant.

Maitra, B. (2011) 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.

Ufoeze, Odimgbe and Ezeabalis (2018) investigated the effect of monetary policy on economic growth in Nigeria; time series data covering the period 1986 to 2016.The study adopts an Ordinary Least Squared (OLS) technique. The core finding of this study shows that monetary policy interest rate and investment have insignificant positive effect on economic growth in Nigeria. Money supply, however, has significant positive effect on growth in Nigeria. While exchange rate, has significant negative effect on GDP in Nigeria.

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. Maltus and West (1815) 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.

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 Mankiw, G. (2003). 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 (Michael& Ebibai, 2014). As the countries studied operate under different legal and economic environments, this constitutes a location gap. 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 (OECD (2014). providing gap in estimation tools. This study focused on money supply 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 (Ogunmuyiwa, M.S. & Ekone A.F (2010). 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).

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, COB, DD, SD, TD and FCD is stated as follows:
RGDP =f(COB, DD, SD, TD, FCD)
Where COB = Currency outside bank; DD = Demand deposit; SD =Savings deposit; TD = Time deposit; FCD = Foreign currency deposit
The econometric model is presented thus:
$RGDP = f_0 + f_1COB + f_2DD + f_3SD + f_4TD + f_5FCD + U_t$
The model in the log linear form can be expressed as:
$LnRGDP = fo + f_1lnCOB + f_2lnDD + f_3lnSD + f_4lnTD + f_5lnFCD + ut$ …… (4)
f_O is the intercept, f_1-f_3 are coefficients of the independent variables and U is the error term representing the unaccounted factors outside the model which influence the dependent variables. The *a priori* expectations are f_1-f_5>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

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

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

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.

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

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

(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.

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.

Co-integration Test (Johansen's test)

It has already been 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:

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

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.

RESULTS AND DISCUSSIONS OF FINDINGS

As procedure demands, unit root test was conducted on all the time series data of the model to check for stationarity of the series. Unit roots are characteristics of some time series data, and if this is not checked, the analysis will produce spurious results. Data is stationary when it has a constant mean value, variance and co-variance or where the calculated ADF is greater than the critical ADF.

Table 1: Summary of the Unit Root Test

Variables		t-statistic	Critical value (0.05)	Prob.	Order of Int.
LNCOB	- Level	-1.850135	-2.898064	0.5367	1(1)
	- 1st Dif	-4.084205	-2.991878	0.1479	
LNDD	Level	-2.412308	-2.976263	0.2166	*I*(1)
	1stDif	-3.577225	-2.981038	0.0136	
LNSD	Level	-0.488255	-2.976263	0.8789	*I*(1)
	1stDif	-6.053582	-2.981038	0.0000	
LNTD	Level	-1.839723	-2.976263	0.3543	*I*(1)
	1stDif	-4.227898	-2.981038	0.0029	
LNFCD	Level	-2.434841	-2.976263	0.1421	*I*(1)
	1stDif	-6.686149	-2.981038	0.0000	
LNRGDP	Level	-1.490197	-2.976263	0.5232	*I*(1)
	1stDif	-6.035565	-2.986225	0.0000	

Source: E-views10 output

The ADF result in Table 1 shows that the variables are all integrated at their first differences, *I*(1). Given that the probabilities are less than 0.05, the null hypotheses that the variables have unit roots are therefore rejected, thus, all the variables stationary and suitable for further analysis.

Normality, Serial Correlation, Heteroskedasticity, Misspecification and Stability Tests for OLS Result

In order to further ascertain that the data for the study were good enough for analysis, we investigated if the data were normally distributed at the mean and the residuals serially uncorrelated and homoskedastic. The result of the test is presented in Figure 1

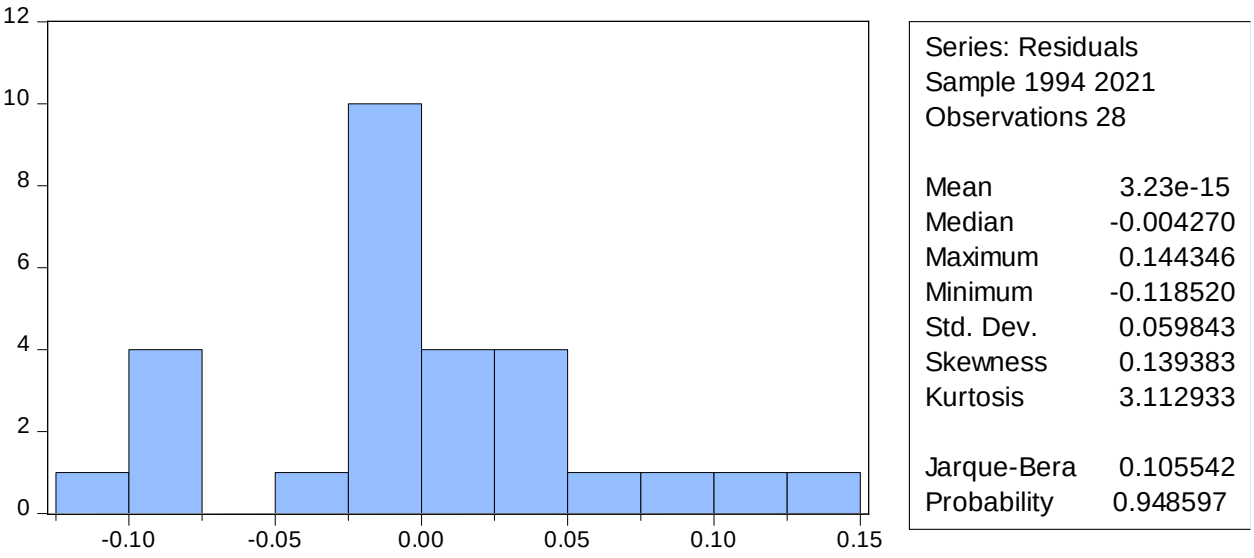

Figure 1: Jarque-Bera Normality Test
Source: E-views10 output

In Figure 1, the Histogram Normality Test shows that the residuals of the model are not completely bell-shaped, but it however indicates skewness and kurtosis of 0.140 and 3.11 respectively. Furthermore, the JB statistic and p-value were 0.106 and 0.95. Given that the p-value is greater than 0.05, it is concluded that the residuals of the model are normally distributed.

Table 2 Serial Correlation and Heteroskedasticity Tests

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	3.736010	Prob. F(2,20)	0.3418
Obs*R-squared	7.615623	Prob. Chi-Square(2)	0.1222
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.973033	Prob. F(5,22)	0.4558
Obs*R-squared	5.070680	Prob. Chi-Square(5)	0.4073
Scaled explained SS	3.307130	Prob. Chi-Square(5)	0.6528

Source: E-views10 Output

Ramsey Rest Test

Ramsey RESET Test
Equation: UNTITLED
Specification: LNRGDP LNCOB LNDD LNSD LNTD LNFCD C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.416737	21	0.1712
F-statistic	2.007143	(1, 21)	0.1712
Likelihood ratio	2.555904	1	0.1099

Source: E-views10 Output

The Null hypothesis of no serial correlation in Model VI is accepted with p-value of 0.3418 as shown in Table 2 and which is greater than the Alpha value of 0.05. The Null hypothesis of heteroskedasticity is also accepted given the p-value of 0.4558 of Table 4.37 which is higher than the 0.05 Alpha value implying absence of heteroskedasticity in the model. Similarly, in Ramsey Rest Test with F-statistic value and p-value of 2.007143 and 0.1712 respectively, it implies absence of misspecification in the model.

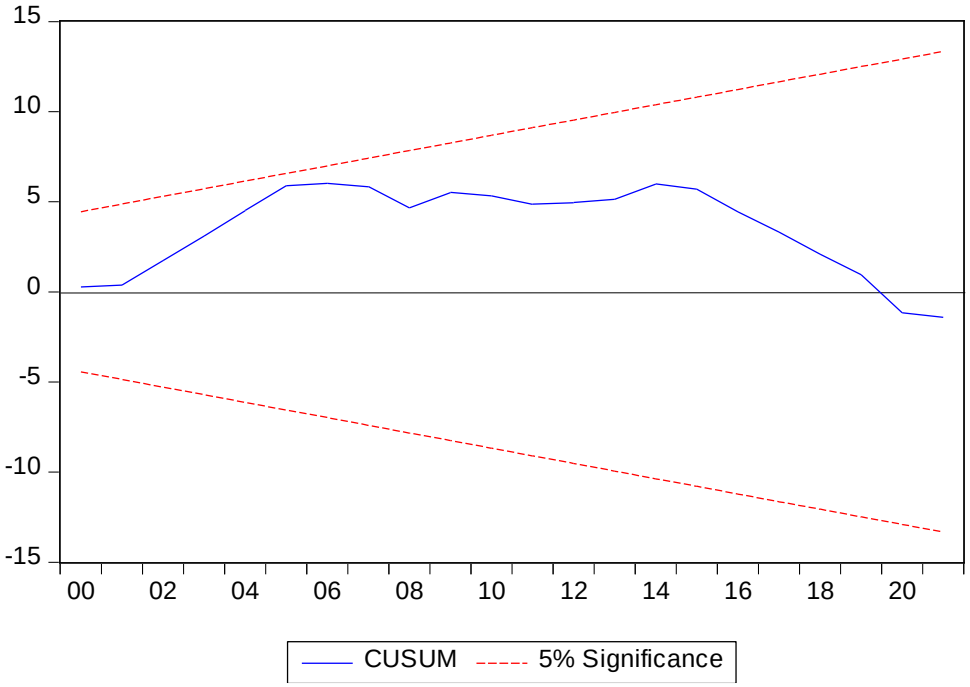

Figure 2: CUSUM Test
Source: E-views10 Output

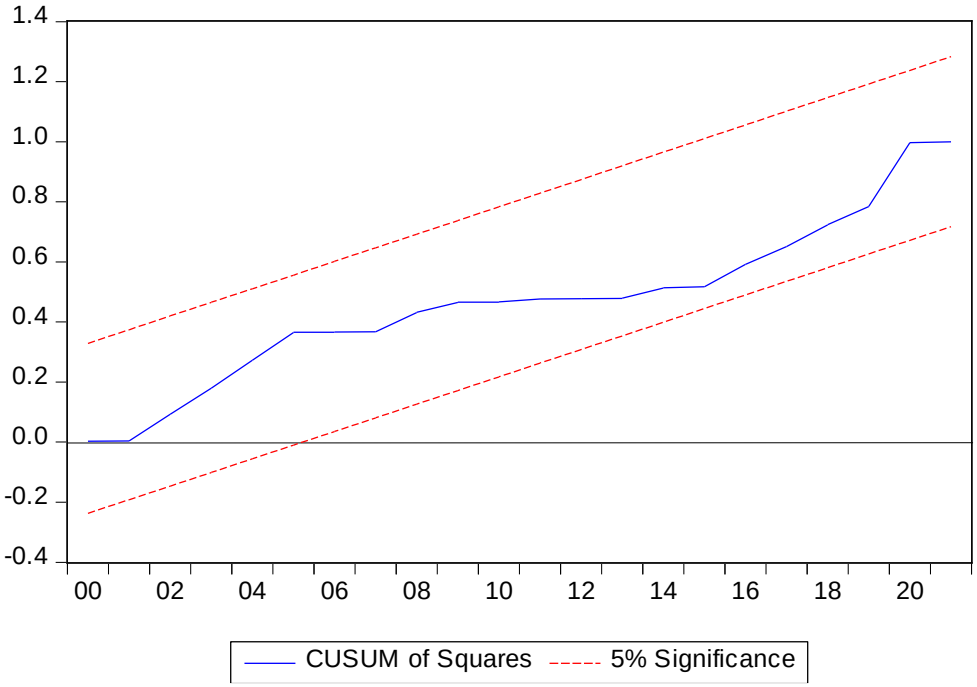

Figure 3: CUSUM of Squares Test
Source: E-views10 Output

The Cusum and Cusum of Squares tests in Figures 2 and 3 reveal that the model estimates are stable across the period. Since the estimated OLS result is serially correlated, there is need for other analytical techniques to be employed, such as co-integration and ECM.

Co-integration Test

Having established the stationarity of the individual variables, it is also important to establish the cointegration of the variables and the long-run equilibrium relationship between them. For this analysis, Johansen cointegration test technique was deployed and the results.

Table 4 Johansen Co-Integration Test Result

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.901586	152.6588	103.8473	0.0000
At most 1 *	0.742940	92.37591	76.97277	0.0021
At most 2 *	0.594996	57.05630	54.07904	0.0265
At most 3	0.518856	33.55600	35.19275	0.0743
At most 4	0.282299	14.53468	20.26184	0.2543
At most 5	0.203337	5.910417	9.164546	0.1977

Source: E-views10 Output

Table 4 shows the summary results of the Johansen Co-integration test employed on the long run co-integration relationship between Real Gross Domestic Product and explanatory variables in the model. Both the Trace and Maximium Eigenvalue tests indicate the presence of three co-integrating equations at the 5% level of significance which implies a co-integration of the variables of the model and a long run equilibrium relationship between the dependent variable and the explanatory variables. In other words, equilibrium is sustainable in the long run and that the variables move together in the long run.

Error Correction Model

Next in the series of tests carried out was the Error Correction Model. This test is conducted to ascertain the short run effect of the explanatory variables on the dependent variable. Though there is a long run relationship between the variables, short run errors arising from economic shocks have to be corrected before equilibrium is restored in the long run. 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 or in other words, the rate at which the error in the short run is corrected for the variables to attain equilibrium in the long run.

Table 4: Over-parameterized Error Correction Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNRGDP(-1))	0.202593	0.291374	0.695302	0.9129
D(LNRGDP(-2))	0.551496	0.279426	1.973678	0.0359
C	0.015190	0.039202	0.387485	0.7118
D(LNCOB)	0.004379	0.109754	0.039898	0.9695
D(LNCOB(-1))	0.081202	0.095416	0.851036	0.4274
D(LNCOB(-2))	0.146977	0.008445	2.355320	0.0241

D(LNDD)	-0.013993	0.078730	-0.177735	0.8648
D(LNDD(-1))	-0.087066	0.026040	-2.318367	0.0355
D(LNDD(-2))	0.040155	0.047944	0.837530	0.4344
D(LNSD)	-0.082616	0.074375	-1.110801	0.3092
D(LNSD(-1))	-0.047716	0.102891	-0.463748	0.6592
D(LNSD(-2))	-0.090777	0.084202	-1.078088	0.3224
D(LNTD)	0.021928	0.035989	0.609305	0.5647
D(LNTD(-1))	0.052225	0.047066	1.109613	0.3096
D(LNTD(-2))	0.053369	0.011543	2.284689	0.0463
D(LNFCD)	-0.055528	0.033555	-0.659218	0.3342
D(LNFCD(-1))	-0.055543	0.005107	-2.220774	0.0326
D(LNFCD(-2))	-0.002124	0.016894	-0.125734	0.9041
ECM(-1)	-0.213275	0.043842	-2.874645	0.0154
R-squared	0.919699	Mean dependent var		0.049166
Adjusted R-squared	0.828796	S.D. dependent var		0.036766
S.E. of regression	0.020837	Akaike info criterion		-4.811265
Sum squared resid	0.002605	Schwarz criterion		-3.884919
Log likelihood	79.14081	Hannan-Quinn criter.		-4.554336
F-statistic	8.817710	Durbin-Watson stat		2.061941
Prob(F-statistic)	0.002391			

Source: E-views10 Output

The Over-parameterized Model is estimated with two lags for each of the independent variables. The result shows that 83% of the variations in the dependent variable can be attributed to the variations in the explanatory variables. Furthermore, short run disequilibrium in the model is corrected annually to attain long run equilibrium with an adjustment speed of 21.32%. However, on the two-period lag of LNRGDP, LNCOB and LNTD, one-period lag of LNDD as well as LNFCD have significant effects on RGDP at 5% level of significance.

Parsimonious Error Correction Model

The Error Correction Model (Parsimonious Model) is a refined version of the Over parameterized Model which contains overbloated data and sometimes wrong signs not in accordance with *a-priori* expectations. The Error Correction Model (Parsimonious Model) is free from overbloated and wrong signed data. It shows a better and a more accurate results than the OLS Model results. The coefficients of the fitted data are more reliable for forecasting.

Table 5: Parsimonious Error Correction Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNRGDP(-1))	0.168081	0.206880	0.812460	0.4312
D(LNRGDP(-2))	0.583773	0.191797	3.043697	0.0094
C	-0.016842	0.009963	-1.690474	0.1148
D(LNCOB(-1))	0.139825	0.075941	1.841242	0.0885
D(LNCOB(-2))	0.167677	0.066196	2.533021	0.0250
D(LNDD)	-0.052030	0.031287	-1.663006	0.0202
D(LNDD(-1))	-0.084089	0.043938	-2.913800	0.0079

D(LNTD)	0.050663	0.021618	-2.261939	0.0075
D(LNTD(-1))	0.048713	0.025561	1.905757	0.0790
D(LNTD(-2))	0.039309	0.028120	1.397904	0.0055
D(LNFCD)	-0.007886	0.015685	-2.502754	0.0235
ECM(-1)	-0.155023	0.090460	-1.713714	0.0103
R-squared	0.873494	Mean dependent var		0.049166
Adjusted R-squared	0.766451	S.D. dependent var		0.036766
S.E. of regression	0.017768	Akaike info criterion		-4.916759
Sum squared resid	0.004104	Schwarz criterion		-4.331699
Log likelihood	73.45949	Hannan-Quinn criter.		-4.754488
F-statistic	8.160184	Durbin-Watson stat		2.047165
Prob(F-statistic)	0.000353			

Source: Eviews10 Output

From the result of the Parsimonious error correction model indicated in Table 4.40, the Adjusted R^2 shows that approximately 76.65% of the increases in RGDP were contributed by money supply components. LNRGDP (-2), LNCOB (-2), LNCOB (-1), and LNTD contributed positively to LNRGDP in the period. LNDD, LNDD (-1) and LNFCD (-1) contributed negatively to the economy in the period. The speed of adjustment is 15.50% and the time lag for converging of the variables at an equilibrium point is 100/15.5 years or approximately 6years 6months. Furthermore, the DW statistic of 2.047 confirms absence of auto-serial correlation in the model.

Granger Causality Test

Regression analysis assumes the dependence of one variable on the other variables while Granger causality test examines the causality relationship between two past paired variables of a model with the objective of applying the established causality relationship between the two paired variables to forecast the future. In Granger analysis the relationship between the past and future events has to be recognized. Past events can be used to predict the future but future events cannot predict past events. For example if Event A happened before Event B happened it could be true that Event A is causing Event B. In Granger Causality analysis. Y is granger-caused by X if X helps in the prediction of Y. This means that X can only granger-cause Y if X's lagged values are statistically significant.

Table 4: Granger Causality Test

Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
LNCOB does not Granger Cause LNRGDP	26	7.85990	0.0028
LNRGDP does not Granger Cause LNCOB		2.48390	0.1076
LNDD does not Granger Cause LNRGDP	26	12.6809	0.0002
LNRGDP does not Granger Cause LNDD		0.65840	0.5280
LNSD does not Granger Cause LNRGDP	26	4.04232	0.0091
LNRGDP does not Granger Cause LNSD		0.62201	0.5465
LNTD does not Granger Cause LNRGDP	26	7.24956	0.0040
LNRGDP does not Granger Cause LNTD		0.11621	0.8909
LNFCD does not Granger Cause LNRGDP	26	6.64011	0.0058
LNRGDP does not Granger Cause LNFCD		0.03802	0.9628

Source: E-views10 Output

Interpretation of Model VI Granger Causality Test Result

1. LNCOB does not Granger Cause LNRGDP: The p-value of 0.0028 is smaller than the Alpha value of 0.05. The Null hypothesis as stated above is rejected. Hence there isa significant relationship between LNCOB and LNRGDP as confirmed by high F-statistic of 7.85990.
2. LNRGDP does not Granger Cause LNCOB: The p-value of 0.1076 is greater than the Alpha value 0.05. The Null hypothesis of no significant relationship between LNRGDP and LNCOB is accepted. The low F-statistic of 2.48390 confirms the acceptance.
3. LNDD does not Granger Cause LNRGDP: The p-value of 0.0002 is less than the Alpha value of 0.05.The Null hypothesis is here rejected. The high F-statistic 12.6809 confirms the rejection.
4. LNRGDP does not Granger Cause LNLDD: The p-value of 0.5265 is higher than the Alpha value. The Null hypothesis as stated above is accepted. The low value F-statistic of 0.65840 confirms the acceptance.
5. LNLSD does not Granger Cause LNRGDP: The p-value of 0.0091 is smaller than the Alpha value of 0.05. The Null hypothesis is rejected. The high F-statistic of 4.04232 confirms it.
6. LNRGDP does not Granger Cause LNSD: The p-value of 0.5465 is greater than the Alpha value of 0.05. Therefore the Null hypothesis is accepted. The low F-statistic of 0.62201 confirms the acceptance of the Null hypothesis.
7. LNTD does not Granger Cause LNRGDP: The p-value of 0.0040 is lower than the Alpha value of 0.05, hence Null Hypothesis is rejected. The high F-statistic of 7.24956 confirms the rejection.
8. LNRGDP does not Granger Cause LNTD: The p-value of 0.8909 is higher than the Alpha value of 0.05. The Null hypothesis is accepted as confirmed by the low F-statistic of 0.11621.
9. LNFCD does not Granger Cause LNRGDP: The p-value of 0.0058 is smaller than the Alpha value of 0.05; hence the Null hypothesis is rejected. This sis confirmed by the high F-statistic of 6.64011.
10. LNRGDP does not Granger Cause LNFCD: Based on the p-value of 0.9628 which is higher than the Alpha value of 0.05, the Null hypothesis is hereby accepted. The low F-statistic of 0.03802 confirms the acceptance.

Cholesky Variance Decomposition Test

Table 4.42 Cholesky Variance Decomposition Test

Period	S.E.	LNRGDP	LNCOB	LNDD	LNSD	LNTD	LNFCD
1	0.016244	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.018762	84.78345	3.022434	0.512734	7.280606	1.530790	2.869990
3	0.028995	38.17540	30.59247	0.991211	26.33091	1.564955	2.345050
4	0.037828	29.62397	37.25482	0.609853	18.09225	11.81313	2.605966
5	0.058633	12.90715	51.73272	1.246514	9.143027	23.76994	1.200637
6	0.079643	11.78999	47.26979	2.425416	8.584463	29.18624	0.744093
7	0.101103	8.238089	53.66136	2.799964	5.591710	29.24009	0.468783
8	0.118646	9.850455	50.62534	3.355517	6.894663	28.87369	0.400342
9	0.134265	8.442832	53.46816	3.766696	5.602349	28.40108	0.318880
10	0.147585	9.842444	50.02443	4.214234	7.916384	27.71191	0.290598

Cholesky Ordering: LNRGDP LNCOB LNDD LNSD LNTD LNFCD

Source: E-views10 Output

The Variance Decomposition result reveals that previous economic performance of the past ten years accounts for 100% and 85% of the variations in RGDP in the first two periods. However, in the last four periods starting from the 6th period, less than 10% of RGDP was determined by previous RGDP. On the other hand, LNTD accounted for an average of 30% of the variations in RGDP from the fifth period. Contribution of LNTD in the first 3 periods was very insignificant. LNDD, LNSD and LNFCD accounted for an average of 3.5%, 6.5% and 0.37% in the last four periods.

Cholesky Impulse Response Test

Table 4.43 Impulse Responses of RGDP to LNCOB, LNDD, LNSD, LNTD and LNFCD

Response of LNRGDP:

Period	LNRGDP	LNCOB	LNDD	LNSD	LNTD	LNFCD
1	0.016244	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.005881	-0.003262	-0.001343	0.005063	0.002321	0.003179
3	0.004741	0.015702	0.002555	-0.013991	0.002787	0.003100
4	-0.010147	0.016610	-0.000627	-0.006125	0.012485	0.004192
5	-0.004453	0.035290	-0.005842	-0.007445	0.025458	0.001997
6	-0.017439	0.034927	-0.010535	0.015172	0.032158	0.002434
7	-0.009708	0.049868	-0.011505	0.005202	0.033728	0.000849
8	-0.023336	0.040513	-0.013644	0.019974	0.032797	0.002905
9	-0.011634	0.050122	-0.014376	0.006275	0.032486	0.001062
10	-0.024937	0.035459	-0.015456	0.026728	0.030269	0.002411

Source: E-views10 Output

The Cholesky Impulse Response Test in Figure 2 reports the response of RGDP to one standard deviation innovations in each of the independent variable and on itself over the next ten-year

period. The impulse response of RGDP to own shock is positive in the first three years (short term) but at a decreasing rate, becomes negative in the 4th year and continues to decline all through the medium and long terms. On the other hand, RGDP is unaffected by shocks from COB in the first two years but it becomes positive and increased in the 3rd year, rose sixth and seventh years slightly falling towards the last four years. In contrast, the impulse response of RGDP to shocks emanating from LNDD is negligible in the first four years but becomes negative after the 4th year and continues a downward trend throughout the remaining years. Similarly, RGDP is unaffected by shocks from LNSD but is negatively affected from the 3rd year; although it rises slightly in the medium term. In addition, RGDP reacts negligibly to shocks emanating from LNTD but increases sharply in the medium term and gradually rises in the long term unaffected by shock lastly; shocks due from LNFCD resulted in a slight increase in RGDP in the second and last three years but had almost no impact in the medium term (5th to 7th years).

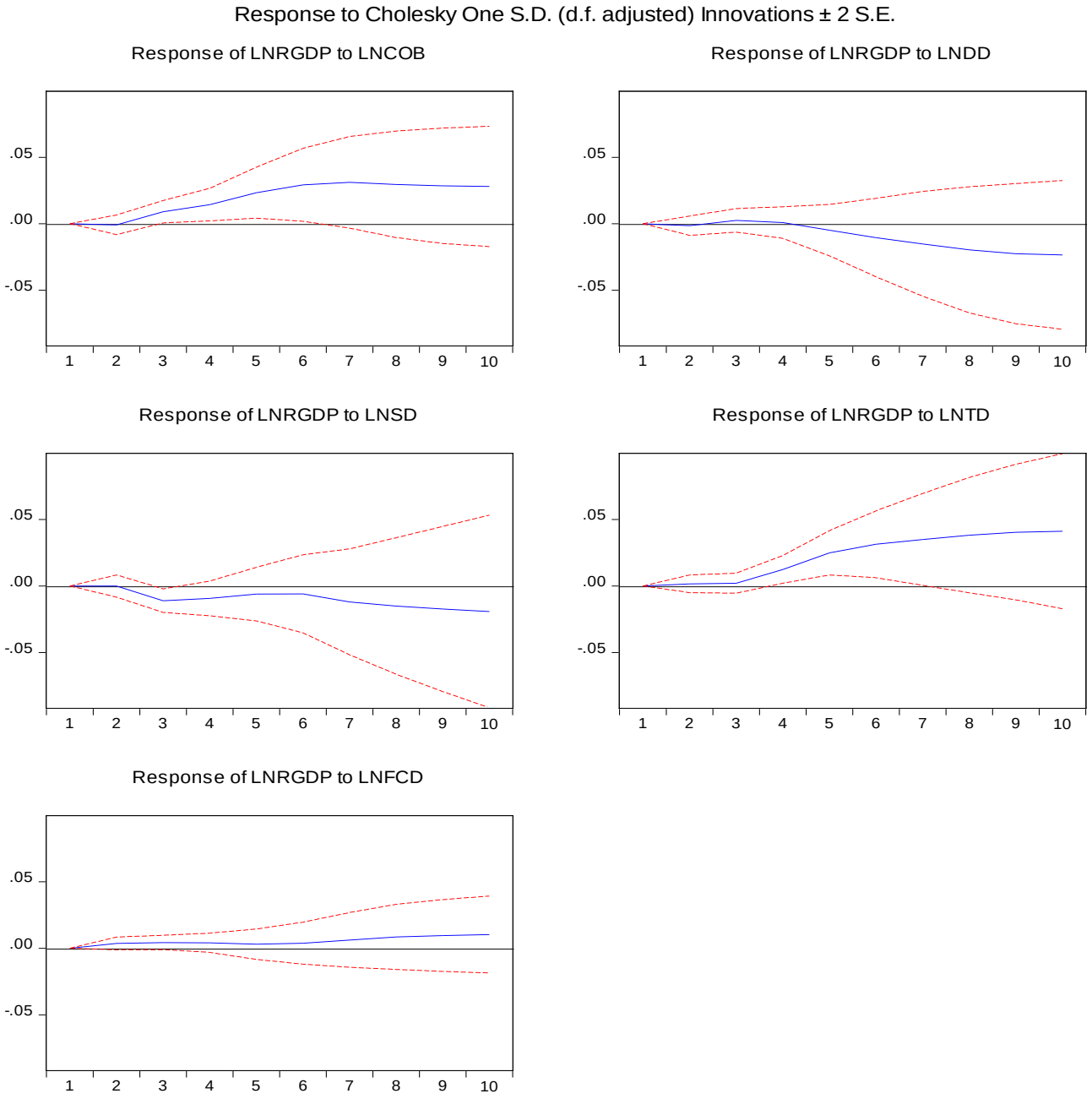

Figure 4 Impulse Response of RGDP to LNCOB, LNDD, LNSD, LNTD and LNFCD
Source: E-views10 Output

CONCLUSION AND RECOMMENDATIONS

Conclusion

To assess the extent to which aggregate currency outside bank, demand deposit, savings deposit, time deposit, and foreign currency deposit have relationship with Nigeria's RGDP. Parsimonious ECM Model revealed that all the independent variables (except COB) are statistically significant in the current period. The result also indicates that both LNCOB and LNTD as well as their lagged values were correctly signed, in line with the *a-priori* expectation, whereas LNDD and LNFCD as well as their lagged values were negatively signed; implying an inverse relationship with RGDP. The result of Pairwise Granger Causality test established a unilateral causality flowing from all the independent variables (aggregate broad money supply components) to RGDP. This result confirms the observations, Soludo, (2004) that Nigerian banks significantly depend on government deposits of the three tiers of government and parastatals accounting for over 20 percent and in some cases in excess of 50% of total deposit liabilities of deposit money banks. He went further that these banks frequently used these deposits to trade in foreign exchange transactions, buy government treasury bills among others rather than channelling mobilized funds to the real sector of the economy.

Recommendations

i. It is recommended that, the Central Bank of Nigeria (CBN) should encourage economic growth through appropriate control of currency in circulation outside banking system. This could be achieved by increasing charges on cash withdrawal and reducing charges on electronic transaction to discourage cash carriers; with this, cost of carrying cash such as natural disaster and robbery on individual that made CIC not to predict economic growth very well, could be minimized if not eliminated.

ii. The Central Bank of Nigeria should provide level ground for the non-banking consumers and businesses to have a bank account so that they can be active in saving and time deposits. This can be achieved through financial inclusion; some barriers that made many Nigerians not to have bank account should be removed.

iii. There should be appropriate supply of money into the economic stream so as to curb inflation in the system; this should be done through proper estimation of the currency outside banking system so that an increase or decrease in M2 will exert positive impact on economic growth. CBN should use its prudential guideline on commercial banks so that they can extend bank branches to the rural area to include the vast major of CIC users into demand, saving and time deposits this will encourage electronic transaction that will help in records keeping and ease data collection on economic growth.

iv. Finally, the Central Bank should implement its cashless policy with ease, not to cover charge on electronic transfer in order to encourage the further use of quasi-money in the economic system.

REFERENCES

Ahmed, E., M. and Suliman, S., Z. (2011). The long-run relationship between money supply, real GDP on price level: empirical evidence from Sudan. *International Journal of Economics, Commerce and Management, 5(2), 40 -68.*

Amassona, D., Nwosa, P., I. & Olaiya, S., A. (2011). An appraisal of monetary policy and its effect on macroeconomic stabilization in Nigeria. *Journal of Emerging Trends in Economics and Management Sciences (JETEMS), 2(3), 232-237*

Babatunde M., A. & Shuaibu (2011). Money supply inflation and economic growth in Nigeria. Asian. *African Journal of economics and econometrics, 15(1), 147-165*

Chinwuba, O., Akhor, S., O. & Akwaden, S., T. (2015). Monetary policy innovations and growth rate of output in Nigeria. *International Journal of Economics and Business Management, 1(4), 1-15.*

Department of Economics, Caritas University, Amorji-Nike, Enugu, Nigeria

Dingela, S. and Khobai, H.(2017). Dynamic impact of money supply on economic growth in South Africa. An ARDL Approach. MPRA Paper NO. 82539 El-

Fadiya, B. B. (2013), Does Currency in Circulation Promote Economic Performance in Developing Countries? Evidence from Nigeria, *International Business Research*; 6(10), 13-21

Hussein, K. & Thirlwall, A. P. (2000). The AK Model of New Growth Theory: Investment and growth revisited, *Journal of Post-KeynesianEconomics*,22(3), 27-35.

Ibi, E. E., Basil, R. & Ojong, C. M. (2019). Effect of selected macroeconomic variables on money supply in Nigeria, *European Journal of Economic and Financial Research*, 3(3), 61-90.

Ifionu, E. & Akinpelumi, O. F. (2015). Macroeconomic variables and money supply: Evidence

Ihsan, I.& Anjum, S. (2013). Impact of money supply on GDP of Pakistan, *Global Journal of*

Ikechukwu, N.(2012). The impact of money supply on economic growth in Nigeria (1981-2010),

Isiaka, S., B., Abdulraheem, A., & Mustapha, I. Y. (2011). Impact of fiscal and monetary policy on the level of economic activities in Nigeria. *Lapai Journal of management Sciences, 12(2), 1-22*

Iwedi, M. (2016). Modelling financial intermediation functions of banks: Theory and empirical from Nigeria, *International Multidisciplinary Journal*, Ethiopia, 9(4), 288-307.

Keith band & Peter Howells.(2003).*Monetary economics, policy and its theoretical basis*, Addis Ababa, Palmgrove-Macmillan.

Khobai H. & Dingela, S, (2017). Dynamic impact of money supply on economic growth in South Africa: An ARDL approach. *Munich Personal RePEc Archive MPRA Paper*.

Maitra, B. (2011). Anticipated money, unanticipated money and output variations in Singapore, *Journal of Quantitative Economics*, 9 (1), 119-125.

Maltus, T. R., & West, E. (1815). *The Application of Capital to Land*, Baltimore, John Hopkins Pres

Management and Business Finance Research, 13(10), 11-15

Mankiw, G. (2003). *Macroeconomics*. New York. Harvard University Press. Michael, B. & Ebibai, T. S. (2014). Monetary policy and economic growth in Nigeria (1980-2011). *Asia Economic and Financial Review*, 4(1), 20-32.

OECD (2014). National income per capita, in OECD Factbook 2014: Economic, Environmental of Nigeria. *International Journal of Applied Econometrics and Quantitative Studies*, 6(3), 2-4.

Ogunmuyiwa, M.S. & Ekone A.F (2010). Money Supply - Economic Growth Nexus in Nigeria. *International Journal of Banking and Finance Research*, 22(3), 199-204.

Seoud, M. S. (2014). Testing the relationship between money supply and GDP in Bahrain. *International Journal of Economics, Commerce and Management, 2: 18-25*

Soludo, C. C. (2004). Being an address delivered to the Special Meeting of the Bankers' Committee, held on July 6, 2004 at the CBN Headquarter, Abuja.

Taiwo, M. (2012) . Impact of injection and withdrawal of money stock on economic growth in Nigeria. European Journal of Business and Management Sciences, 4(2), 33-42,

Ufoeze, L., O., Odimgbe, S., O., Ezeabalisi, V., N. & Alajekwu, U., B. (2018). Effect of monetary policy on economic growth in Nigeria: An Empirical Investigation

Uwakaeme, S. O. (2017). *Inflation and economic growth in Nigeria: Determinants and* Winston Inc.