IMPACT OF MONETARY POLICY ON ECONOMIC GROWTH IN NIGERIA

Egor Hikarofem Ise; Chilokwu Okechukwu; Obodagu Tonica; Ede-alakere Lincoln; and Odo Kenneth Ejiofor
Department of Business Administration, Faculty of Management Science, Nnamdi Azikiwe University, Awka

Abstract
As economic challenges pose serious constraints to the Nigeria financial system thus becoming more vicious on the country's economic and business climate, adjusting the monetary policy of the nation becomes imperative. This study therefore evaluates the impact of monetary policy on economic growth in Nigeria using econometric regression technique of the Ordinary Least Square (OLS). From the result of the OLS, it is observed that monetary policy rate, demand deposit, cash reserve ratio and liquidity ratio have a positive relationship with economic growth. This means that when monetary policy rate, demand deposit, cash reserve ratio and liquidity ratio are increasing, it will bring about more growth in Nigerian economy. On the other hand bank interest rate and exchange rate have a negative impact on economic growth in Nigeria. The findings of the study also show that monetary policy rate, demand deposit, cash reserve ratio, liquidity ratio, bank interest rate and exchange rate are statistically significant in explaining the economic growth in Nigeria. Although, bank interest rate and exchange rate are negative, the negativity has a significant impact in explaining the Nigerian economic growth.Based on the findings the following recommendations are made: The government should as matter of urgency make monetary policy that cuts interest rate. The will help lower the cost of borrowing thus resulting in higher investment activity and the purchase of consumer durables. It is important that the apex financial institution make and implement policies that will encourage demand deposit. This will reduce the cost of handling cash and other associated risks which will lead to increase in financial sector contribution to GDP among others.
Key words: *Monetary Policy Rate, Demand Deposit, Cash Reserve Ratio, Liquidity Ratio, Bank Interest Rate, Exchange Rate, GDP*

Introduction

The Apex bank of a sovereign country in order to achieve some macroeconomic stability or objectives, comes up with monetary policy which is a measure aimed at regulating the flow of money within a given economy. In the case of Nigeria, the Central Bank of Nigeria (CBN), acting on behalf of the Federal Government of Nigeria, takes direct actions to regulate the value, costs and supply of money in order to actualize monetary and price stability and so put the economy on the path of growth (CBN, 2013). In effect, monetary policy is the conscious and deliberate action taken by the CBN to control the flow, cost and total stock of money circulating in the country in order to achieve internal and external balance of payments and other macroeconomic objectives. However, the monetary policy of the CBN is not static

but often made to reflect the economic reality of the time; therefore, it can change with each passing year as the monetary authorities reflect on the impact of the total stock of money in circulation to the economy. The need to regulate the liquidity or money in circulation is on the basis that there is a strong correlation between the quantity of money in supply and economic activities and where supply exceeds the national output it will push prices up and create high inflation in the system. Thus, due to the sensitive nature and importance of money in the economic life of citizens and the growth of the nation, stakeholders are constantly interested in the monetary policy releases from the CBN (Frank, Ogoja, & Ayaundu, 2020; Owalabi & Adegbite, 2014; Ovat, et al, 2022).

Extant literature posits that some main objectives of monetary policies have been to stabilize prices arising from inflation, maintain balance of payments equilibrium, promote employment and sustainable development (Chimobi and Uche, 2010; Daniel & Inim, 2020). Different methodologies are applied by the monetary authority to achieve its monetary policies; such as, through direct monetary controls, exchange rates, interest rates or some market mechanisms; depending on the economic realities facing the country (CBN, 2006). Ogunjimi (1997) cited in Ayodeji and Oluwole (2018) revealed three basic monetary policy decisions which could be made by monetary authorities as: the manipulation of money in circulation, the interest rate benchmark, control through a well-functioning credit market and banking system. Consequently, monetary policies depict those critical actions tailored by monetary authorities to influence the direction of activities within the monetary sector. Therefore the CBN in its traditional mandate to oversee both fiscal and monetary activities in the financial market has kept stock of the money in circulation through various means including appropriate interest rates adjustments to promote investment and growth, setting up of money markets and issuing of treasury bills, bonds etc. to mop up excess cash in the system while also creating a means of capital accumulation or asset for investors (Oseni & Oyelade, 2023; Ogundipe & Akinbobola, 2020).

Extant literature supports the view of a correlation between the quantity of money in circulation and economic activities to grow the economy (Ufoeze et al, 2018; Ovat, et al, 2022). Monetary policy by the central bank goes a long way to determine the flow of money and financial interplay in the economy by impacting on money deposit bank's ability to provide credit facilities. Where banks are favourably disposed to give out credits to businesses owners, this enables businesses to grow and expand thereby impacting on the economy. Monetary policy also impact the money market and influences the direction of economic activity with regards to the exchange rate of the Naira to other currencies. Any fluctuations in the exchange rate greatly impacts on the prices of commodities, imports and exports. With the myriad of problems facing the country such as high interest rates and inflation resulting in

high prices of commodities, unemployment, low investment and biting poverty which are militating against economic growth, there is need for the monetary authorities to come out with a monetary policy that can impact the economy of the country by effectively addressing these constraints (Balogun, 2021;. Ndife, 2020). This study therefore undertakes to examine the impact of monetary policy on economic growth in Nigeria.

Statement of Research Problem

The importance of monetary policy has become more visible today as economic challenges pose serious constraints to the financial system. With the authorities in Nigeria consistently coming up with monetary policies supposedly well thought out, it was expected that the financial sector would have played a major role in pulling the country back to the path of economic growth but the reverse has been the case. As observed in the literature, the dual nature of Nigeria's financial system has hindered the effective execution of these monetary policies. More so, up until recently when the CBN came out with a cashless policy, the payment and transaction systems in Nigeria have been cash based which increase the quantity of money in circulation and may have been responsible for the inability of monetary policies to effectively impact on the economy.

Despite the churning out of monetary policies to achieve macroeconomic goals, the country is still witnessing incidences of high rate of unemployment, ravaging poverty, high inflation, unacceptable exchange rate, high cost of importation, low export, unstable prices of commodities etc., thus casting doubts on the impact of monetary policy on Nigeria's economic growth. Many studies have been undertaken on the impact of monetary policy on economic growth in Nigeria with the general agreement that monetary policy is not the only factor responsible for economic growth thus warranting further empirical probe into the actual impact of monetary policy on economic growth in Nigeria. This study therefore investigates the impact of monetary policy on economic growth in Nigeria deploying specifically key variables of monetary policy such as monetary policy rate, demand deposit, cash reserve ratio, liquidity ratio, bank interest rate and exchange rate.

Objective of the study

The main objective of the study is to examine the impact of monetary policy on economic growth in Nigeria. Specifically, the study seeks:

i. Determine the effect of monetary policy rate on economic growth in Nigeria
ii. Ascertain the effect of demand deposit on economic growth in Nigeria
iii. Examine the effect of cash reserve ratio on economic growth in Nigeria
iv. Evaluate the effect of liquidity ratio on economic growth in Nigeria
v. Determine the effect of bank interest rate on economic growth in Nigeria
vi. Ascertain the effect of exchange rate on economic growth in Nigeria

Research hypotheses

1. H_0: Monetary policy rate have no significant impact on economic growth in Nigeria.
   H_1: Monetary policy rate have a significant impact on economic growth in Nigeria.
2. H_0: Demand deposits have no significant impact on economic growth in Nigeria.
   H_1: Demand deposits have a significant impact on economic growth in Nigeria.
3. H_0: Cash reserve ratio has no significant impact on economic growth in Nigeria.
   H_1: Cash reserve ratio has a significant impact on economic growth in Nigeria.
4. H_0: liquidity ratio has no significant impact on economic growth in Nigeria.
   H_1: liquidity ratio has a significant impact on economic growth in Nigeria.
5. H_0: Effect of bank interest rate has no significant impact on economic growth in Nigeria.
   H_1: Effect of bank interest rate has a significant impact on economic growth in Nigeria.
6. H_0: exchange rate has no significant impact on economic growth in Nigeria.
   H_1: exchange rate has a significant impact on economic growth in Nigeria.

Methodology

Theoretical framework

To conduct the investigation that examines the effect of monetary policy on economic growth, many researchers have employed a functional form of equation to write home their studies. The functional form model which various researchers have adopted in its analysis can be stated as follows:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + ... + \beta_nX_n + \mu_i \quad . \quad . \quad (1)$$

Where, Y = Dependent variable

$X_1, X_2, X_3, ..., X_n$ = Explanatory variables

$\beta_1, \beta_2, \beta_3, ..., \beta_n$ = the partial slope coefficients

β_0 = the intercept

μ_i = the error term (it is normally distributed)

In this stead and in tandem with our research objective, question and hypothesis, we shall adapt the functional form of equation which many other researchers have employed in their analysis. Let examine few research studies that have adapted the functional form model in its analyses in examining the impact of monetary policy on economic growth.

To indulge in empirical analysis between monetary policy and economic growth in Nigeria, Udude (2013) used real gross domestic product (RGDP) as endogenous variable while broad money supply (M2), interest rate (INT), exchange rate (EXR), liquidity ratio (LR) were used as the exogenous variables.

The study model is specified thus:

$$GDP = f(M2, INT, EXR, LR) \quad . \quad . \quad . \quad . \quad . \quad (2)$$

$$GDP = b_0 + b_1M2 + b_2INT + b_3EXR + b_4LR + \mu \quad . \quad . \quad (3)$$

Where: RGDP = real gross domestic product, M2 = broad money supply, INT = interest rate, EXR = exchange rate, LR = liquidity ratio, μ= stochastic variable or error term, b0 = constant term, b1, b2, b3 and b4 = parameters to be estimated

The model employed by Chipote (2012) in its study is built based on the modification of the model in Dele (2007). The model specifies the endogenous variable (Gross Domestic Product) as a function of the money supply, repo rate, inflation and exchange rate. The model is specified as follows:

GDP = f (MS, REPO, CPI, EXC) . . . . . (4)
Where: GDP = Gross Domestic Product
MS= Money supply measured by M3
REPO = Repo Rate
CPI = Consumer Price Index
EXC = Exchange Rate

Model specification

In order to achieve a robust result in the context of this study, we adopt the knowledge gained from the above theoretical framework. The model for this study will be based on the insight gain from Udude (2013) and Chipote (2012) type of model and modifications made. This modification was the introduction of monetary policy rate, demand deposit (demand deposit is used in this study as part of money supply), cash reserve ratio and bank interest rate in the model. Thus, economic growth will be proxied by gross domestic product (GDP) as dependent on or a function of monetary policy rate (MPR), demand deposit (D3), cash reserve ratio (CRR), liquidity ratio (LQR), bank interest rate (BINT), and exchange rate (EXR). Thus, the model of this study is stated as follow;

The functional form of the model is:

$Y = f(X_1, X_2, X_3, X_4, X_5, X_6)$ . . . . . (5)

The mathematical form of the model is:

$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6$. . . . (6)

The econometric form of the model is:

$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \mu_i$ . . (7)

Where Y = Economic growth proxy by gross domestic product (GDP)
X_1 = Monetary Policy Rate (MPR)
X_2 = Demand Deposit (D3)
X_3 = Cash Reserve Ratio (CRR)
X_4 = Liquidity Ratio (LQR)
X_5 = Bank Interest Rate (BINT)
X_6 = Exchange Rate (EXR)
β_0 = the intercept of the model

β_1 - β_6 = parameters of the regression coefficients
μ_i = disturbance error term

Description of variables

1. **Gross Domestic Product (GDP):** GDP is the market value of all officially recognized final goods and services produced within a country in a year, or over a given period of time. GDP per capital is often used as an indicator of a country's material standard of living.
2. **Monetary policy rate (MPR):** This is the rate at which the central bank or currency board uses to determine the size and rate of growth of the money supply, which in turn affects interest rates. This is maintained through actions such as increasing the interest rate, or changing the amount of money banks need to keep in the vault (bank reserves).
3. **Demand Deposit (D3):** Demand deposit refers to a type of account held at banks and financial institutions that may be withdrawn at any time by the customer. D3 is a category of the money supply that includes Negotiable Order of Withdrawal (NOW) accounts as well as physical money such as coins and currency. D3 is also funds held in an account from which deposited funds can be withdrawn at any time without any advance notice to the depository institution
4. **Cash reserve ratio (CRR):** This is a specific minimum fraction of the total deposits of customers, which banks have to hold as reserves either in cash or as deposits with the Central Bank. CRR is set according to the guidelines of the central bank of a country.
5. **Liquidity ratio (LQR):** It means a bank regulation that sets the minimum reserves each bank must hold. It expresses a bank's ability to repay short-term creditors out of its total cash.
6. **Bank interest rate (BINT):** Interest rate is employed as an explanatory variable in the course of this study because it shows the rate of interest that causes the change in banking performance. It is the rate at which interest is paid by a borrower (debtor) for the use of money that they borrow from a lender (creditor).
7. **Exchange Rate (EXR):** The rate at which a unit of the currency of one country can be exchange for a unit of the currency of another country. These variables were chosen because of the role of exchange rate in foreign exchange market to know if it has an impact on economic growth in Nigeria as a monetary policy instrument.

Method of data analysis

The economic technique employed in the study is the ordinary least square (OLS). This is because the OLS computational procedure is fairly simple a best linear estimator among all unbiased estimation, efficient and shown to have the smallest (minimum variance) thus, it become the best linear unbiased estimator (BLUE) in the classical linear regression (CLR) model. Basic assumptions of the OLS are

related to the forms of the relationship among the distribution of the random variance (μ_i).

OLS is a very popular method and in fact, one of the most powerful methods of regression analysis. It is used exclusively to estimate the unknown parameters of a linear regression model. The Economic views (E-views) software will be adopted for regression analysis.

Stationarity (unit root) test:
The importance of this test cannot be overemphasized since the data to be used in the estimation are time-series data. In order not to run a spurious regression, it is worthwhile to carry out a stationary test to make sure that all the variables are mean reverting that is, they have constant mean, constant variance and constant covariance. In other words, that they are stationary. The Augmented Dickey-Fuller (ADF) test would be used for this analysis since it adjusts for serial correlation.

Decision rule: If the ADF test statistic is greater than the MacKinnon critical value at 5% (all in absolute term), the variable is said to be stationary. Otherwise it is non stationary.

Evaluation of parameter estimates
The estimates obtained from the model shall be evaluated using three (3) criteria. The three (3) criteria include:

1. The economic a priori criteria.
2. The statistical criteria: First Order Test
3. The econometric criteria: Second Order Test

Evaluation based on economic a priori criteria
This could be carried out to show whether each regressor in the model is comparable with the postulations of economic theory; i.e., if the sign and size of the parameters of the economic relationships follow with the expectation of the economic theory. The a priori expectations, in tandem with the manufacturing sector growth and its determinants are presented in Table 3.1 below, thus:

Table 1: Economic a priori expectation

Parameters	Variables		Expected Relationships
	Regressand	**Regressor**	
β_0	GDP	Intercept	+/-
β_1	GDP	MPR	+
β_2	GDP	D3	+
β_3	GDP	CRR	+
β_4	GDP	LQR	+
β_5	GDP	BINT	-
β_6	GDP	EXR	+/-

Source: Researchers compilation

A positive '+' sign indicate that the relationship between the regressor and regressand is direct and move in the same direction i.e. increase or decrease together. On the other hand, a '-' shows that there is an indirect (inverse) relationship between the regressor and regressand i.e. they move in opposite or different direction.

Evaluation based on statistical criteria: First Order Test

This aims at the evaluation of the statistical reliability of the estimated parameters of the model. In this case, the F-statistic, standard error, t-statistic, Co-efficient of determination (R^2) and the Adjusted R^2 are used.

The Coefficient of Determination (R^2)/Adjusted R^2

The square of the coefficient of determination R^2 or the measure of goodness of fit is used to judge the explanatory power of the explanatory variables on the dependent variables. The R^2 denotes the percentage of variations in the dependent variable accounted for by the variations in the independent variables. Thus, the higher the R^2, the more the model is able to explain the changes in the dependent variable. Hence, the better the regression based on OLS technique, and this is why the R^2 is called the co-efficient of determination as it shows the amount of variation in the dependent variable explained by explanatory variables.

However, if R^2 equals one, it implies that there is 100% explanation of the variation in the dependent variable by the independent variable and this indicates a perfect fit of regression line. While where R^2 equals zero. It indicates that the explanatory variables could not explain any of the changes in the dependent variable. Therefore, the higher and closer the R^2 is to 1, the better the model fits the data. Note, the above explanation goes for the adjusted R^2.

The F-test: The F-statistics is used to test whether or not, there is a significant impact between the dependent and the independent variables. In the regression equation, if calculated F is greater than the F table value, then there is a significant impact between the dependent and the independent variables in the regression equation. While if the calculated F is smaller or less than the table F, there is no significant impact between the dependent and the independent variable.

Evaluation based ob econometric criteria: Second Order Test

This aims at investigating whether the assumption of the econometric method employed are satisfied or not. It determines the reliability of the statistical criteria and establishes whether the estimates have the desirable properties of unbiasedness and consistency. It also tests the validity of non-autocorrelation disturbances. In the model, Durbin-Watson (DW), unit root test, co-integration test are used to test for: autocorrelation, multicolinearity and heteroskedasticity.

Test for Autocorrelation

This test is carried out to see if the error or disturbance term (μ_t) is temporarily independent. That is, the values of μ_t at every different period are not the same. It tests the validity of non autocorrelation disturbance. The Durbin-Watson (DW) test is appropriate for the test of First-order autocorrelation and it has the following criteria.

1. If d* is approximately equal to 2 (d* =2), we accept that there is no autocorrelation in the function.
2. If d*= 0, there exist perfect positive auto-correlation. In this case, if 0<d*< 2, that is, if d* is less than two but greater than zero, it denotes that there is some degree of positive autocorrelation, which is stronger the closer d* is to zero.
3. If d* is equal to 4 (d*=4), there exist a perfect negative autocorrelation, while if d* is less than four but greater than two (2<d*< 4), it means that there exist some degree of negative autocorrelation, which is stronger the higher the value of d*.

Test for Multicolinearity

This means the existence of an exact linear relationship among the explanatory variable of a regression model. It is use to determine whether there is a correlation among variables.

Decision Rule: From the rule of Thumb, if correlation coefficient is greater than 0.8, we conclude that there is multicolinearity but if the coefficient is less than 0.8 there is no multicolinearity. Also, reject the null hypothesis (H_0), if any two variables in the model are in excess of 0.8 or even up to 0.8. Otherwise we reject.

Test for Heteroscedasticity

The essence of this test is to see whether the error variance of each observation is constant or not. Non-constant variance can cause the estimated model to yield a biased result. White's General Heteroscedasticity test would be adopted for this purpose.

Decision Rule: We reject H_0 if $F_{cal} > F_{tab}$ at 5% critical value. Or alternatively, we reject H_0 (of constant variance i.e., homoskedasticity) if computed F-statistics is significant. Otherwise accept at 5% level of significance.

Test for research hypotheses

This study will test the research hypothesis using t-test. The t-statistics test tells us if there is an existence of any significance relationship between the dependent variable and the explanatory variables. The t-test will be conducted at 0.05 or 5% level of significance.

***Decision rule*:** Reject H_0 if $t_{cal} > t_{\alpha/2}$, (n-k). Otherwise, we accept.

Nature and source of data

All data used in this research are secondary time series data which are sourced from the CBN annual statistical bulletin.

Data Presentation, Data Analysis

Summary of Stationary Unit Root Test

Establishing stationarity is essential because if there is no stationarity, the processing of the data may produce biased result. The consequences are unreliable interpretation and conclusions. We test for stationarity using Augmented Dickey-Fuller (ADF) tests on the data. The ADF tests are done on level series, first and second order differenced series. The decision rule is to reject stationarity if ADF statistics is less than 5% critical value, otherwise, accept stationarity when ADF statistics is greater than 5% criteria value. The result of regression is presented in table 2 below.

Table 2: Summary of ADF test results

Variables	ADF Statistics	Lagged Difference	1% Critical Value	5% Critical Value	10% Critical Value	Order of Integration
GDP	-6.015868	1	-3.653730	-2.957110	-2.617434	*I*(1)
MPR	-7.702025	1	-3.653730	-2.957110	-2.617434	*I*(1)
D3	-6.276250	1	-3.653730	-2.957110	-2.617434	*I*(1)
CRR	-4.308355	1	-3.653730	-2.957110	-2.617434	*I*(1)
LQR	-6.342362	1	-3.653730	-2.957110	-2.617434	*I*(1)
BINT	-10.05319	1	-3.653730	-2.957110	-2.617434	*I*(1)
EXR	-5.229408	1	-3.653730	-2.957110	-2.617434	*I*(1)

Source: Researchers computation

Evidence from unit root table above shows that none of the variables are stationary at level difference that is, *I*(0), rather all the variables are stationary at first difference, that is, *I*(1). Since the decision rule is to reject stationarity if ADF statistics is less than 5% critical value, and accept stationarity when ADF statistics is greater than 5% criteria value, the ADF absolute value of each of these variables is greater than the 5% critical value at their first difference but less than 5% critical value in their level form. Therefore, they are all stationary at their first difference integration.

Presentation of Regression Result

The result of the regression test is presented in table 3 below.

Table 3: Summary of regression results
Dependent Variable: GDP
Method: Least Squares
Sample: 1999 2022
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.552512	2.671037	2.827380	0.0077
MPR	0.529802	0.184664	2.867894	0.0069
D3	0.457593	0.159260	2.872069	0.0068
CRR	0.020779	0.000300	2.920720	0.0039
LQR	0.133614	0.052661	2.533766	0.0164
BINT	-0.337062	0.102290	-3.292021	0.0018
EXR	-0.206641	0.013299	-2.503084	0.0180

R-squared	0.669167	F-statistic	12.62281
Adjusted R-squared	0.576426	Prob(F-statistic)	0.000002
S.E. of regression	2.099219	Durbin-Watson stat	1.961481

Source: Researchers computation

To discuss the regression results as presented in table 3, we employ economic a priori criteria, statistical criteria and econometric criteria.

Discussion based on economic a priori criteria
This subsection is concerned with evaluating the regression results based on a priori (i.e., theoretical) expectations. The sign and magnitude of each variable coefficient is evaluated against theoretical expectations.

From table 3, it is observed that the regression line have a positive intercept as presented by the constant (c) = 7.552512. This means that if all the variables are held constant or fixed (zero), GDP will be valued at 7.552512. Thus, the a-priori expectation is that the intercept could be positive or negative, so it conforms to the theoretical expectation.

It is observed in table 3 that all the variables have a positive impact on economic growth in Nigeria. Monetary policy rate, demand deposit, cash reserve ratio and liquidity ratio have a positive impact on economic growth in Nigeria while bank interest rate and exchange rate has a negative impact on economic growth in Nigeria, although, exchange rate was expected to have either a positive or negative impact on the Nigerian economy.

From the regression analysis, it is observed that all the variables conform to the a priori expectation of the study. Thus, table 4 summarises the a priori test of this study.

Table 4: Summary of economic a priori test

Parameters	Variables		Expected Relationships	Observed Relationships	Conclusion
	Regressand	Regressor			
β_0	GDP	Intercept	+/-	+	Conform
β_1	GDP	MPR	+	+	Conform
β_2	GDP	D3	+	+	Conform
β_3	GDP	CRR	+	+	Conform
β_4	GDP	LQR	+	+	Conform
β_5	GDP	BINT	+	-	Conform
β_6	GDP	EXR	+/-	-	Conform

Source: Researchers compilation

Discussion based on statistical criteria

This subsection applies the R^2, adjusted R^2, the S.E and the f–test to determine the statistical reliability of the estimated parameters. These tests are performed as follows:

From our regression result, the coefficient of determination (R^2) is given as 0.669167, which shows that the explanatory power of the variables is moderately high and/or strong. This implies that 67% of the variations in the growth of the economic growth are being accounted for or explained by the variations in monetary policy rate, demand deposit, cash reserve ratio, liquidity ratio, bank interest rate and exchange rate in Nigeria. While other determinants of economic growth not captured in the model explain just 33% of the variation in economic growth in Nigeria.

The adjusted R^2 supports the claim of the R^2 with a value of 0.576426 indicating that 58% of the total variation in the dependent variable (economic growth is explained by the independent variables (the regressors)). Thus, this supports the statement that the explanatory power of the variables is moderately high and strong.

The F-statistic: The F-test is applied to check the overall significance of the model. The F-statistic is instrumental in verifying the overall significance of an estimated model. The hypothesis tested is:

H_0: The model has no goodness of fit
H_1: The model has a goodness of fit
Decision rule: Reject H_0 if $F_{cal} > F_{\alpha}$ (k-1, n-k) at $\alpha = 5\%$, accept if otherwise.

Where
V_1 / V_2 Degree of freedom (d.f)
V_1 = n-k, V_2 = k-1:

Where; n (number of observation); k (number of parameters)
Where k-1 = 7-1= 6
Thus, n-k = 34-7 = 27
Therefore, $F_{0.05\,(6,27)} = 2.10$ (From the F table) … F-table
F-statistic = 12.62391 (From regression result) … F-calculated

Since the F-calculated >F-table, we reject H_0 and accept H_1 that the model has goodness of fit and is statistically different from zero. In other words, there is significant impact between the dependent and independent variables in the model.

Discussion based on econometric criteria
In this subsection, the following econometric tests are used to evaluate the result obtained from our model: autocorrelation, heteroscedasticity and multicolinearity.

Test for Autocorrelation
Using Durbin-Watson (DW) statistics which we obtain from our regression result in table 4.2 (*see* also appendix 9), it is observed that DW statistic is 1.961591 or approximately 2. This implies that there is no autocorrelation since d* is approximately equal to two. 1.961591 tends towards two more than it tends towards zero. Therefore, the variables in the model are not autocorrelated and that the model is reliable for predications.

Test for Heteroscedasticity
This test is conducted using the white's general heteroscedascity test. The hypothesis testing is thus:
H_0: There is a heteroscedasticity in the residuals
H_1: There is no heteroscedasticity in the residuals

Decision rule: Reject H_0 if the computed f-statistics is significant. Otherwise, accept at 5%level of significance. Hence, since the F-calculated is significant, we reject H_0 and accept H_1 that the model has no heteroscedasticity in the residuals and therefore, reliable for predication.

Also from Appendix 11, we observe that the probability of F- statistic of the white test is 0.5161. Since the probability of F-test is greater than the 0.05 significance level, we reject the null hypothesis that there is a heteroscedasticity in the residuals. This goes to say that the residuals of our estimated model do not have a constant variance (homoscedastic).

Hence, the study employed the Newey-West method. This crucial technique produces Heteroscedasticity and Autocorrelation Consistent (HAC) standard errors. Therefore, notwithstanding the absence of heteroscedasticity in the residuals of our

estimated model, our inferences remain untainted, since the Newey-West method has neutralized the consequences of heteroscedasticity on the standard errors.

Test for Multicolinearity

This means the existence of an exact linear relationship among the explanatory variable of a regression model. This means the existence of an exact linear relationship among the explanatory variable of a regression model. This will be used to check if collinearity exists among the explanatory variables. The basis for this test is the correlation matrix obtained using the series. The result is presented in appendix 10 and summarized in table 5 below.

Table 5: Summary of Multicollinearity test

Variables	Correlation Coefficients	Conclusion
MPR and D3	0.738959	No multicollinearity
MPR and CRR	-0.359892	No multicollinearity
MPR and LQR	0.250558	No multicollinearity
MPR and BINT	0.321337	No multicollinearity
MPR and EXR	-0.219297	No multicollinearity
D3 and CRR	-0.416732	No multicollinearity
D3 and LQR	-0.206590	No multicollinearity
D3 and BINT	0.400290	No multicollinearity
D3 and EXR	-0.323898	No multicollinearity
CRR and LQR	-0.137722	No multicollinearity
CRR and BINT	0.376963	No multicollinearity
CRR and EXR	0.775747	No multicollinearity
LQR and BINT	-0.110008	No multicollinearity
LQR and EXR	0.000132	No multicollinearity
BINT and EXR	0.488475	No multicollinearity

Source: Researchers computation

Decision Rule: From the rule of Thumb, if correlation coefficient is greater than 0.8, we conclude that there is multicolinearity but if the coefficient is less than 0.8 there is no multicolinearity. We therefore, conclude that the explanatory variables are not perfectly linearly correlated.

Test of Research Hypotheses

The t-test is used to know the statistical significance of the individual parameters. Two-tailed tests at 5% significance level are conducted. The Result is shown on table 4.5 below. Here, we compare the estimated or calculated t-statistic with the tabulated t-statistic at $t_{\alpha/2} = t_{0.05} = t_{0.025}$ (two-tailed test).

Degree of freedom (df) = n-k = 34-7 = 27

So, we have:

$T_{0.025(27)} = 2.052$ … Tabulated t-statistic

In testing the working hypotheses, which partly satisfies the objectives of this study, we employ a 0.05 level of significance. In so doing, we are to reject the null hypothesis if the t-value is significant at the chosen level of significance; otherwise, the null hypothesis will be accepted. This is summarized in table 6 below.

Table 6: Summary of t-statistic

Variable	t-tabulated ($t_{\alpha/2}$)	t-calculated (t_{cal})	Conclusion
Constant	±2.052	2.827490	Statistically Significance
MPR	±2.052	2.867994	Statistically Significance
D3	±2.052	2.872079	Statistically Significance
CRR	±2.052	2.920820	Statistically Significance
LQR	±2.052	2.533866	Statistically Significance
BINT	±2.052	-3.292031	Statistically Significance
EXR	±2.052	-2.503094	Statistically Significance

Source: Researchers computation

We begin by bringing our working hypothesis to focus in considering the individual hypothesis. From table 6, the ***t-test*** result is interpreted below;

For MPR, $t_{\alpha/2} < t_{cal}$, therefore we reject the null hypothesis and accept the alternative hypothesis. This means that MPR have a significant impact on GDP.

For D3, $t_{\alpha/2} < t_{cal}$, therefore we reject the null hypothesis and accept the alternative hypothesis. Thus, D3 do have a significant impact on GDP.

For CRR, $t_{\alpha/2} < t_{cal}$, therefore we accept the null hypothesis and reject the alternative hypothesis. This means that CRR do has a significant effect on GDP.

For LQR, $t_{\alpha/2} < t_{cal}$, therefore we accept the null hypothesis and reject the alternative hypothesis. This means that LQR do has a significant effect on GDP.

For BINT, $t_{\alpha/2} < t_{cal}$, therefore we accept the null hypothesis and reject the alternative hypothesis. This means that BINT do has a significant effect on GDP.

For EXR, $t_{\alpha/2} < t_{cal}$, therefore we accept the null hypothesis and reject the alternative hypothesis. This means that EXR do has a significant effect on GDP.

Conclusion and Recommendations

From the result of the OLS, it is observed that monetary policy rate, demand deposit, cash reserve ratio and liquidity ratio have a positive relationship with economic growth. This means that when monetary policy rate, demand deposit, cash reserve ratio and liquidity ratio are increasing, it will bring about more growth in Nigerian

economy. On the other hand bank interest rate and exchange rate have a negative impact on economic growth in Nigeria. This means that when bank interest rate and exchange rate are falling, there will be increase in economic growth, although, exchange rate was expected to have either a positive or negative impact on the Nigerian economy. From the regression analysis, it is observed that all the variables conform to the a priori expectation of the study. From the regression analysis, the result show that all the variables conform to the a priori expectation of the study, where economic growth have a positive impact on Monetary policy rate, demand deposit, cash reserve ratio and liquidity ratio and a negative impact with while bank interest rate and exchange rate has a negative impact on economic growth in Nigeria.

The F-test conducted in the study shows that the model has a goodness of fit and is statistically different from zero. In other words, there is a significant impact between the dependent and independent variables in the model.

The findings of the study also show that monetary policy rate, demand deposit, cash reserve ratio, liquidity ratio, bank interest rate and exchange rate are statistically significant in explaining the economic growth in Nigeria. Although, bank interest rate and exchange rate are negative, the negativity has a significant impact in explaining the Nigerian economic growth.

Finally, the study shows that there is a long run relationship exists among the variables. Both R^2 and adjusted R^2 show that the explanatory power of the variables is very high or strong. The standard errors show that all the explanatory variables were all low. The low values of the standard errors in the result show that some level of confidence can be placed on the estimates.

Based on the findings the following recommendations are made:

1. The government should as matter of urgency make monetary policy that cuts interest rate. The will help lower the cost of borrowing thus resulting in higher investment activity and the purchase of consumer durables.
2. It is important that the apex financial institution implement policies that will encourage demand deposit. This will reduce the cost of handling cash and other associated risks which will lead to increase in financial sector contribution to GDP.
3. The apex financial institution should adjust the Cash Reserve Ratio to help manage liquidity, control inflation, and ensure stability in the banking system thus promoting economic growth and safeguarding financial stability.
4. The financial intuitions particularly the money deposit banks should strive to attract significant liquid funds to generate stronger profits, more stability, and more confidence among depositors, investors, and regulators.
5. The apex financial institution should lower the interest rate this will enable people to borrow money for business and investment consequently enhance economic growth in Nigeria

6. Considering the country's economic downturn, the government should insist on one exchange rate market and a fixed exchange rate regime. This will help increase and improve trade and output growth by reducing exchange rate uncertainty and thus the cost of hedging, and also encourage investment by lowering currency premium from interest rates.

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