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AN EMPIRICAL INVESTIGATION INTO THE EFFECT OF MONETARY POLICY ON ECONOMIC GROWTH IN NIGERIA

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ABSTRACT

This study examines the effect of money supply, prime lending rate on economic growth in Nigeria through the application of Augmented Dickey-Fuller technique in testing the unit root property of the series. Data for the study were extracted from the CBN statistical bulletins for the period spanning from (2006 – 2019). Descriptive statistics, cointegration and regression analysis techniques were used to analyses the data. The results of unit root test indicated that all the variables in the model are stationary at d(1) first difference which necessitate cointegration test in order to find out if there are long relationship between the variables. The results revealed that trace statistic indicated 2 cointegration between the variables. A major policy implication of this result is that economic growth is function of money supply and prime lending rate, effective monetary policies should direct on manipulating instruments and importance should be placed on justification for adopting a particular policy should be rationalized in order to increase growth in economy. The study recommends that CBN should redefine the monetary policy instrument, CBN should also set the lending rate at optimum level as these would assist to boost credit expansion, loan and advance and invariable returns and profit abilities of DMBs in Nigeria.

Keywords: Economic Growth, Money Supply, Prime Lending Rate

1. INTRODUCTION

Over some years, the Nigerian economy has undergone various level of structuring to ensure functional, economic strength, better governance, and solution its challenges while providing better harnessing of opportunities. In Nigeria monetary

policy have become important instruments for regulating the economy of country, while setting monetary or exchange rate policies in order to stabilize growth and employment using the money supply, interest rate and exchange rates as tools to achieve those objectives as state by Fisher and Whitley (2000) and Mellis and Whittaker (2000). Rodrik (2009) proves that GDP is affected by currency, exchange rates (exchange rate) of a particular country while Udoka and Roland (2012) states that the interest rate is one of the determinants of economic growth.

The Nigeria economy has continued to remain underdeveloped regardless of enormous natural and human resource available in the country. Unemployment and inflation has become the order of day. The situation in Nigeria is quite alarming. The various monetary policies set by government fail to achieve the its primary objective of price stability, reduction in unemployment and sustained economy growth.

The link between money supply and economic growth has been receiving substantial attention in the field of monetary economics nowadays. This is so because of the significance of economic growth among the macro-economic objectives of developing countries like Nigeria. Persistent attention has always been given among monetary economist including Fry (1995), Mathieson (1980) and Odedokun (1996) to the link between money supply and output. While there is universal agreement among Economist that quantity of money is the most important determinant of economic growth but vary on the effect of money supply on economic growth (Handler, 1997) while some are unconvinced about the function of money or gross national income Robinson (1952).

Udoka and Roland (2012) state that interest rates are one of the determinants of economic growth of a Country; though interest rates is negatively correlated with GDP. A raise in interest rates will usually lead to a reduction in real growth rate; this was in line with the research findings conducted in Europe by (Giovanni et al., 2009). Fisher (1999) and Bardhan (1997) among others provides statement of the issues involved and discourse the various implications of received interest in monetary aggregate in the determination of the level economic growth in developing countries.

2. LITERATURE REVIEW

Understanding the factors and causes of fluctuation in economic growth, especially money supply, prime lending rate and exchange rate is an important challenge to empirical macroeconomist. The major challenge to the current studies in developed nation was the notion of whether or not stabilization without recession is not possible.

While a number of theoretical models pointing that stabilization could be expansionary more especially to the countries that experienced high inflation Kamin et al (1998), while others maintained that stabilization is impossible without recession.

Monetary policy variables belong to the realm of normative macroeconomics, which study various economic factors that include information on aggregate indicators. These factors commonly include a government fiscal or monetary policy, which can include information on interest rate, money supply and exchange rate that drive market liquidity. In most developing countries (as Nigeria), the central bank is saddle with the responsibility for watching, monitoring, planning, setting, implementing and controlling of monetary policies such as interest rate, money supply and exchange rate as require by the law.

Theories Gross Domestic Product (GDP)

As state by Haggart (2000), GDP is a good indicator of macroeconomic status and country's development, therefore GDP can be calculated from the perspective of income and expenditure as confirm by (Andolfatto, 2005) and (McConnel and Brue, 2008).

Great Spurt Theory

This theory asserts that for a developing country to be able to improve their economic levels to modern industrial economy they require shape break with the previous or great spurt of industrialization Balami (2006). The Great Spurt theory stated that the level of countries industrialization differs from one country to other depending on backwardness level. The theory also states that capital intensive mode of production lead to the great spurt.

The New Growth Theory

This theory focuses on two important points. First of all, it considers technological advancement and development as product of economic activity contrary to slow growth model that consider technology as a product of non-market forces. Secondly, the theory state that technology is characterize by increase in returns which in turn drive the process of economic growth (Balami ,2006)

The Slow Growth Model

This model related GDP with population increase, investment and technical process. This model has assumption of full employment with aggregate production base on the constant return. The slow growth model also has the assumption that saving has

positive linear relationship with level of income, capital formation and investment is simply the rate of increase in capital. In evaluating the rate of economic growth, demand and supply side of the economy was combining together to generate economic growth by (Balami,2006). He also supported the neo- classical growth model which state that $Q = f(AK^{\alpha} L^{1-\alpha})$.

Empirical Review

This section aims at reviewing related empirical literature on the relationship between the monetary policy and economic growths were reviewed. Empirical findings from this study indicate that Adigwe, Echekoba & Onyeagba (2015) observed the effects of monetary policy using the regression technique of the Ordinary Least Square Method (OLS) on the Nigerian economy and data spanning from period 1980- 2010. The findings shows that monetary policy proxy by money supply exerts a positive impact on GDP growth but negative impact on the rate of inflation.

Nasko (2016) studied the effects of monetary policy using multiple using regressions and time-series data covering the period from 1990-2010 on economic growth in Nigeria were employed to analyze data on variables such as interest rate, money supply, financial deepening and gross domestic product. They were all revealed to have marginal effects on the economic growth of Nigeria. The study reveals more, the purposes and objectives of monetary policy, which comprises maintenance of balance of payment equilibrium, price stability, full employment and economic growth. The study found marginal impact on growth due to change in monetary policy application. Ahmad, Afzal and Ghani (2016) observed the effects of monetary policy on economic growth in Pakistan using annual time-series data covering the range of 1973 to 2014 and Autoregressive Distribution Lag (ARDL) Cointegration approach and an were used to differentiate the robust among the variables with specification of long-run and short-run. Empirical findings also revealed long-run relationship among variables exchange rate and money supply, which positively effects economic growth.

Fasanya, Onakoya and Agboluaje (2013) observed the effects of monetary policy on economic growth in Nigeria using time-series data spanning from the period of 1975 -2010.The impact of stochastic shocks of each of the endogenous variables are discovered using Error Correction Model (ECM). The study indicates that long run relationship exists among the variables. Similarly, the core discovery of this work revealed that exchange rate, inflation rate, and external reserve are significant

monetary policy instruments that drive growth in Nigeria. Usman and Adejare (2014), observes the effect of monetary policy on industrial growth in Nigerian economy, multiple regressions were used to analyze data on such variables, Treasury Bills, manufacturing output, leading & deposit and Rediscount Rate for Nigeria from the period of 1970-2010 were all shown to have significant impact on the industrial Growth with the Adjusted R^2 of 0.8156 (81.56%). The research concluded that Treasury Bills has the negative impact on industrial output while Deposit and Rediscount rate have significant positive effect on industrial output but. All the variables are statistically significant.

Mbutor and Uba (2013) study the effects of financial inclusion on monetary policy in Nigeria from the period of 1980 - 2012. The result supports the notion that growing financial inclusion would increase the effectiveness of monetary policy. Onyeiwu (2012) study the effects of monetary policy on the Nigerian economy using a regression model of the Ordinary Least Squares Method (OLS) to analyze data from 1981 - 2008. The result of the analysis revealed that monetary policy has negative impact on rate of inflation and money supply exerts a positive impact on Balance of Payment and GDP growth but Charles-Anyaogu (2012), in his study observed the performance of monetary policy on the manufacturing index performance in Nigeria. The data were extracted from the CBN 2010 statistical bulletin were subjected to econometric test procedures such as diagnostic test, unit root for stationarity of series, and granger causality to investigate the impact of some macroeconomic variables on the Manufacturing index in Nigeria while VEC and OLS estimation were used to study the models for significance, direction, magnitude and relationship among the variables. The study discovered that MS positively affect MANDEX by 0.5% while others played negative impact to the performance of the manufacturing sector over the years.

Chuku (2009), carried out a controlled experiment using a structural vector autoregression (SVAR) model to trace the impacts of monetary policy shocks on output and prices in Nigeria SVAR. Fasanya, Onakoya and Agboluaje (2013) study the effects of monetary policy on economic growth in Nigeria. The effects of stochastic shocks of each of the endogenous variables are explored using Error Correction Model (ECM). The study uses time-series data covering the range of 1975 - 2010. The study shows that Long run relationship exists among the variables. Also, the major finding of this study revealed that exchange rat, inflation rate, and external reserve are significant monetary policy instruments that drive growth in

Nigeria. Onyeiwu (2012), observes the effects of monetary policy on the Nigerian economy. Ordinary Least Squares Method (OLS) were used to analyze data from 1981 to 2008. The result of the analysis indicates that monetary policy proxy by money supply has positive effects on GDP growth and Balance of Payment but negative impact on rate of inflation. The study comes to conclusion that the quantity of money (M2) in the economy is the most influential instrument for monetary policy implementation.

The Conceptual Framework of the Study

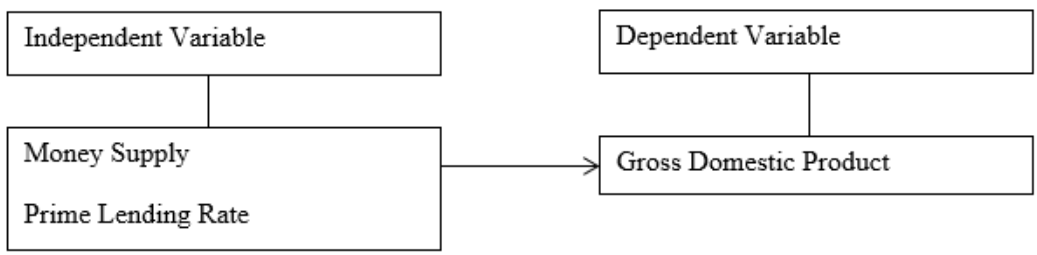

Fig. 1: Conceptual Framework

3. METHODOLOGY

This section aims in specifying models adopted in this study. For the purpose of this study, the quantitative research design was used. Following the 2004 banking consolidation reform programmed of CBN of Nigeria, the target population is for this study consist of the all (23) deposit money banks in Nigeria. EViews 11 software was used for the analysis of this studies.

Linear Regression model

This study adopted the use of multiple regression analysis. This model was form from the functional and linear relationship that exist between the research variables, from the theoretical and literature review in the previous chapter, it is observed that there was a causal link between M2 and PLR on deposit money banks in Nigeria. The model is to verify the effect of monetary policy on gross domestic product in Nigeria.

The ordinary least square (OLS) is given by the formula below.

The model is specified as: GDP = f (M2 + PLR).....(1)

Therefore GDP $= \beta_0 + \beta_1 + M2_1 + \beta_2 + PLR_2 + U_t$…….....(2)

Where M2 is money supply and Prime Lending Rate is exchange rate.
Where;
GDP = Gross Demotic Product
M2 = Money Supply
PLR = Prime Lending Rate
B0, β1, and β 2 – Parameters
U_t - Error term (white noise)

A' priori expectation
It is expected that: $B_1 < 0$, and $B_2 > 0$

4. RESULTS AND DISCUSSION

This section presents the analysis and interpretation of result from the data collected from the CBN statistical bulletins. The OLS regression and cointegration are also explained in this section.

Table 1
Descriptive Statistics

	GDP	M2	PLR
Mean	78916.97	1.69E+08	16.81500
Median	75903.25	1.56E+08	16.85500
Maximum	144210.5	3.32E+08	18.99000
Minimum	28662.47	19665775	15.14000
Std. Dev.	38033.82	98832863	0.914606
Skewness	0.331371	0.137747	0.436552
Kurtosis	1.914984	1.827464	3.956050
Jarque-Bera	0.942949	0.846264	0.977866
Probability	0.624081	0.654992	0.613280
Sum	1104838.	2.37E+09	235.4100
Sum Sq. Dev.	1.88E+10	1.27E+17	10.87455
Observations	14	14	14

Source: Authors' analysis using Eviews 11 software

The descriptive statistics is presented in Table 1 where minimum, maximum, mean, median, Skewness, Kurtosis, Jarque-Bera, Probability, sum, Sum Sq. Dev and standard deviation of the data for the variables used in the study are described. The

minimum and maximum values of GDP are 28662.47 and 144210.5 with an average of 78916.97. M2 and PLR, vary from a minimum of 19665775 and 15.14000 and maximum of 3.32E+08 and 18.99000 with an average of 1.69E+08 and 16.81500 respectively. All the variables are positively skewed and the probability levels for all the variables at 5% are insignificant.

Trend Analysis

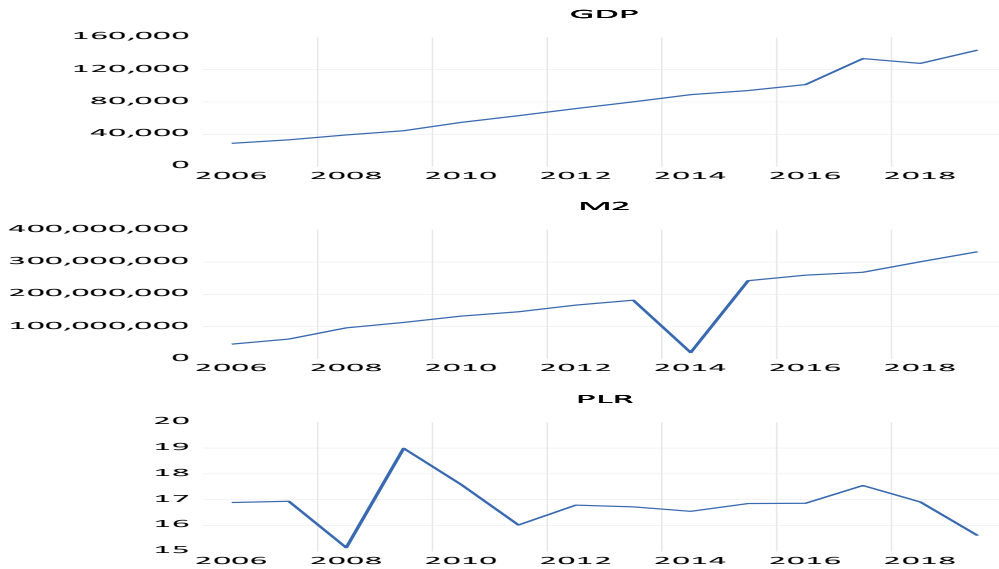

Figure. 1: Trend Analysis

Source: Generated by the Author from the Data Extracted from CBN Statistical Bulletin, 2018.

It is imperative that the trend analysis of GDP be conducted on the monetary policy variables. The monetary policy examine are the money supply and prime lending from 2006 to 2018.

Table 2
Unit Root Test

Variables	Stationary	ADF Statistic	Probability	Critical Value
GDP	(d(1))	-4.126926	0.0384	1%level -5.124875 5%level -3.933364 10%level -3.420030
M2	(d(1))	-5.182217	0.0076	1%level -4.992279 5%level -3.875302 10%level -3.388330
PLR	(d(1))	-4.931605	0.0130	1%level -5.124875 5%level -3.933364 10%level -3.420030

Source: Authors' analysis using Eviews 11 software

The results of the unit root test in Table 2 above indicated that all the variables are stationary at first difference (d (1)). The Augmented Dickey-Fuller test statistic value for gross domestic product is -4.126926 and the critical values are -5.124875, -3.933364 and -3.420030 at 1, 5 and 10 percent level respectively. The Augmented Dickey-Fuller test statistic for money supply is -5.182217 and the critical values are -4.992279, -3.875302 and -3.388330 at 1, 5 and 10 percent respectively. The Augmented Dickey-Fuller test statistics for prime lending rate is -4.931605 and the critical values are level -5.124875, -3.933364 and -3.420030 at 1, 5 and 10 percent respectively. Base on the result obtained by comparing the Augmented Dickey-Fuller test statistic values with the correspondent critical values at 1, 5, and 10 percent all the probability are statistically significant.

Table 3
Cointegration Test

Dependent Variables	Independent Variables	Trace Statistic	Critical value	Probability	Lags Interval	cointegrating
GDP	M2, PLR	6.957922	3.841465	0.0083	1,1	2

Source: Authors' analysis using Eviews 11 software

The Johansen cointegration test results in Table 3 above confirmed the existence of long run relationship between Gross Domestic Product, Money Supply and Prime Lending Rate in Nigeria as indicated by the TRACE-statistic 6.957922. The TRACE-

statistics results revealed that there is 2 cointegrating equation at 5percent level with critical value of 3.841465.

Table 4
Regression Result

Dependent Variable	Independent Variable	Coefficient	T Statistics	Prob.	F Statistics	Prob.	R^2	Adj R^2	DWn Statistics
GDP	M2	0.000324	5.29	0.0003	14.33	0.000864	0.72	0.67	1.85
	PLR	-2511.881	-0.38	0.7118					
	C	66333.68	0.587487	0.5687					

Source: Authors' analysis using Eviews 11 software

Table 4 present the OLS results for the dependent variables. The probability of F-statistics is 14.33223 with P-value of 0.000864. This means that the model is suited for the study, as the value is less than 1%. R^2 of 0.72 indicates that 72% of the variation in the dependent variable (GDP) is jointly explained by the independent variables (M2 and PLR). This position was also good after testing the adjusted R^2. Adjusted R^2 was maintained at 0.67 value, which implies that after adjusting for the error term the R^2 still remain significant at 67%.

From table 4, there is positive significant relationship between the money supply and gross domestic product. The coefficient of money supply is 0.000324 which implies that one percent change in M2 will increase the GDP 0.0324 percent. The null hypothesis which states that money supply has no significant effect on the GDP was rejected.

Similarly, table 4 also indicated the negative insignificant relationship between prime lending rate and gross domestic product. The coefficient of the prime lending rate is -2511.881 which implies that one percent change in PLR by will increase the GDP by 25.11% in negative direction. The null hypothesis which states that prime lending rate has no significant effect on the GDP was accepted.

5. CONCLUSION

The findings of the study shows that gross domestic product in Nigeria is influence buy money supply and prime lending rate as found by Bawa, Akinniyi and Njarendy (2018) on cash reserve ratio on monetary policy. This study concludes that money supply has positive and significant effect on the gross domestic product while prime lending rate has negative and insignificant effect on gross domestic product. The study recommends that CBN should redefine the monetary policy instrument, CBN should also set the lending rate at optimum level as these would assist to boost credit

expansion, loan and advance and invariable returns and profit abilities of DMBs in Nigeria.

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