

## Indirect Monetary Policy and Performance of the Nigerian Economy

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### Abstract

*This study was carried out to examine the effect of indirect monetary policy on the performance of the Nigerian Economy from 1993 to 2020. In carrying out the investigation, the researchers made use of various parameters which included real gross domestic product (RGDP) as a variable of economic performance, while open market operations (OMO), monetary policy rate (MPR), cash reserve ratio (CRR) and liquidity ratio (LQR) were used as monetary policy variables. In this study, secondary data were used, while the ex-post facto research design was employed. Multiple regression analyses, unit root tests and co-integration tests were the econometric techniques used for data analysis. The Augmented Dickey-Fuller (ADF) test statistic revealed that the time series properties of the variables were stationary at level, first and second differences. The variables were co-integrated with at least three cointegrating equations for the tested hypothesis. The multiple regression analysis results revealed that indirect monetary policy instruments explained approximately 73 per cent, of total variations in RGDP. The individual variables: OMO, MPR, and CRR were statistically significant to changes in RGDP, while LQR was statistically insignificant. The study found a positive relationship between indirect monetary policy and the performance of the Nigerian economy and further concluded that indirect monetary policy contributed positively to the performance of the Nigerian economy within the period under review.*

**Keywords:** Money supply, direct control, interest rate, inflation, economic stability

### 1. Introduction

Monetary policy measures are actions taken by monetary authorities to control the money supply and a nation's lending cost. It is a deliberate action taken to alter the volume, as well as an economy's credit cost. According to Rose & Hudgins (2008), the apex bank's principal responsibility involves carrying out the necessary economic management through credit and monetary policies such as managing money supply, cost of funds and facilities that enable financial institutions to contribute to the country's national economic objectives. The central bank, by regulating money growth and credit ensures favourable economic growth and reduces unemployment.

Monetary authorities could use direct or indirect control instruments. Direct control and consistent government interference in the financial system earlier adopted by the Nigerian monetary authorities led to the stifling of competition and resource misallocation, necessitating the adoption of an indirect form of monetary policy. The reform emphasized increased reliance on market forces and was adopted to ensure a reduction in distorting decisions on investments, competition enhancement and also developing a financial system that is highly efficient and

sound. The introduction of indirect monetary management in place of the imposition of direct controls on banks was one of the objectives of this reform (Oke, 1993). A significant action taken by policymakers as part of the monetary reform program was the deregulation of interest rates in the last quarter of 1986 and the reorganization and subsequent removal of ceilings in September 1992 for some banks considered sound (CBN, 2014; Axilrod, 1997).

Onoh (2007) states that OMO was introduced in 1993 as a market-based intervention and an indirect instrument of monetary policy aimed at ensuring that adequate funding was available to the economy at all times and that the wild swings in the gap between demand and supply of liquidity were bridged. Since the introduction of the OMO instrument in 1993, the Nigerian monetary authorities have continued to use the cash reserve ratio as an assistant instrument to the OMO instrument, because of its manoeuvrability and because it is easy to engage or disengage the instrument where and when necessary.

One of the basic problems facing any country is how to obtain stability economically. The government had designed and applied several monetary policy instruments in Nigeria with the hope of achieving the desired results of stability (price-wise), low unemployment, economic growth, favourable balance of payment, and a sound banking system, among others but the application and implementation of direct control instruments did not seem to achieve the desired goals.

Also, through selective sectoral allocation of credits and advances, it was hoped that bank credits would be directed more to the economy's real sector. It was also hoped that foreign banks, through the policy, would be persuaded to stop their discriminatory lending policy towards indigenous Nigerian businessmen. Unfortunately, with reckless abandon and flagrant disregard for the rules and regulations of the Central Bank of Nigeria (CBN), the banking system continued to maintain a high liquidity level, thereby frustrating government monetary policy objectives. The government's regulation of interest rate and rate of exchange was also a source of instability in the direct monetary control era. The persistent inadequacies of direct control which was quite too material left the government with no option but to adopt indirect monetary control measures with the hope that a market-driven economy which had produced better economic results in countries comparable to Nigeria, would also bring good results to the Nigerian economy.

Against this background arises the need to assess if this hope of a better-performing economy by the government is being realized. The study therefore investigates the performance of the Nigerian economy after the introduction of the indirect monetary policy.

The general objective of this study is to investigate the performance of the Nigerian economy under indirect the monetary policy regime, while the specific objective is to examine the relationship that exists between Gross Domestic Product and open market operations, monetary policy rate, cash reserve ratio and liquidity rate, in Nigeria between 1993 and 2020.

From the foregoing, it is hypothesized that: There is no significant relationship between Gross Domestic Product and open market operation, monetary policy rate, cash reserve ratio and liquidity ratio.

## 2. Conceptual Review of Related Literature

Every economy desires to aim at a high level of economic performance, growth and development. One way of doing this is through monetary policy. According to Adenikinju and Olaniyan (2006) and Goshit (2012), an essential component in managing macroeconomic issues is monetary policy. The effectiveness of monetary policy is critical to the country's economic performance economically, hence, monetary policy plays a substantial part in output growth for the development of an economy as well as macroeconomic stability.

Monetary authorities of an economy use variables of monetary policy to regulate money supply, credit cost and availability in a country aimed at increasing productivity (Ajudua, *et*

*al.*, (2015); Abdulazeez (2016). Jhingan (2011) defines monetary policy as measures applied by an apex bank to regulate credit conditions in a country. Adebayo (1999) states that it is the combination of measures put together to control money supply and credit conditions in a country which are targeted at realizing national economic objectives. On a similar note, Acha and Asogwa (2013) define the concept as a combination of initiatives designed to control the money supply and its cost in the economy to achieve national economic stability. Therefore, monetary policy is an integral part of macroeconomic policies. This explains the reason why every government makes efforts to improve upon approaches used for such policies.

One of the fundamental macroeconomic instruments employed by the government to manage her economy to attain a stable price level, equilibrium in the balance of payment, employment promotion, sustainable development and increase in productivity is monetary policy. These objectives are essential for the overall attainment of a stable economy and for facilitating long-run real sector growth (Abdulrahman, 2010; Adefeso and Mobolaji 2010; Ajayi, 1974). In their separate contributions, Krugman and Obstfeld (2009) and Anyanwu (1993), noted that macroeconomic policy refers to action by agencies in charge of the management of government policies that are economy-related and involve manipulation of relevant factors to actualize planned goals. From the Nigeria perspective, monetary policy comprises measures by the CBN which are capable of affecting both costs as well as the availability of deposit money banks reserve balances, thereby affecting funds availability and conditions of lending country-wide. A key purpose of the measure is to ensure that over time, money and growth in credit would be sufficient to meet the future requirements of an economy that is experiencing growth and at predictably stable prices.

In Nigeria, since the establishment of the CBN, a lot of reforms have been introduced in monetary management. Afolabi (1999) points out that when the CBN was established in 1959, several monetary management mechanisms were designed to realize the bank's mandate. Before the economic liberalization brought about by the Structural Adjustment Program (SAP) in 1986, the structure and rate of interest were determined by the apex bank and communicated to operators as directives. Hence, savings, deposits and lending rates were usually prescribed by monetary circulars but often depicted the realities of administratively determined, as opposed to market-determined rates. In line with the spirit of the SAP, the CBN in 1987 brought in an interest rate regime that was market-driven.

The apex bank's ability to apply tools considered market-friendly in managing monetary policy was later strengthened following an amendment to the CBN Act of 1991, which empowered the bank with goal autonomy and instruments. Applying these approaches, the CBN can influence relevant economic variables through Open Market Operations (OMO) in combination with Treasury Bills, reserve requirements and Repurchase Agreements Ahuja (2014) defines economic growth as expanding productive capacity or a country's capital stock such that increases in real output or real income can be achieved. This can be facilitated by increasing savings rate, coupled with investment increase. According to him, economic growth enhancement is also an essential goal of monetary policy. Proper implementation of monetary policy using its indirect approach can facilitate Nigeria's economic growth. This could be done by making sure credit is readily available and also cost-friendly. Equally important to note is that when the interest rate is low due to the easy availability of funds, investment is encouraged and economic growth stimulated.

However, when there is a high level of inflation, the CBN adopts a tight monetary policy strategy selling government securities through OMO to mop excess funds in the economy. This measure can be complemented by raising the reserve requirements to curtail the availability of funds to the private sector. Besides, if the CBN increases opportunities for banks to access its credit (that is by raising the MPR and the Repo rate), lending rates will rise and

this discourages private investments. This strategy of tight monetary management works against the promotion of economic growth.

On the other hand, Colander (2001) opines that sufficiently expanded money and improved access to low-priced credit is necessary for ensuring higher economic growth. To some extent, the expansion of money in circulation and bank credit increases aggregate demand thereby worsening inflation. This brings us to the issue of what is needed to balance inflation and growth in an economy. That is to say, with growth as a target, what inflation rate is required using suitable monetary policy? Acha et al., (2016) define inflation as a general price increase in goods and services which are sustained over a period. The inflation rate is determined by a percentage change in the consumer price index (CPI). CPI is used to measure the price of all the representatives of food and services components as manufactured in an economy within a particular period.

Onoh (2002) opines that economic growth can only be sustained in an atmosphere devoid of excessive inflation and damaging deflation. Monetary authorities, therefore, should strive to keep monetary movement in check so that it neither oscillates towards the region of chronic inflation nor to the region of harsh deflation. Therefore, the Monetary Policy Committee of the CBN must design appropriate policies to keep the growth and price objectives in check such that growth in the supply of money in an economy is so controlled that the rate of inflation is reduced to a manageable level, to promote economic growth in Nigeria.

In the discharge of its obligations, the CBN has at its discretion several control mechanisms referred to as “tools” or “instruments” of monetary policy. Henderson and Poole (1991) define a monetary policy instrument as a variable or activity over which the central bank has direct control.

According to Acha (2008) and Oke (1993), as the direct monetary stance of the CBN gave way, indirect policy instruments were adopted to replace them. The policy instruments that became prominent in 1993 are open market operations (OMO), minimum re-discount rate (MRR) which is now known as the monetary policy rate (MPR) and reserve requirements.

Open Market Operation (OMO) implies the selling and purchasing of treasury bills, government bonds other securities in the open market, to individuals, banks, and interested firms. Jhingan (2009) defines OMO as the buying and selling of government securities in the open market (money market) by the apex regulating bank. CBN sells securities to banks to reduce their reserves. As a result, commercial banks are constrained to cut down lending. This discourages additional investment while output is reduced. If the economy is recessionary, the CBN purchases securities to increase bank reserves. This allows them to provide more to the business community and as a result, employment, investment, output, and demand rise.

## **2.2 Theoretical Review of Literature**

Since the beginning of the study of economic phenomenon, monetary theory has witnessed a large number of evolutions. The theory aimed at examining the relationship that exists between economic activities and money. The focus is on how overall economic activities are affected by fluctuations in the stock of money. The monetary theory attempts to explain how price, rate of interest, output, employment and income are determined by demand and supply for money. This is the foundation for formulating monetary policy. This study examined two prominent theories: the quantity theory of money and that of economic growth.

**The Quantity Theory of Money:** This theory relates changes in the supply of money to changes in price and output using the equation of exchange. In classical monetary theory, money is held only to bridge the gap between known receipts and known expenditures. In other words, money is held because transactions take place in discrete time intervals. According to

the classical theory, a change in either the price level or aggregate income will change the demand for money proportionately and in the same direction and a change in how people want to pay for things will cause the demand for money to change proportionately, but in opposite direction (Wrightsmen, 1983).

The root of this theory is based on Jean Bolden's work in the 16th century. Also, John Locke studied money and its impact on trade, interest rate role, and money demand in a country in 1690. Present-day the classical quantity theory of money is based on Irvin Fisher (1867-1947). Fisher argues that as money increases in an economy, prices tend to rise, all things remaining unchanged (Jhingan, 2011).

Fisher consolidated these factors in his famous "equation of exchange" which is  $MV = PT$ . The equation has various interpretations but the one that is of interest to us is the one in which M stands for the demand of money. If we want to isolate the demand for money, M from the other variables in the equation, we can rewrite the equation as  $M = PT/V$ . This equation expresses the demand for money in terms of three variables, where: P represents the price of services and goods, T is the quantity of commodities and services trading in a given period, say a year, PT is the naira amount transacted for services and goods during the year, V is the speed by which the economy wants to expend money. This, Fisher called the "velocity of money," which is measured by the number of times in a year the public wants to spend its money holdings. In other words, V is the public desired annual turnover rate of money. Fisher in his equation believes that the demand for money represented by M, directly varies and proportionately with P which is the price level and that T and V are not changed but directly vary and proportionately with income and expenditure level represented by T at a point P and V remaining unchanged, and that it varies inversely and proportionately with velocity desired denoted V, at a point P and T remain as they were unchanged (Hanson and Orchard, 1983).

Another prominent economist, Milton Friedman advanced the earlier position of the quantity theory by adding a third factor, the cost of holding money. The earlier position was that money demand is determined by income and price levels. The cost of holding money takes two forms which are the real rate of interest that could be enjoyed by an investor, assuming money was lent instead of being held and the rate of increase in the price level that causes money held instead of spent to lose in purchasing power. According to him, an increase in either of these costs can be expected to decrease the quantity of funds people are willing to hold. Contrary, a decrease in real interest or the rate of increase in the level of price reduces the costs of holding funds and this may be expected to increase the quantity of money demanded. At lower holding costs, people will find it attractive to carry larger money balances. Friedman summarized by saying there exists an inverse relation between the demand for money and the cost, or costs of holding money (Boyes & Melvin, 1999).

**The Theory of Economic Growth:** An advocate of the free market, an American economic historian, Walt Rostov posited that national economies should undergo stages of development to achieve improved economic growth in the 1960s. According to him, the stages should be logically followed. The importance of accumulating savings is emphasized for growth to take place and as a condition necessary for moving from traditional to developed economies (Clayton, 1995).

Investment and savings are crucial to Roy F. Harrod and Evsey Domar's independent models of economic growth formulated in 1939 and 1949 respectively. In their opinion, economies must necessarily make savings and invest using some percentages of their income to achieve growth. They argue that by not saving and not accumulating capital, economies fail to develop. The Keynesian argument concerning long-run issues with economic growth with stability was extended by the Harrod-Dormar model. The fact that investment plays a dual role as posited by Keynes, though he ignored its ability to increase productivity capacity due to his

concentration on the short-term was explicated in the Harrod and Domar model of economic growth. Roy F. Harrod and Evsey Dorna argue that if growth with stability were to be actualized, there should be an increase in demand or income at such a rate that will sufficiently ensure full utilization of the increased capacity (Morishima, 1970).

No complicit exists between the stabilization of prices and growth in the national economy in the long run as the right atmosphere is provided by price stability. In the short run, this is not so as there is an inflation and growth trade-off. With sufficient money supply expansion, greater low-priced credit is required to ensure higher economic growth. However, expanding the supply of money and lending by banks may lead to rising aggregate demand and resulting in inflation. When credit is available with easy and low prices, investment is stimulated and by extension, economic growth is quickened. A monetary policy that is tight regarding reserves requirement, bank rate, and report rate limits the credit to the private sector and so discourages private sector investment. A monetary policy that is tight counters economic growth (Ahuja, 2014).

The theory of neoclassical growth holds that real GDP for each citizen grows due to changes in technology including growth in capital per person. The neoclassicals are of the view that the driving force of economic growth is technological changes and their interaction with capital accumulation. Ongoing exogenous technological advances increase the capital's rate of return, increasing savings and investment, increasing capital per person and creating real GDP growth. They argue that economic growth eventually slows down because the rate of return on capital diminishes as the amount of capital increases (King *et al.*, 2006).

One of the major goals of monetary policy is economic stabilization, which was also the primary objective indirect monetary policy in Nigeria sought to achieve. The perceived efficacy of the tools adopted to achieve this, particularly Open Market Operations (OMO), was predicated on the theoretical foundation of the quantity theory and its subsequent modifications that indicate that money supply has implications for price levels. It is therefore believed that contracting/expanding the money supply would control inflation and expand the economy as the case may be.

### 2.3 Empirical Review of Literature

Goshit (2012) examined indirect monetary policy reforms and their impact on the growth of output in Nigeria from 1986 to 2009. Co-integration and ordinary least squares (OLS) were the methods used. Both Augmented Dickey-Fuller and unit root tests were conducted to characterize the time series property of the variables. The outcome of the causality test conducted showed a two-way causality between the studied variables supply of money and growth in output during the reform period in Nigeria. Goshit summited that the banking sector needed to be repositioned to positively respond to issues involved in operationalizing indirect monetary policy, especially in line with various requirements of the apex bank. It is only through this that indirect monetary policy instruments can effectively influence output growth.

Adigwe & Echekeoba (2015) in their attempt to critically evaluate monetary policy and growth in the Nigerian economy, adopted the ordinary least square (OLS) tools to analyze obtained data from 1980-2010. Their results showed that the money policy proxy of money supply showed a positive effect on GDP growth but negatively affected the rate of inflation. A stationary test was conducted and the results provided evidence that differencing once induced were stationarity in five variables (GDP, INF, LR, CR, and EXR), while money supply (Ms) and interest rate (INR) were differenced twice to obtain stationarity. A Durbin-Watson test was conducted and it was discovered that there is no autocorrelation in the series. The overall regression results revealed that there existed a relationship that is both linear and proportionate between GDP and the independent variables but unsatisfactory in explaining variation in inflation ( $R^2 = 17.6$ ). They argued that the transformation of the economy expected via the

monetary policy instruments of liquidity ratio (LR) and cash ratio (CR) policies we not realized for the period under review. Adigwe & Echekeoba observe that monetary policy had not significantly impacted on the inflation rate in Nigeria hence, inflation in Nigeria was attributed to structural rigidity in the country and not a monetary phenomenon.

Udude (2014) in her study “Money Policy and Economic Growth (1981-2012)” examined the effect of several instruments of monetary policy (interest rate, liquidity ratio, money supply and exchange rate) in the facilitation of national economic growth during the reviewed period. Test of stationarity attributes of data showed that all the variables were stationary after the first order except money supply which became stationary at the second difference. The co-integration results indicated variables were into long run relationships. The result of the VECM gave an indication that exchange rate alone significantly affected Nigeria’s economic growth. Furthermore, while other variables were contradictory in results, money supply though insignificant statistically, had sign expected. It was concluded that Nigeria’s economic growth was not significantly determined by the country’s monetary policy in the years 1980-2010.

Goshit & Longduut (2016) in their study of instruments of indirect Monetary Policy and Nigeria’s Poverty Reduction employed multiple regressions model in analyzing data which covered the years 1986 to 2012. Variables used were central bank discount rate (CBDR), interest rate (INTR), bank reserve requirement (BARR), bank credit to economy (BSCE), liquidity ratio of banks ((BLOR), supply of money (Ms), rate of unemployment (UNEMPR), balance of payment (BOP), rate of inflation (INFR), and real RGDP. All listed were independent variables, while the dependent variable was reduction in poverty. Relevant test results indicated that all factors were stationary in the first order except RGDP which became stationary at the second order. Also, the Johansen co integration test results showed four co integrating equations at 5% significance level. Results from granger causality test revealed that there was bi-directional causality moving from INTR to PVR and vice versa and also from INFR to PVR and vice versa. A unidirectional causality was observed moving from RGDP to PVR and from UNEMPR to PVR. The outcome of the study led to the conclusion that it was grossly inadequate for indirect monetary policy measures alone to cause reduction in Nigeria’s poverty level during the studied period.

Owolabi and Adegbite (2014), while investigating monetary policy impact on Nigeria’s industrial growth employed multiple regression tools to test the effect of treasury bills, deposit and lending rates and rediscount rate on manufacturing output. They discovered that deposit rate, lending rate as well as rediscount rates were materially relevant to changes in manufacturing output, while treasury bills had a negative relationship with manufacturing output. The R<sup>2</sup> was 81.35 percent showing a significant relationship between the independence variables on the dependent variable. Owolabi and Adegbite concluded that the rediscount rate and deposit rate positively affected Nigeria’s industrial growth while treasury bills negatively impacted the country’s industrial growth. All the variables were statistically significant.

Ajudua, *et al.*, (2015) in a work carried out to review the Nigerian agricultural sector performance using monetary policy examined the effect of monetary policy tools on the performance of Nigeria’s agricultural sector for the period 1986-2013. Using the method of ordinary least square regression which was utilized in checking the existing link between productivity in agriculture, with dependent variable as agricultural gross domestic product, while interest rate (INT), money supply (Ms), monetary policy rate (MPR), and inflation rate (INF) were explanatory variables. Augmented Dickey Fuller test conducted in the series reveal that MS, INT, INF and MPR were at first difference stationary at 1%, 5% and significance levels but RGDP was stationary at second differencing. Also, a co- integration test conducted showed three co integrating variables at 5 percent significance level, hence, indicating the existence of a relationship with long run equilibrium between the dependent and independent

variables. They concluded that a relationship existed between Nigeria's monetary policy and its manufacturing sector. From the reviewed empirical evidences, it was discovered that monetary policy alone is inadequate in influencing Nigeria's economic growth as well as poverty reduction. The empirical evidences also showed that monetary policy impacted marginally on growth and manufacturing sector of the economy. However, some studies established the existence of a positive relationship between economic growth, and agricultural sector performance and monetary policy. Furthermore, empirical evidences also show the existence of fiscal dominance over monetary policy.

The researcher discovered that there exists a literature gap in the literature reviewed in this study. For instance, Goshit and Longduut (2016), while examining instruments of indirect monetary policy and Nigeria's poverty reduction included real gross domestic product, rate of inflation, balance of payment and rate of unemployment as independent variables proxy of indirect monetary policy instruments which are clearly not indirect monetary policy instruments.

Also, Adigwe and Echekoba (2015) and Udude (2014), while study monetary policy and economic growth used exchange rate as monetary policy instrument. Exchange rate is not a monetary policy instrument but a performance indicator variable. The preferable variable(s) should have been monetary policy rate or cash reserve ratio or both.

### 3. Methodology

The design used in this study was ex post facto. This design was utilized because the study has some descriptive and experimental features. It is descriptive because the researcher has no control over the experimental conditions, while it is experimental because an attempt is made to infer causal relationships which differ in important ways. The econometric approach of ordinary least square (OLS) analytical method was employed to analyze data obtained for this study. Specifically, multiple regression analysis was used to test the hypothesis formulated. Augmented Dickey-Fuller (ADF) test was used to check the presence of unit root in the time series data, while the Johansen's co-integration test was employed to determine the long run relationship between the dependents and independents variables.

The data were analyzed with the aid of Econometric Views (E-views) statistical software package. The t-test was used to measure the statistical significance of the regression coefficients and to determine the flow or direction of the relationship existing between dependent and independent variable. The F-test measured the adequacy or appropriateness of the model, to arrive at a conclusion on the statistical significance of the coefficient of determination (R<sup>2</sup>). The test of the hypothesis earlier stated was done at 5 percent (5%) level of significance, as such, the generalization of this study's findings is limited to this extent. The t-test and F-test results which were generated based on econometric views (E-Views) statistical software package was compared with the tabulated t and F statistics respectively at P = 0.05. The R<sup>2</sup> measured the proportion of the variation in Y which is "explained" by multiple regression equation. R<sup>2</sup> is often used as a goodness-of-fit statistic and to compare the validity of regression results under alternative specifications of the independent variables in the model.

The F-statistic with N-K-1 degree of freedom allows for the test of the hypothesis that none of the explanatory variables helped in explaining the variation of Y about its mean. In other words, the F-statistic test the joint hypothesis that  $B_1 = B_2 = \dots = B_k = 0$ . If the null hypothesis is true, then we would expect RSS, R<sup>2</sup>, and therefore F to be close to 0. Thus, a high value of the F-statistic is a rationale for rejecting the null hypothesis.

Consequently, the decision rule for accepting or rejecting the hypotheses was based on:

- (i) Accept H<sub>0</sub> if  $F_t 0.05 > F_c$
- (ii) Refused to accept H<sub>0</sub> if  $F_t 0.05 < F_c$



That is, we accept the null hypotheses (H0) and reject the alternative hypotheses where the tabulated or critical F value was greater than our computer-generated F value at a 5% level of significance and vice versa. Similarly, the significance of the parameter estimates of our test was considered at where;  $t_c > t$  and insignificant and not considered at where  $t_c < t$ .

**Empirical Specification of Models**

Model one

Statistical specification

$$RGDP = f(OMO, MPR, CRR, LQR) \dots \dots \dots \text{Equation 3.1}$$

Econometric Specification

$$RGDP = b_0 + b_1OMO + b_2MPR + b_3CRR + b_4LQR + \mu_i \dots \dots \dots \text{Equation 3.2}$$

Where RGDP, = Real Economic Growth, OMO = Open Market Operations, MPR = Monetary Policy Rate, CRR = Cash Reserve Ratio while LQR = Liquidity Ratio. Also  $\mu_i$  = error term,  $b_0$  = base constant, while  $b_1 \dots b_4$  = regression coefficients.

**4. Data Presentation, Analysis and Discussion of Findings**

**Data Presentation**

**Table 1: Trend of RGDP as dependent variable and OMO, MPR, CRR, and LQR as independent variables.**

YEAR	RGDP(₦'billions)	OMO(₦'billions)	MPR(%)	CRR(%)	LQR(%)
1993	19927.99	7037.9	26.0	6	42.2
1994	19979.12	18640.1	13.5	5.7	48.5
1995	20353.2	13182.5	13.5	5.8	33.1
1996	21177.91	19569.7	13.5	7.5	43.1
1997	21789.1	9294.5	13.5	7.8	40.2
1998	22332.87	4720	13.5	8.3	46.8
1999	22449.41	13966	18.0	11.7	61
2000	23688.28	26508.3	14.0	9.8	64.1
2001	25267.54	32245.1	20.5	10.8	52.9
2002	28957.71	49332.4	16.5	10.6	52.5
2003	31709.45	66220.6	15.0	10	50.9
2004	35020.55	91260.5	15.0	8.6	50.5
2005	37474.95	86486.7	13.0	9.7	50.2
2006	39995.5	150701.7	10.0	4.2	55.7
2007	42922.41	298550	9.5	2.8	48.8
2008	46012.52	194283.3	9.8	3	44.3
2009	49856.1	42415	6.0	1.3	30.7
2010	54612.26	22562.5	6.3	1	31.7
2011	57511.04	196842.5	12.0	8	42
2012	59929.89	376021	12.0	12	48.3
2013	63218.72	870661.7	12.0	12	63.2
2014	67152.79	701891	12.0	16.3	38.3

2015	69023.93	67543.1	12.5	24	39.6
2016	67931.24	7859.6	14.0	20	45.9
2017	68490.98	11147.8	14.0	22.5	54.8
2018	69799.94	22350.2	14.0	22.5	32.4
2019	71387.83	20723.6	14.0	22.5	35.8
2020	70014.37	6453.9	11.5	27.5	38

**Source:** CBN Statistical Bulletin and National Bureau of Statistics Annual Reports (2013, 2014, 2015, 2019 and 2020), CBN Annual Reports and Statements of Accounts for various years.

Table 1 underpins the analytical framework for this study. It is pivotal to and a springboard from which subsequent data and tables are extracted and analyzed, specifically for the index of economic performance against indirect monetary policy. The data presented in Table 1 covers the period of twenty-eight years (28), (1993-2020). In it, it is shown that indirect monetary policy is examined in terms of open market operations (OMO), monetary policy rate (MPR), cash reserve ratio (CRR), and liquidity ratio (LQR). Economic performance is examined in terms of gross domestic product (RGDP).

### Test of Hypothesis

Table 2: Ordinary Least Square (OLS) estimation results from Hypothesis  
Dependent variable (LogRGDP)

	Coefficient	StdErrors	t-statistics	prob.
C	13.52772	1.015292	13.30426	0.0000
Log (OMO)	0.102206	0.041755	2.447768	0.0224
Log (MPR)	-1.19029	0.262357	-4.536907	0.0001
Log (CRR)	0.467701	0.079407	5.889943	0.0000
Log (LQR)	-0.519690	0.307492	-1.690092	0.1045

$R^2 = 0.7262$  Adjusted  $R^2 = 0.6787$  F-stat = 15.2558 prob (F-stat) = 0.000003 Durbin–Watson Stat = 1.000

**Source:** Authors' computation from E-views 9 (2019).

The estimation of the model based on the hypothesis shown in Table 2 reveals that the coefficient of multiple determinations ( $R^2$ ) of 0.7262 indicates that approximately 73% of the total variation in the dependent variable was caused by the explanatory variables. This implies that about 73% of variations in real gross domestic product were caused by open market operations, monetary policy rate, cash reserve ratio and liquidity ratio, while the remaining 27% were caused by variables not captured in the model. The test of significance showed that three variables (OMO, MPR and CRR) were statistically significant at a 5% significance level with t-probability values of 0.0224, 0.0001 and 0.0000 respectively were less than 0.05. It means there is a statistically significant relationship between these variables and real gross domestic product. However, LQR was statistically insignificant at a 5% significance level with a t-probability value of 0.1045 which is greater than 0.05. Also, MPR and LQR have negative relationships with RGDP.

The OMO coefficient of 0.102206 shows that a 1% increase in OMO leads to an increase in RGDP by 0.102206 and 1% increase in CRR with a coefficient of 0.467701, leads to a 0.467701 increase in RGDP, while a 1% increase in MPR with coefficient -1.190291 will decrease RGDP by -1190291 and a 1% increase in LQR with coefficient -0.519690 also leads

to a decrease of - 0.519690 in RGDP. The coefficient of OMO, 0.102206, MPR, -1.190291, CRR, 0.467701 and LQR -0.519690 all appear with the expected signs and conforms to expectations. The F statistic value of 15.26 is an indication that the entire regression model was a good fit and further confirms the value of R<sup>2</sup>. With these findings, we reject the null hypothesis and accept the alternative hypothesis that there is a positive relationship between monetary policy instruments and real gross domestic product.

### **Discussion of Findings**

The stationary test findings revealed that all the variables were stationary at level, first difference or second difference. Specifically, OMO, MPR and LQR were stationary at level 1(0), while CRR became stationary at first difference 1(1). RGDP obtained was stationary only at second difference 1(2). The study also discovered that there is a long-run equilibrium relationship among variables of monetary policy and that of economic performance as revealed by Johansen Co integration test results conducted for the hypothesis formulated in this study.

From the hypothesis it was discovered that monetary policy variables caused 73% variations in RGDP, while the remaining 27% variations were caused by variables not captured in the model. Findings further revealed that OMO, MPR and CRR can significantly cause a statistical change in RGDP. However, this finding conflicts with the works of Abdulazeez (2016), which discovered a marginal impact on Nigeria's economic growth, because of alteration in monetary policy. The F-statistics value of 15.26 is an indication that the regression model is a good fit. The null hypothesis was rejected and the alternative hypothesis was accepted, implying there is a significant relationship among variables of monetary policy and RGDP.

### **5 Conclusion**

Monetary policy is designed to mop up excess liquidity or inject the same into the economic system through the application of open market operations, reserve requirements and the monetary policy rate. The study attempted to empirically investigate monetary policy and the performance of the Nigerian economy for the period 1993 to 2020, using the ordinary least square (OLS) regression method. The analysis was done using four monetary policy instruments (OMO, MPR, CRR, and LQR) to investigate the performance of the Nigerian economy using RGDP as a proxy for economic performance.

It was concluded that monetary policy positively influenced the Nigerian economy during the period 1993. However, there is a need to further improve the performance of the economy, if the government will avoid the use of funds generated as a result of monetary policy operations to service public debts. Also, monetary authorities must understand the distinction between debt management and monetary policy operations.

#### **5.1 Recommendations**

- i. The government should keep the benchmark interest rate reasonably low to boost economic performance.
- ii. To boost RGDP in Nigeria it is recommended that the government should emphasize the use of OMO instruments.
- iii. The government should develop the money market for the effective operation of the instrument of open market operations.
- iv. Also, funds generated through OMO should not be injected back into the economy. A special account should be created where such funds are kept until the policy is reversed.

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**Appendix**

Table 3: Regression Results  
 Dependent Variable: LOG (RGDP)  
 Method: Least Squares  
 Date:10/29/21Time:10:16  
 Sample:1993 2020  
 Included observations:28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	13.50772	1.015292	13.30426	0.0000
LOG(OMO)	0.102206	0.041755	2.447768	0.0224
LOG(MPR)	-1.190291	0.262357	-4.536907	0.0001
LOG(CRR)	0.467701	0.079407	5.889943	0.0000
LOG(LQR)	-0.519690	0.307492	-1.690092	0.1045
R-squared	0.726265	Mean dependent var	10.58188	
Adjusted R-squared	0.678659	S.D. dependent var	0.483038	
S.E. of regression	0.273819	Akaike info criterion	0.407735	
Sums quared resid	1.724470	Schwarz criterion	0.645629	
Log likelihood	-0.708290	Hannan-Quinn criter.	0.480461	
F-statistic	15.25575	Durbin-Watson stat	1.000297	
Prob (F-statistic)	0.000003			

Table 4: Augmented Dickey Fuller (ADF) Unit Root Test Results

Variables	T Statistics	Critical Values (5%)	Prob.	Order of integration
RGDP	-4.446845	-2.986225	0.0018	1(2)
OMO	-3.234134	-2.998064	0.0201	1(0)
MPR	-4.510708	-2.976263	0.0014	1(0)
CRR	-4.729357	-2.976263	0.0009	1(1)
LQR	-3.157997	-2.976263	0.0308	1(0)