

Money Supply, Liquidity Ratio and Economic Growth: The Nigeria Experience

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Abstract

The aim of every economic policy is to ensure socioeconomic stability. This study aimed at ascertaining the impact of money supply, liquidity ratio on economic growth using data from Nigeria. Ordinary Least Square estimation technique was adopted after confirmation from pre-estimation test. The results showed that Narrow Money, Broad Money and Liquidity Ratio are not statistically significant to influence growth especially in Nigerian economy. This study however suggests that there ought to be consistent efforts from the demand and supply side plus political approach to ensure policy stability.

Keywords: *Narrow Money; Broad Money; Liquidity Ratio; Monetary Policy; Inflation*

1. INTRODUCTION

The mix of measures intended to regulate the worth, supply and cost of money in an economy in consonance with economic activities is commonly referred to as monetary policy. It entails, as described by Central Bank of Nigeria (CBN, 2017), attaining a desirable economy. Monetary authorities, as observed by Anowor and Okorie (2016), are saddled with the primary responsibility to formulate and implement policies that gear toward driving the economy on an even keel. The reoccurring lackluster performance of the Nigerian economy throughout the years which is visible in high rate of inflation, high

rate of unemployment, low capacity utilization, distress in financial sector, fiscal deficits, as the art of controlling the bearing and movement of monetary and credit facilities in pursuance of interest rate and exchange rate instability among others are major indicators the monetary policy should resolve (Onodugo, Anowor & Ofoegbu, 2018). In a simplified term, monetary policy implies the determination of the optimal quantity of money as well as optimal growth rate of money stock in an economy.

An imperative issue to policy makers is the uncommon role, as noted by Ifionu and Akinpelumi (2015), of money in the economy because of its tremendous significance as an adjustment in its sum can significantly affect the major macroeconomic indicators. Through the control of monetary policy targets, for example, interest rate, the quantity of money and reserved cash among others; monetary authorities directly and indirectly control the demand for and supply of money, and thus influence the availability of money (see: Tobias & Manbo, 2012). Various hypotheses, as advanced by Anowor and Okorie (2016), have been formulated on the relationship between money and the economy. Morgan (1981) distinguished two causal connections between private investment and monetary policy. McKinnon (1973) took side with the supply front argument by proposing a complementary relationship between accumulations of financial asset (money balances) and physical accumulation in developing countries. Similarly Onouorah, Shaib and Ehikioya (2012) in relating the supply leading argument based on inside money model further stated that high interest rates are fundamental in pulling in additionally saving.

Money supply is characterized in Nigeria as narrow money (M1) and broad money (M2). Narrow money (M1) are in circulation with non-public and current accounts or demand deposit in the bank. Narrow money and savings, time deposit and foreign currency deposits are broad money (M2). It measures total volume of money supply in an economy. When the amount of broad money is over and above total output in the economy, excess liquidity may arise in the economy. The need to control money supply, as pointed by Fasanya, Onakoya and Agboluaje (2013), depends on the information that there is a steady connection between the quantity of money supplied and economic activity and that if its supply is not limited to what is required to support productive activities; hence it will result in undesirable effects such as inflation.

The classical school of thought proposes that variations in money supply or other aggregates will work through some intermediate variables through which some effects are transmitted to ultimate macroeconomic objectives (Lucky & Uzah, 2017). Monetary policy transmission mechanism refers to the various intermediate channels through which changes in nominal money stock or short-term interest rates affect the macroeconomic aggregate. In Nigeria, Central Bank of Nigeria Act 1969 empowered CBN the monetary policy function under the supervision of Ministry of Finance. Another variable that money supply affects is the liquidity ratios. Liquidity ratio conveys firm's capacity to reimburse short term creditor out of its total cash. It is the consequence of separating the total cash by short term borrowings. It shows the number of times short term liabilities are covered.

Despite various monetary policy and fiscal policy regimes adopted in Nigeria since independence, the Nigerian economy in comparison with countries in Europe and America still face the challenges of weak economic activities as reflected in weakening financial indicators, inflation still remain a threat to Nigeria' economic prosperity, same with unemployment, inequality, poverty and socio-economic stability (see: Anowor & Nwanji, 2018; Onodugo, Obi, Anowor, Nwonye & Ofoegbu, 2017; Fasanya, Onakoya and Agboluaje, 2013; Tobias & Mambo, 2012). More so, Okorie and Anowor (2017) discerned that the sum of those in poverty trap in Nigeria has continued to increase same as unemployment rates. Different avowal have been modulating the position of money in an economy and have relegated the position of money to that of a means to economic growth/development without seeing it intrinsically as an end in itself which could respond to unpredictability in economic factors, while some concurred that changes in the quantity of money is the most significant determinant of economic factors, for example, inflation and economic growth, and that economies that commit more time to studying the conduct of aggregate money

supply rarely experience a lot of changes in their economic activities (Harding and Pagan, 2001). In addition, some others are skeptical about the influence of money on aggregate income.

In light of the observations above, it is therefore pertinent to highlight money supply and liquidity reserve and establish to which extent each has actually impacted economic growth in Nigeria. The study specifically aims to ascertain: (1) whether Narrow money (M_1) has significant effect on the Real Gross Domestic Product in Nigeria; (2) whether Broad money (M_2) has significant effect on the Real Gross Domestic Product in Nigeria; and (3) Liquidity ratio has significant effect on the Real Gross Domestic Product in Nigeria.

2. LITERATURE REVIEW

A study by Farooq (2017), using convenience sampling method of data collection for a ten-year period (2005 – 2014) on the factors of bank liquidity with empirical evidence from commercial banks in Pakistan found a positive and significant effect of CAP on bank liquidity. The study thus recommends that since banks' profits are advances and illiquid assets the banks should advance loans to prime borrowers particularly at a situation where risk is likely to reduce such that liquidity level may not contract. Based on this, commercial banks can reduce nonperforming loans and maintain efficient liquidity level. In a study by Akume and Nkwetta (2017) with time series data (1990 – 2016) on modelling the impact of liquidity trend on financial performance commercial banks and economic growth in Cameroon, the study found that there exists a negative link between excess liquidity and banks performance within the period. It therefore recommends that efforts should be geared towards regulatory control of minimum and maximum liquidity and encouraging moral suasion and support for agricultural, industrial and educational activities in Cameroon.

Kipkirui (2014) conducted a study assessing the impact of money supply on GDP of Kenya to confirm the empirical relationship between money supply and economic growth. The study carried out a causal research design employing Engel-Granger cointegration and Granger causality tests under the error correction framework with time series data ranging from 1970 to 2012. The result however revealed that there is a long-run relationship existing between money supply and economic growth proxied by GDP. This implies that money supply has been increasing significantly in Kenya over the reviewed period. The study therefore concluded that money supply has harmful effects on the economy within this same period. It however recommended that government should not interfere in projects the private sector can handle like transportation, refining petroleum products, etc. rather should ensure conducive environment and supports to the private sector like improved infrastructure, subsidies, tax holidays and guarantees.

Siyasanga and Hlalefang (2017) employed Auto Regressive Distributed Lag ARDL bound testing approach using data from 1980 to 2016 and carried out a study on the dynamic influence of money supply on economic growth of South Africa. Four variables were specified namely: gross domestic product per capita, broad money supply, interest rate and inflation rate. The study found that money supply has positive and significant impact on economic growth both in the short run and long run. It therefore recommends that South African government maintain consistency following the Taylor Rule to enable money supply increase at a steady rate in order to keep pace with economic growth as it will help the Reserve Bank avoid inefficiencies that could emanate from execution of discretionary policy.

Evaluating the effect of liquidity growth on saving rate in developing countries Mohammad, Marzieh and Kobra (2014) employed panel data analysis to studied the eleven countries namely: Armenia, Azerbaijan, Brazil, China, Colombia, Ecuador, Iran, Thailand, Tunisia, Turkey and Venezuela using data from 2001 to 2010. The study showed that economic growth plays immense role on savings as the results of

estimations revealed that despite the fact that both liquidity ration and economic growth have significant and positive effect on savings, but economic growth is more effective which is thus fully reasonable.

Enock and Nicholas (2018) adopted ex -post facto approach to carry out a review of impact of monetary policy on economic growth in developing countries. The primary aim of the study was to evaluate the relationship between monetary policy and economic growth. The result of the study showed that relationship between monetary policy and economic growth is largely brought about by among other things the size and competition within the financial sector, the monetary and exchange regimes, and degree of openness. They hence conclude that monetary policy is relevant to ensure growth both in the short run and long run despite the preponderant ambiguous relationship. The study therefore recommended that there are needs for intensive financial measures for developing countries as well as suitable structural reforms to address supply side deficiencies.

Anowor and Okorie (2016) in their work on a reassessment of the impact of monetary policy on economic growth in Nigeria adopting the Error Correction Model approach with the use of data spanning between 1982 and 2013. The independent variables are Interest Rate, Cash Reserve Ratio and Monetary Policy Rate. However, the result showed that Cash Reserve Ratio is the only significant variable such that any a unit increase in Cash Reserve Ratio will raise the economic growth in Nigeria to extra seven units. Canetti and Greene (2000) in a sample of ten African countries used the Vector Autoregression to sort of the impact of money growth from exchange rate variations on prevailing and predicted rates of inflation. Their finding indicated that monetary dynamic dominates inflation level in four countries while exchange rate depreciations are dominant in three countries. In a study by Yahya (2000), it concluded that despite the distorting effects of a civil war followed by petroleum market boom and burst, Nigerian inflationary experience could ultimately be traced to excessive growth. The study adopting macroeconomic accounting framework, established that any adjustment policy that does not take into account of the role of money and credit is likely to fall short of the overall goal of non-inflationary economic growth,

METHODOLOGY

This study used annual data from 1986 to 2018 sourced from Central Bank of Nigeria. Based on the conceptual framework and related literature, this study leaned on the argument within the endogenous growth literature. Caporale, Spagnolo and Spagnolo (2014) argued that, a number of theoretical studies have focused on the links between endogenous growth and financial markets. However, Bencivenga and Smith (1991) and Levine (2005) are among the first to propose endogenous growth models to identify the channels through which monetary instruments affect long-run economic growth.

The generalized model is thus specified below:

$$Y_t = \alpha_i + \beta \sum X_t + \varepsilon_t \dots\dots\dots(1)$$

Y = Gross Domestic Product which serves as proxy for dependent variable. t = (1, 2, ...n) time-series dimensions. $\sum X$ = Summation of independent variables. α_i = Intercept of the equation.

β = Slope of the function. ε = Stochastic term

From (1) above, growth in GDP (Y) implies change (Δ) in GDP.

Therefore

$$\Delta Y_t = \alpha_i + \beta_{\Delta\Sigma} X_t + \varepsilon_t \dots\dots\dots(2)$$

Our proposed models are of the following forms:

Model I

$$GDP_t = \alpha_0 + \alpha_1 M_{1t} + \alpha_2 INT_t + \alpha_3 INFR_t + \mu_t \dots\dots\dots(3)$$

Where:

GDP = Gross Domestic Product; M₁ = Narrow money; INT = Interest Rate; INFR = Inflation Rate

Model II

$$GDP_t = \beta_0 + \beta_1 M_{2t} + \beta_2 INT_t + \beta_3 INFR_t + \nu_t \dots\dots\dots(4)$$

Where:

GDP = Gross Domestic Product; M₂ = Broad money supply; INT = Interest Rate; INFR = Inflation Rate

Model III

$$GDP_t = \lambda_0 + \lambda_1 LR_{2t} + \lambda_2 INT_t + \lambda_3 INFR_t + \omega_t \dots\dots\dots(5)$$

GDP = Gross Domestic Product; LR = Liquidity Ratio; INT = Interest Rate; INFR = Inflation Rate

3. ANALYSIS OF DATA

Unit Root Test

Table 1: results of the Stationarity test

Variables	ADF - statistic	Critical values 5%	Order of Integration	Prob.
GDP	-7.479605	-2.963972	I(1)	0.0000
M ₁	-4.122753	-2.991878	I(1)	0.0041
M ₂	-7.395915	-2.963972	I(1)	0.0000
LR	-6.173814	-2.963972	I(1)	0.0000
INT	-4.810496	-2.976263	I(1)	0.0007
INFR	-4.510927	-2.976263	I(1)	0.0032

Source: Authors' Computation using Eviews, 9.0.

The result above shows that all the variables were stationary at 5% after first difference. Given this situation, we proceed to test for normality using Jaque-Bera Test statistics.

Table 2: Normality Test

GDP	M1	M2	LR	INT	INFR
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Mean	4.938438	24.22094	24.2615 6	45.70000	65.60938	20.53781
Median	5.400000	22.46500	21.9350 0	45.50000	80.49500	12.95000
Maximum	14.60000	62.24000	57.7800 0	64.10000	158.0700	76.80000
Minimum	-1.580000	-11.10000	1.32000 0	29.10000	0.740000	0.200000
Std. Dev.	3.842462	18.92420	15.9987 0	8.905707	45.66407	19.15725
Skewness	0.401789	0.225372	0.45158 0	0.115670	0.127128	1.619613
Kurtosis	2.684531	2.375593	2.22225 3	2.693652	1.755241	4.421970
Jarque-Bera	0.993678	0.790738	1.89411 6	0.196489	2.152096	16.68611
Probability	0.608451	0.673431	0.38788 0	0.906427	0.340940	0.200038
Sum	158.0300	775.0700	776.370 0	1462.400	2099.500	657.2100
Sum Sq. Dev.	457.7000	11101.88	7934.71 0	2458.660	64641.42	11377.01

Observations **32** **32** **32** **32** **32** **32**

Source: Authors' Computation using Eviews, 9.0.

From the result obtained from Jarque-Bera (JB) test of normality, all the probability of Jarque-Bera statistic is greater than 5% i.e 0.608451 (GDP), 0.673431 (M1), 0.387880 (M2), 0.906427 (LR), 0.340940 (INT) and 0.200038 (INFR) are greater than 0.05 (5% error margin).

Tests for Auto-Correlation

Model I: Since our D-W statistics from the above is 2.936, we conclude that there is no autocorrelation.

Model II: Since our D-W statistics from the above is 2.347, we conclude that there is no autocorrelation.

Model II: Since our D-W statistics from the above is 2.621, we conclude that there is no autocorrelation.

Tests for Heteroskedasticity

Model I: Since our estimated $\chi^2 = 9.201 > \chi^2_{0.05} = 2.46$, we reject H_0 of heteroskedasticity and conclude that the residuals are homoskedasticity.

Model II: Since our estimated $\chi^2 = 11.413 > \chi^2_{0.05} = 4.32$, we reject H_0 of heteroskedasticity and conclude that the residuals are homoskedasticity.

Model III: Since our estimated $\chi^2 = 10.754 > \chi^2_{0.05} = 3.87$, we reject H_0 of heteroskedasticity and conclude that the residuals are homoskedasticity.

Tests for Multicollinearity

From the tests, the partial $R^2 < R^2$ in the respective model; thus we conclude that there is no presence of multicollinearity in each of the model.

Test for Adequacy of the Model

This test was conducted to test whether the models (I II and III) were well specified. For the test, the RESET-TEST was adopted. The tests follow t-distribution at a level of significance of 0.05. Since F in model I (4.125), F in model II (5.623) and F in model III (5.241) are respectively greater than the table value of F (3.42), we accept the null hypothesis and conclude that the models are well specified.

Table 3: Modelling economic growth in Model I by OLS: regressing the effect of Narrow Money (M1), Interest Rate (INT) and Inflation Rate (INFR) on Gross Domestic Product in Nigeria.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.273023	2.208528	1.934783	0.0632
M1	0.030511	0.040148	0.759952	0.4536
INT	0.014167	0.018816	0.752936	0.4578
INFR	-0.048842	0.046253	-1.055963	0.3000

Adjusted R-squared = 0.111010; F-statistic = 1.165467; Prob(F-statistic) = 0.340454

Source: Authors' Computation using Eviews, 9.0.

From table 3 above, the value of the intercept which is 4.273023 shows that Gross Domestic Product will retain 4.273023 units increase when all other variables are held constant.

The estimated coefficient 0.030511(M₁) shows that a percent increase in Narrow Money will cause a 3% increase in Gross Domestic Product in Nigeria. From the above table the coefficient of multiple determination also called R² has a value of 0.111010 which is also 11% of change in dependent variables by independent variables. This shows that the model has low goodness of fit. This also shows that Narrow Money has low outcome on Gross Domestic Product in Nigeria and that Narrow Money had contributed significantly on Gross Domestic Product in Nigeria. From T-test result, we can see that Narrow Money (M₁) has no statistical significant effect on Gross Domestic Product in Nigeria, this is shown with the t-test of M₁(0.759952) with p-value of 0.4536. From the same table the F-Statistics shows that Narrow Money(M₁) has no statistical significant effect on Gross Domestic Product in Nigeria which was represented by M1(1.165467) with p-value of 0.340454 which is higher than 5% level of significance.

Table 4: Modelling economic growth in Model II by OLS: regressing the effect of Broad Money (M2), Interest Rate (INT) and Inflation Rate (INFR) on Gross Domestic Product in Nigeria.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.815136	2.386902	1.598363	0.1212

M2	0.039909	0.045150	0.883918	0.3843
INT	0.015738	0.018996	0.828451	0.4144
INFR	-0.042725	0.044467	-0.960824	0.3449

Adjusted R-squared = 0.117304; F-statistic = 1.240333; Prob(F-statistic) = 0.313761

Source: Authors' Computation using Eviews, 9.0.

From table 4 above, the value of the intercept which is 3.815136 shows that Gross Domestic Product will retain 3.815136 units increase when all other variables are held constant.

The estimated coefficient 0.039909 (M_2) shows that a percent increase in Broad Money Supply will cause about 4% increase in Gross Domestic Product in Nigeria. From the above table the coefficient of multiple determination (R^2) has a value of 0.117304 which is about 12% of change in dependent variables by independent variables. This shows that the model has low goodness of fit. This also shows Broad Money Supply has low outcome on Gross Domestic Product in Nigeria. This means that Broad Money Supply have not statistically contributed significantly on Gross Domestic Product in Nigeria. From T-test result, we can see that Broad Money Supply (M_2) has no statistical significant effect on Gross Domestic Product in Nigeria, this is shown with the t-test of M_2 (0.883918) with p-value of 0.3843. From the same table the F-Statistics shows that Broad Money Supply (M_2) has not statistical significant effect on Gross Domestic Product in Nigeria which was represented by M_2 (1.240333) with p-value of 0.313761 which is higher than 5% level of significance.

Table 5: Modelling economic growth in Model II by OLS: regressing the effect of Liquidity Ratio (LR), Interest Rate (INT) and Inflation Rate (INFR) on Gross Domestic Product in Nigeria.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.679164	4.111944	1.381138	0.1782
LR	-0.017519	0.084453	-0.207444	0.8372
INT	0.013368	0.019615	0.681532	0.5011
INFR	-0.039790	0.044986	-0.884505	0.3840

Adjusted R-squared = 0.094066; F-statistic = 0.969105; Prob(F-statistic) = 0.421145

Source: Authors' Computation using Eviews, 9.0.

From table 5 above, the value of the intercept which is 5.679164 shows that Gross Domestic Product will retain 5.679164 units increase when all other variables are held constant.

The estimated coefficient -0.017519 (LR) shows that a percent increase in Liquidity Ratio will cause a -2% decrease in Gross Domestic Product in Nigeria. From the above table the coefficient of multiple determination also called R^2 has a value of 0.094066 which is also 9% of change in dependent variables by independent variables. This shows that the model has low goodness of fit. This also shows Liquidity Ratio has low outcome on Real Gross Domestic Product in Nigeria. This also implies that Liquidity Ratio have not contributed statistically significantly to Real Gross Domestic Product in Nigeria. From T-test result, we can see that Liquidity Ratio (LR) no statistically significant effect on Gross Domestic Product in Nigeria, this is shown with the t-test of LR (-0.207444) with p-value of 0.8372. From the same table the F-Statistics shows that LR has statistically significant effect on Real Gross Domestic Product in Nigeria which was represented by LR (0.969105) with p-value of 0.421145 which is higher than 5% level of significance.

4. SUMMARY OF FINDINGS AND RECOMMENDATIONS

- Narrow money (M_1) has positive but statistically insignificant effect on the Real Gross Domestic Product in Nigeria; this is confirmed with t-test of M_1 (0.759952) with p-value of 0.4536.

- Broad money supply (M_2) has positive but statistically insignificant effect on the Real Gross Domestic Product in Nigeria. This is confirmed with t-test of $M_2(0.883918)$ with p-value of 0.3843.
- Liquidity Ratio (LR) has negative but statistically insignificant effect on the Real Gross Domestic Product in Nigeria. This is confirmed with t-test of LR (-0.207444) with p-value of 0.8372.

Based on the findings, the following recommendations are made:

- Contraction of monetary policy variables like narrow money and broad money should be done to reduce much influx of money in the economy.
- There should be a consistent fight from the demand and supply side plus political approach by means of political and policy stability. Co-ordination of monetary and fiscal policy implies, among others, fiat monetary restraint which should be matched with lower deficit spending.
- Government should manage information on key macroeconomic variables or factors very well because it has been found from the study that the major driver of inflation is expected consumer price index.
- Federal government through the monetary authorities should revive all monetary policies that affect all sectors in the economy. They should eliminate the ones having little or no effect and modify the significant ones, also taking into consideration the relevance of creating new policies designed for the growth of the economy as a whole.

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