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# The impact of money supply on economic growth in Nigeria, 1986-2019

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ABSTRACT

This study examined the impact of money supply on economic growth in Nigeria, 1986-2019. The objectives were to; to ascertain the impact of broad money supply on economic growth in Nigeria, to determine the impact of ratio of private sector credit to GDP on economic growth in Nigeria. The study used ex-post facto design as it was relied on already recorded events, and researchers do not have control over the relevant dependent and independent variables they are studying with view to manipulating them. The analytical tools used were unit root test, descriptive statistics and ordinary least square. The study found out that broad money supply and ratio of Private sector credit to GDP has positive and significant impact on economic growth in Nigeria. The study recommended that The CBN should be made more effective in its monetary management by making all financial markets organized so as to accentuate the effects of monetary policy variables like Broad money supply. This promotes real GDP in Nigeria. The government should encourage monetary authorities like the Central Bank of Nigeria to build a conducive and enabling environment for friendly interest rates so that prospective investors can increase their investment and raise the nation's production capacity. This can be achieved through low unremunerated reserve requirements and adequate physical and financial infrastructure to remove the impediments that lead to the gap between the savings and lending rate. This is because the interest rate is the stimulating factor in savings and investment decisions in the economy. Attempts should be made by the government to improve on its infrastructure in order to reduce cost of production and increase exportation so as to achieve the objective of naira devaluation. This adds to the country's national income and in general promotes the real GDP.

Keywords: Money, Economic growth, CBN and GDP

## INTRODUCTION

Economic growth provides crucial information to government, investors, international communities and organizations (both governmental and nongovernmental) [1,2]. 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 [3,4]. 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 reduce the rate of interest, increase the level of investment and output [5]. 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 [6]. Other scholars have also pulled out their views concerning how money supply is related to economic growth. [7] is in the view that lowering money stock by increasing interest rate would lower Gross Domestic Product (GDP). [8], argued that variations in the quantity of money supply is the most important determinant of economic growth and nations that sacrificed more time in studying the behavior of aggregate money supply rarely experience poor economic

performance and claimed that this is also the views of some economists. Steve and Domingo contended that there may not be positive economic growth without an appropriate financial condition. [9] is in theview that money supply more or less influences Economic growth.

Economists have disagreement on the effect of money supply on economic growth [. While some believe that the most important determinant of economic growth is variation in the quantity of money and that countries that devote more time to studying the behavior of aggregate money supply rarely experience much variation in their economic activities. Others are suspicious about the role of money or gross national income [10]. The implication of the stability of the relationship between money and economic growth will show the effectiveness of monetary policy following the conventional Hicksian IS-LM analysis [11]. Moreover, Monetary policy is a deliberate measure by the government through the monetary authority, Central Bank of Nigeria (CBN) by the use of interest rate, direction of credits, supply of money etc, to regulate the level of activities in the economy in order to enhance price stability, economic growth and even investment for employment. However, the directions in monetary policy and particularly the emphasis on more reluctant and effective instruments came in the rate of deregulation of money market beginning from 1987 [12]. Monetary policy from then on wards laid greater emphasis on preventing money from becoming a major source of disturbance in the economy. Excessive monetary expansion is stabilizing security among other instruments. Monetary aggregates have at times been advocated as guide to monetary policy on the ground that they may have a fairly stable relationship with the economic growth and can be controlled to a reasonable extent by the central Bank, either through control over the supply of balances at the federal reserve of the federal fund rate. An increase in the federal fund rate (and other short-term interest rate, for example, will reduce the attractiveness of holding money balances relative to new higher yielding money market instruments and thereby reduce the amount of money demanded and slow growth of the money stock. There are a few measures of the money stock ranging from the transactions dominated M1 to the broader M2 and M3 measures, which include other liquid balances and these aggregates have different behaviors [13]. In discussing the concept of money supply and its impacts, two other issues often come to our mind, which is the state of inflationary pressure and the unemployment rate. 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 [14],[15],[16],[17],[18]. 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. This research work therefore, would review the technicalities involved in the control of money supply in Nigeria.

## Statement of the Problem

Study of this nature is always not comparable by the existence of certain problem. The major problem that trigged off this work is the recurrence of general price instability, persistent inflationary pressures and unemployment in the economy, in spite of the excess of monetary policy measures adopted and applied over the years.There is also this problem of general feeling that a continuous annual rate of money increases will adversely increase the rate of price level which will directly lead to inflation, which may deny the intended

effects of use of monetary policy measure to influence economic growth thus, requiring a policy response. Recently, these inflationary pressures have succeeded in bringing about devaluation in Nigeria's currency value as a result of expansionary measures of money supply. From the above issue, this research work will address the questions: What is the impact of money supply on economic growth in Nigeria.

## Objectives of the Study

The broad objective of the study is to examine the impact of broad money supply on economic growth in Nigeria, 1986 – 2019. Specifically, the study is set to:

1. To ascertain the impact of broad money supply on economic growth in Nigeria.
2. To determine the impact of ratio of private sector credit to GDP on economic growth in Nigeria.

## Research Questions

From the following objective of the study, the following research questions are use for the study:

1. To What the degrees have broad money supply impacted on economic growth in Nigeria?
2. To what extent does ratio of private sector credit impact to GDP on economic growth in Nigeria?

## Statement of Hypotheses

These hypotheses are meant to guide the study:

1. Broad money supply does not have positive and significant impact on economic growth in Nigeria.
2. The ratio of Private sector credit does not have positive and significant impact on economic growth in Nigeria.

## Significance of the Study

The research is significant to the following stakeholders: Policy Makers:The impact of financial deepening on economic growth is important as this will inform and update Nigeria policy makers to give priority to all policies o financial deepening and find ways through which financial deepening can be made more effective and efficient. This study will help formulate policies capable of enhancing the development of the financial sector. Investors: The result of the study would be of benefit to investment analysts and investors in examining the effectiveness of financial deepening and thus evaluating the option available for accessing long-term, short-term, non-debt financial capital which enables investors to avoid over reliance on debt financing.

# METHODOLOGY

## Research Design

The researcher adopted *ex-post facto* design. It examines past occurrences in order to understand a current state. Although this type of design involves both a dependent variable and an independent variable and the researcher cannot manipulate the latter. The choice of the *ex-post facto* design is because the research relied on already recorded events or historic data.

## Nature and Sources of Data

This study examined the impact of financial deepening on economic growth in Nigeria. The data used for the study is secondary in nature. It is adopted for this study as it helps to improve the understanding of the problem under study. Secondary data such as market capitalization, credit to private sector, broad money supply, economic volatility and Gross Domestic Product were collected from the Central Bank of Nigeria (CBN) Statistical Bulletin within the time frame of 1986-2019. The estimation technique was based on the nature of data

used for the study. The data set is used because it elicits the requisite information needed to achieve the objectives of the study as well as attend to the problem generated in the study.

## Model Specification

The model of the study is based on the classical regression model of Brooks (2014). The model is shown as follows;

$$GDP = F(M_2, RCPSGDP) \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Where:

GDP = Gross Domestic Product

$M_2$ = Broad Money Supply

RCPSGDP = Ratio of Credit to the Private Sector to GDP

In a regression form, it will become:

$$GDP_t = \beta o + \beta_1 M_{2t} + \beta_2 RCPSGDP_t + \mu \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

$\beta o$ = Constant Term

$\beta_1$ = Coefficient of Broad Money Supply

$\beta_2$ = Coefficient of Ratio of Credit to the Private Sector to GDP

$\mu$ = Error Term

## Description of Model Variables

### Broad Money Supply

Money supply is a basic macroeconomic element that influences economic growth in an economy by ensuring effective running of economic activities in both public and private sectors through liquidity availability. It is defined as the total amount of monetary asset available in an economy at a specific time.

### Ratio of Private Sector Credit to GDP

This refers to financial resources provided to the private sector by financial corporations, through loans, purchases of non equity securities, and trade credits and other accounts receivable, that establish a claim for repayment.

$$RCPSGDP: = \frac{CPS}{GDP}$$

### Gross Domestic Product

Gross domestic product (GDP) is the total monetary or market value of all the finished goods and services produced within a country's borders in a specific time period. As a broad measure of overall domestic production, it functions as a comprehensive scorecard of a given country's economic health.

## Method of Data Analysis

The study is set to adopt unit root test, descriptive statistics, autocorrelation test and heteroskeidasticity test as preliminary tests. Unit root test was used to measure the stationarity properties of the variables, descriptive statistics was used to ascertain the individual characteristics of the variables, autocorrelation test was used to determine the presence/absence of autocorrelation in the regression model while heteroskeidasticity test measures whether the variance of a regression model is constant (that is, homoskeidastic). Bound test is used to identify whether a long run effect exists exists between the independent variables and the dependent variable under study. On the other hand, ordinary least square is used as the analytical technique to ascertain the impact of financial deepening indicators on economic growth of Nigeria.

## DATA PRESENTATION, ANALYSIS, DISCUSSION OF FINDINGS.

### Data Presentation

Data for the study, sourced from the annual statistical bulletin were presented, tested and analyzed. The data collected were organized and used for testing the hypotheses. From the analysis and results generated, deductions and logical conclusions were obtained.

The abbreviations used to signify the variables of study in all the tables are shown in the appendix.

Table 1: showing the data for the study

| YR | M2 | RCPSGDP | GDP |
|---|---|---|---|
| **1986** | 34.89 | 0.49819 | 1151086 |
| **1987** | 44.21 | 0.51036 | 1119063 |
| **1988** | 48.11 | 0.49032 | 1216464 |
| **1989** | 50.76 | 0.39051 | 1461131 |
| **1990** | 45.9 | 0.44339 | 1797376 |
| **1991** | 52.86 | 0.48811 | 1812277 |
| **1992** | 75.4 | 0.50563 | 1627060 |
| **1993** | 111.11 | 0.64182 | 1698859 |
| **1994** | 165.34 | 0.6248 | 1877736 |
| **1995** | 230.29 | 0.50072 | 2424108 |
| **1996** | 289.09 | 2.74132 | 48233 |
| **1997** | 345.85 | 0.5179 | 1289552 |
| **1998** | 413.28 | 0.52434 | 1577290 |
| **1999** | 488.15 | 0.49686 | 1802008 |
| **2000** | 628.95 | 0.54165 | 2079862 |
| **2001** | 878.46 | 0.46155 | 3423819 |
| **2002** | 1269.32 | 0.79263 | 2333017 |
| **2003** | 1505.96 | 0.73509 | 2983621 |
| **2004** | 1952.92 | 6.54853 | 3439915 |
| **2005** | 2131.82 | 0.54644 | 3690295 |
| **2006** | 2637.91 | 0.30277 | 1244030 |
| **2007** | 3797.91 | 0.00663 | 1330771 |
| **2008** | 5127.4 | 9.7756 | 1784490 |
| **2009** | 8008.2 | 0.60613 | 2171807 |
| **2010** | 9411.11 | 0.14274 | 2575117 |
| **2011** | 11034.94 | 0.094913 | 2558562 |
| **2012** | 12172.49 | 0.05736 | 2399822 |
| **2013** | 13895.39 | 0.08211 | 2490578 |
| **2014** | 15160.29 | 0.00241 | 3143338 |
| **2015** | 17679.29 | 0.00477 | 3486691 |
| **2016** | 18901.3 | 8.68707 | 2.73E+08 |
| **2017** | 21827.33 | 0.96605 | 3.35E+08 |
| **2018** | 25072.11 | 0.77429 | 4.12E+08 |
| **2019** | 2.96E+04 | 0.54401 | 6.44E+08 |

Source: CBN Statistical Bulletin

NB:

$M_2$ = Broad Money Supply

RCPSGDP = Ratio of Credit to the Private Sector to GDP

GDP = Gross Domestic Product

Table 1 showed the data comprising of broad money supply, ratio of credit to the private sector to GDP and gross domestic product.

Table 2: Description of the Characteristics of the Variables under Study

| Variables | Skewness | Kurtosis | Jarque-Bera Stat. | Probability | Obs. |
|---|---|---|---|---|---|
| **$M_2$** | -1.455006 | 3.443851 | 18.05244 | 0.000120 | 35 |
| **RCPSGDP** | 1.012772 | 3.194700 | 8.626536 | 0.013390 | 35 |
| **GDP** | -1.956413 | 5.366624 | 43.56483 | 0.000000 | 35 |

Source: Author's Computation from Eviews 9.0

Table 2 contains the description of the variables using normality test which comprises of Skewedness, Kurtosis and Jarque – Bera Statistics.Jarque – Bera (JB) tool Statistics was used to determine whether or not fluctuations in financial deepening follow the normal probability distribution. The (JB) tool of normality is a large sample or asymptotic tool that computes kurtosis and skewedness measures. The researcher therefore examined the sample mean, standard deviation, skewedness, kurtosis and Jarque – Bera statistics as well as the P – value.

Table 3: Descriptive Statistics Output

| | M2 | RCPSGDP | EV | GDP |
|---|---|---|---|---|
| Mean | 13.02348 | 13.44680 | 14.36518 | 13.42102 |
| Median | 15.47941 | 12.59756 | 16.36428 | 15.41725 |
| Maximum | 19.36248 | 18.79936 | 19.97593 | 19.57493 |
| Minimum | 0.038315 | 10.88215 | 0.050657 | 0.247198 |
| Std. Dev. | 6.123764 | 2.106340 | 6.214555 | 4.965419 |
| Skewness | -1.455006 | 1.012772 | -1.660496 | -1.956413 |
| Kurtosis | 3.443851 | 3.194700 | 4.080973 | 5.366624 |
| Jarque-Bera | 18.05244 | 8.626536 | 24.90323 | 43.56483 |
| Probability | 0.000120 | 0.013390 | 0.000004 | 0.000000 |
| Sum | 651.1740 | 672.3402 | 703.8941 | 671.0511 |
| Sum Sq. Dev. | 1837.524 | 217.3968 | 1853.793 | 1208.114 |
| Observations | 35 | 35 | 35 | 35 |

From the result in table 3, descriptive statistics indicates that from 1986 to 2019 all the variables show an average positive mean value from 14.36518 to 10.5717077. The standard deviation shows that the highest standard deviation of (6.123764) is recorded by money supply while the least standard deviation of (2.106340) is recorded by ratio of credit to private sector to GDP. The skewedness statistics from the table reviewed that one of the variables is positively skewed while two variables are skewed negatively. The kurtosis coefficient shows that all the variables are leptokurtic as their kurtosis value are greater than three (3). The probability of Jarque-Bera tool of normality for the variables indicate that all the variables have values less than 5% level of significance showing that all the variables are normally distributed.

Unit Root Test

This test tries to examine the property of the variables. It is used to check for the presence of a unit root i.e. whether the variables are stationary. Economic variables are generally non – stationary and they are a random process. Linear combination of non – stationary series in general is a non – stationary series and closely associated with economic theory. Because economic theory guarantees stagnation of combination of economic variables, in this study Dickey Fuller's

generalize Test for investigation of stationary variables is used. In order to assess the time series properties of the data, unit root test was conducted. As Engle and Granger (1987) argued, if individual time series data are non – stationary, their linear combinations could be stationary if the variables were integrated of the same order. The assumption is stated as follows: if the absolute value of the Augmented Dickey Fuller (ADF) test is greater than the critical value either at 1%, 5% or 10% level of significance at order zero, one or two, it shows that the variable under considerations is stationary otherwise it is not. The results of the Augmented Dickey Fuller (ADF) test shows that all variables are stationary at level or integrated of order one at 5% level of significance. The ADF is carried out using E-views software package and the results from the test are tabulated below:

LLC = Levin, Lin and Chu Test
IPS = Im, Pesaran and Shin W – Stat
ADF FISHER = Augmented Dickey Fuller Fisher Chi – Square Test
PP FISHER = Philip Peron Fisher Chi – Square Test

Table 4 showed that all the variables are stationary at level or integrated of order one.

| **Variable** | **LLC** | | **ADF – FISHER** | | **PP – FISHER** | |
|---|---|---|---|---|---|---|
| | Test Stat. | Order of integration | Test Stat. | Order of integration | Test Stat. | Order of integration |
| **$M_2$** | -4.75 (0.0000 < 0.05) | I(1) | 33.41 (0.0002< 0.05) | I(I) | 71.18 (0.0000 < 0.05) | I(I) |
| **RCPSGDP** | -10.01 (0.0000< 0.05) | I(1) | 22.44 (0.0130<0. 05) | I(1) | 52.60 (0.0000< 0.05) | I(1) |
| **GDP** | -5.31 (0.0000 < 0.05) | I(I) | 31.78 (0.0004< 0.05) | I(I) | 65.87 (0.0000 < 0.05) | I(I) |

*Source: Author's Compilation from Eviews 9*

Test of Hypotheses

The test of hypothesis was carried out as follows:
Step 1: Re-statement of the hypothesis in the null and alternate forms
Step 2: Statement of decision criteria
Step 3: Presentation of test result
Step 4: Decision
Test of Hypothesis one
Step 1: Restatement of the hypothesis.
Broad money supply does not have positive and significantly impact on economic growth in Nigeria.
Step 2: Statement of Decision Criteria
Reject $H_0$ if the t-statistics is >2.0 and the probability of the t-statistics is <0.05.
Step 3: Presentation of test result

Table 5: Test of Hypothesis One

| | | | | |
|---|---|---|---|---|
| Dependent Variable: GDP | | | | |
| Method: Least Squares | | | | |
| Date: 12/15/20 Time: 09:43 | | | | |
| Sample: 1986 2019 | | | | |
| Periods included: 35 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | 60238430 | 96535343 | 0.624004 | 0.5357 |
| $M_2$ | 1161182. | 28176794 | 4.041211 | 0.0073 |
| R-squared | 0.897065 | Mean dependent var | | 1.23E+08 |
| Adjusted R-squared | 0.775083 | S.D. dependent var | | 5.04E+08 |
| S.E. of regression | 5.07E+08 | Akaike info criterion | | 43.00447 |
| Sum squared resid | 1.18E+19 | Schwarz criterion | | 43.15743 |
| Log likelihood | 1071.112 | Hannan-Quinn criter. | | 43.06272 |
| F-statistic | 9.757305 | Durbin-Watson stat | | 1.735760 |
| Prob(F-statistic) | 0.000843 | | | |

*Source: Author's Computation from E-View 9.0*

Table 5: General Result

The F – Statistics shows that the overall estimate of the regression has a good fit and is statistically significant. The $R^2$ (R – squared) which measures the overall goodness of fit of the entire regression indicates a 89.7% value while the adjusted $R^2$ 77.5% hence implying that the independent variable explain the dependent variable to the tune of 77.5%. Also the Durbin Watson (DW) statistics DW = 1.735760 which hovers around 2.0 showing absence of autocorrelation. It equally showed that the F-statistic is 9.757305 which is greater than 2.5 while the probability value being 0.000843 is less than 5% indicating that the overall regression is statistically significant. From the result table, the coefficient of the variable broad money supply and GDP indicate positive sign and statistically significant at 5% critical level. Thus, there is a strong relationship between broad money supply and GDP in the short run. This implies that, a percentage change (increase) in broad money supply will lead to an increase in GDP.

Step 4: Decision

Given the decision criteria to reject $H_o$ if the t-statistics is >2.0 and the probability of the t-statistics is < 0.05. Table 4. shows the t-statistics of M2 as 4.041211>2.0 with a probability of the t-statistics of 0.0073< 0.05. We reject the null hypothesis (H0) and conclude that broad money supply has positive and significantly impact on economic growth in Nigeria.

Test of Hypothesis Two

Step 1: Restatement of the hypothesis.
The ratio of Private sector credit to GDP does not have positive and significant impact on economic growth in Nigeria.

Step 2: Statement of Decision Criteria
Reject $H_o$ if the t-statistics is >2.0 and the probability of the t-statistics is <0.05.

Step 3: Presentation of test result

Table 6: Test of Hypothesis Two

Dependent Variable: GDP
Method: Least Squares
Date: 12/15/20 Time: 09:43
Sample: 1986 2019
Periods included: 35

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 60238430 | 96535343 | 0.624004 | 0.5357 |
| RCPSGDP | 2410.176 | 15421.54 | 3.156286 | 0.0265 |

| | | | |
|---|---|---|---|
| R-squared | 0.897065 | Mean dependent var | 1.23E+08 |
| Adjusted R-squared | 0.775083 | S.D. dependent var | 5.04E+08 |
| S.E. of regression | 5.07E+08 | Akaike info criterion | 43.00447 |
| Sum squared resid | 1.18E+19 | Schwarz criterion | 43.15743 |
| Log likelihood | 1071.112 | Hannan-Quinn criter. | 43.06272 |
| F-statistic | 9.757305 | Durbin-Watson stat | 1.735760 |
| Prob(F-statistic) | 0.000843 | | |

*Source: Author's Computation from E-View 9.0*

Step 4: Decision

Given the decision criteria to reject $H_o$ if the t-statistics is >2.0 and the probability of the t-statistics is < 0.05. Table 4.3.2 shows the t-statistics of RCPSGDP as 3.156286>2.0 with a probability of the t-statistics of 0.0265 < 0.05. We reject the null hypothesis (H0) and conclude that the ratio of Private sector credit to GDP has positive and significant impact on economic growth in Nigeria.

## Discussion of Findings

In hypothesis one, the study discovered that broad money supply has positive and significantly impact on economic growth in Nigeria due to the fact that the t-statistics of M2 which was 4.041211 was greater than 2.0 while the probability being 0.0073 was less than 0.05. This discovery is in agreement with the findings of [3] who carried out a study on the impact of broad money supply on Nigerian economic growth from 1987 to 2010. They disocvered that there is a positive and significant relationship between money supply and economic growth in Nigeria. [1] also supported this disocvery in their finding which stated that money supply and interest rate have positive and significante impact on economic growth. The authors studied the impact of money supply on economice growth in Nigeria. The researcher discovered that the ratio of Private sector credit to GDP has positive and significant impact on economic growth in Nigeria based on the premise that the t-statistics being 3.156286 was greater than 2.0 while the probability value being 0.0265 was less than 0.05. This discovery is in agreement with the finding of [5]. The authors studied the impact of private sector credit on economic growth in Nigeria from 1993 to 2013 and found out

that private sector credit increased economic growth when domestic or local conditions were favorable and the absorptive capacity of the domestic economy for credit was estimated at 29% of the GDP in 2013. [5], also supported this discovery in their finding where they disovered that there is a positive and statistically significant effect of private sector credit on output. They investigated the impact of private sector credit on economic growth in Nigeria from 2000 to 2014

## CONCLUSION

The conclusion drawn from this study is that the economic growth and financial deepening in Nigeria following the supply-leading hypothesis and not the demand-following, feedback, or neutral hypotheses. The policy implication of this finding is that to grow the Nigerian economy attention must be given to the level of development of the financial system as it may boost the capital accumulation efficiency and/or increase the level of savings and thus investment. It was finaly concluded that broad money supply and ratio of Private sector credit to GDP has positive and significant impact on economic growth in Nigeria.

## RECOMMENDATIONS

The following recommendations are made for this study:The CBN should be made more effective in its monetary management by making all financial markets organized so as to accentuate the effects of monetary policy variables like Broad money supply. This promotes real GDP in Nigeria. The government should encourage Monetary authorities like the Central Bank of Nigeria to build a conducive and enabling environment for friendly interest rates so that prospective investors can increase their investment and raise the nation's production capacity. This can be achieved through low unremunerated reserve requirements and adequate physical and financial infrastructure to remove the impediments that lead to the gap between the savings and lending rate. This is because the interest rate is the stimulating factor in savings and investment decisions in the economy.Attempts should be made by the government to improve on its infrastructure in order to reduce cost of production and increase exportation so as to achieve the objective of naira devaluation. This adds to the country's national income and in general promotes the real GDP.

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Appendix1
Showing the data for the study

| YR | M2 | RCPSGDP | GDP |
|---|---|---|---|
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| **1987** | 44.21 | 0.51036 | 1119063 |
| **1988** | 48.11 | 0.49032 | 1216464 |
| **1989** | 50.76 | 0.39051 | 1461131 |
| **1990** | 45.9 | 0.44339 | 1797376 |
| **1991** | 52.86 | 0.48811 | 1812277 |
| **1992** | 75.4 | 0.50563 | 1627060 |
| **1993** | 111.11 | 0.64182 | 1698859 |
| **1994** | 165.34 | 0.6248 | 1877736 |
| **1995** | 230.29 | 0.50072 | 2424108 |
| **1996** | 289.09 | 2.74132 | 48233 |
| **1997** | 345.85 | 0.5179 | 1289552 |
| **1998** | 413.28 | 0.52434 | 1577290 |
| **1999** | 488.15 | 0.49686 | 1802008 |
| **2000** | 628.95 | 0.54165 | 2079862 |
| **2001** | 878.46 | 0.46155 | 3423819 |
| **2002** | 1269.32 | 0.79263 | 2333017 |
| **2003** | 1505.96 | 0.73509 | 2983621 |
| **2004** | 1952.92 | 6.54853 | 3439915 |
| **2005** | 2131.82 | 0.54644 | 3690295 |
| **2006** | 2637.91 | 0.30277 | 1244030 |
| **2007** | 3797.91 | 0.00663 | 1330771 |
| **2008** | 5127.4 | 9.7756 | 1784490 |
| **2009** | 8008.2 | 0.60613 | 2171807 |
| **2010** | 9411.11 | 0.14274 | 2575117 |
| **2011** | 11034.94 | 0.094913 | 2558562 |
| **2012** | 12172.49 | 0.05736 | 2399822 |
| **2013** | 13895.39 | 0.08211 | 2490578 |
| **2014** | 15160.29 | 0.00241 | 3143338 |
| **2015** | 17679.29 | 0.00477 | 3486691 |
| **2016** | 18901.3 | 8.68707 | 2.73E+08 |
| **2017** | 21827.33 | 0.96605 | 3.35E+08 |
| **2018** | 25072.11 | 0.77429 | 4.12E+08 |
| **2019** | 2.96E+04 | 0.54401 | 6.44E+08 |

Source: CBN Statistical Bulletin

Appendix II: Descriptive Statistics Output

| | M2 | GDP |
|---|---|---|
| Mean | 13.02348 | 13.42102 |
| Median | 15.47941 | 15.41725 |
| Maximum | 19.36248 | 19.57493 |
| Minimum | 0.038315 | 0.247198 |
| Std. Dev. | 6.123764 | 4.965419 |
| Skewness | -1.455006 | -1.956413 |
| Kurtosis | 3.443851 | 5.366624 |
| Jarque-Bera | 18.05244 | 43.56483 |
| Probability | 0.000120 | 0.000000 |
| Sum | 651.1740 | 671.0511 |
| Sum Sq. Dev. | 1837.524 | 1208.114 |
| Observations | 35 | 35 |

Appendix III: Output of Unit Root Tests
Broad Money Supply

Panel unit root test: Summary
Series: D(M2)
Date: 12/15/20 Time: 09:43
Sample: 1986 2019
Exogenous variables: None
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

| Method | Statistic | Prob.** | Cross-sections | Obs |
|---|---|---|---|---|
| Null: Unit root (assumes common unit root process) | | | | |
| Levin, Lin & Chu t* | -4.75341 | 0.0000 | 5 | 35 |
| Null: Unit root (assumes individual unit root process) | | | | |
| ADF - Fisher Chi-square | 33.4101 | 0.0002 | 5 | 35 |
| PP - Fisher Chi-square | 71.1797 | 0.0000 | 5 | 40 |

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Ratio of Private Sector Credit to GDP

Panel unit root test: Summary
Series: D(RCPSGDP)
Date: 12/15/20 Time: 09:43
Sample: 1986 2019
Exogenous variables: None
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

| Method | Statistic | Prob.** | Cross-sections | Obs |
|---|---|---|---|---|
| Null: Unit root (assumes common unit root process) | | | | |
| Levin, Lin & Chu t* | -10.01640 | 0.0000 | 5 | 35 |
| Null: Unit root (assumes individual unit root process) | | | | |
| ADF - Fisher Chi-square | 22.4437 | 0.0130 | 5 | 35 |
| PP - Fisher Chi-square | 52.6026 | 0.0000 | 5 | 40 |

** Probabilities for Fisher tests are computed using an asymptotic Chi square distribution. All other tests assume asymptotic normality.

Gross Domestic Product

Panel unit root test: Summary
Series: D(GDP)
Date: 12/15/20 Time: 09:43
Sample: 1986 2019
Exogenous variables: None
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

| Method | Statistic | Prob.** | Cross-sections | Obs |
|---|---|---|---|---|
| Null: Unit root (assumes common unit root process) | | | | |
| Levin, Lin & Chu t* | 5.31612 | 0.0000 | 5 | 35 |
| Null: Unit root (assumes individual unit root process) | | | | |
| ADF - Fisher Chi-square | 31.7844 | 0.0004 | 5 | 35 |
| PP - Fisher Chi-square | 65.8699 | 0.0000 | 5 | 40 |

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.