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ABSTRACT

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I. INTRODUCTION

The issue of monetary policy and selected macroeconomic variables has generated a lot of scholarly argument. The inevitability for a structure that can help comprehend the link seems self-evident. A crucial point to the policy makers is the outstanding role of monetary policy because of the significance it can have on an economy. Various scholars view is that of discretionary control of money supply by monetary authorities aiming to realizing stated or anticipated objectives. Amarasekara (2006) opined that there is a long run relationship between money, output and inflation though monetary aggregates have increasingly fallen out of favour as intermediate targets.

With the establishment of the apex bank in Nigeria on July 1957, the stage was set for new era in which monetary policy could be used as instrument of economic management. The period of control regime similarly experienced a weakness in the efficacy of monetary policy.

The Central Bank of Nigeria (CBN) since its establishment has continued to play the traditional role of regulating the stock of money in the economy through the use of monetary policy instruments and targets): Open market Operation, Liquidity ratio, cash reserve requirements, directives, moral suasion, that is usually targeted towards the achievement box of full employment equilibrium, rapid economic growth, price stability, external balance (Fasanya and Onakoya, 2013). This is very evident in the emergence and rise of an active money market where treasury bills for example have grown in volume and value becoming key earning assets for investors and source of balancing liquidity in the market. A major instrument used by Central Bank is credit rationing guidelines which basically sets

the rates of interest for the components and aggregates of commercial bank loans and advances to the private sector.

In the past years, the nation has been regulating the economy through disparities in her stock of money. There are positive returns on the monetary policy impact on macroeconomic variables if it is prudently functional but there are various limitations of unpredictability and insufficiency faced by the Central Banks in applying monetary policy. The problem arises when it struggles among the aims and tools of other strategies. The insufficient application of the numerous policies and irregularity in them are the key glitches of monetary policy effect on macro-economy. The monetarist believes that escalation in money supply will be inflationary without any result on investment, employment and aggregate demand. Reasons for differences in the response of macroeconomic variables to monetary policy include differences in the development level of financial markets, in the accountability and priority of the central banks, in the openness of economies, and in price and wage rigidities (Ivrendi and Yildirim 2014). The inability of the monetary policy in controlling price oscillation has caused growth vacillation as record of growth and development has been dismal. Notwithstanding the numerous monetary regimes put in place by the Central Bank of Nigeria in the past, inflation still remains a major threat to Nigeria's economic growth (Adigwe, Echekoba and Onyeagba, 2015). However, the Nigeria economy as at present lacks the fundamental to make this work. Ayodeji and Oluwole (2018) stated that monetary policies can only produce desired result if a highly integrated and monetized economy with an effective networking system is available.

There are quite a number of studies from Nigeria that have investigated the impact of monetary policy on the macroeconomic variables (Fasanya, 2013), which has largely focused on how aggregate output and prices, as well as other variables respond to unanticipated monetary impulses. Most studies have focused largely on the monetary policy neutrality in the long run and on developed countries (Asongu, 2013). However, literature is scant on the effects of unanticipated changes on the sectoral components of aggregate output, although, Nwosa and Saibu (2012) conducted such study. The broad objective of this study is to evaluate the impact of monetary policies on selected macroeconomic variables in Nigerian economy. Furthermore, the specific objectives include: To determine the relationship between monetary policy and index of industrial production in Nigerian economy; to determine the relationship between monetary policy and lending rate in Nigerian economy; to determine the relationship between monetary policy and inflation rate in Nigerian economy and to ascertain the relationship between monetary policy and consumer price index. This study considered the effect of monetary policy on macroeconomic variables with statistical information on the variables employed hoping to find useful results.

II. REVIEW OF RELATED LITERATURE REVIEW

Monetary Policy- Monetary policy seeks to influence the rate of aggregate spending by varying the degree of liquidity of various constituents of the economy including banks, firms, business houses and households. It means the effect of the action of monetary authorities on the stock of money on the number of currency notes in people's pockets or the quantity of deposits on the books of banks (Imoughele and Ismaila 2014). Furthermore, in the Keynesian theory, monetary policy plays a crucial role in affecting economic activity. It contains that the change in supply of money can permanently change such variables as the rate of interest, the aggregate demand and the level of employment, output, income (Jelilov, Gylych, Onder and Evren 2016). During recession, the level of expenditure increases the amount of cash and other liquid assets (e.g., short and long-term government securities) at the disposal of the community and by making borrowing situations easier through

lower rates of interest. Inflationary situation makes monetary policy seek to restrict aggregate spending by dipping the total amount of liquid assets with the community and by making borrowing costlier.

Theoretical Framework - This study anchors on Keynesian theory of money and the quantity theory of money. This is because these two theories best explain the situation of monetary policy. The Keynesian theory is hinged on the conception of price inelasticity and likelihood of an economy operating below full employment level of output, income and employment, this model adopts a limited economy and a flawless efficient market with equitable price. Under this, monetary policy performs a vital function in impacting the economic, it deals with the issue of transformation in the supply of money leading to variation of such variables as the rate of interest, the aggregate demand and the level of employment, output and income (Jelilov, Gylych; Onder, Evren, 2016). Keynes considers the reality of unemployment equilibrium, it means that a rise in money supply may lead to growth in the level of output and as well the eventual effect of money supply on the price level hinge upon its influence on aggregate demand and the elasticity of the supply of aggregate output (Jhingan, 2010). The Keynesians believe that changes in money supply might spur a rise or fall in interest rate. A decline in interest rate will impact total investment and improve total income and output. This is established on the idea that interest rate is the basic element of outlay in the market economy. This comprises the employment of factors such as labour and capital which lead to increase in total employment (Nwoko, Ihemeje & Anumadu 2016). From the Keynesian mechanism, interest rate affects investment decisions and consequently, output and income and the multiples process (Amacher and Ulbrich, 1989).

The classical quantity theory was influentially restated by Milton Friedman and Anna Schwartz(1963). This theory asserts that the general price level is directly proportional to the amount of money in circulation. The classical monetary theory developed over intensive efforts and involvement of economists like Jean Baptist Say, Adam Smith, David Richardo, Pigu and others who shared the same beliefs, the classical model attempts to explain the determination, savings and investment with respect to money (Onyiewu, 2013). According to the classicist, money is a shroud and an equilibrium in its effect on the economy (Jhingan, 2010). This theory posits that the vital role of money is to perform as medium of exchange, it necessitates the general level of prices in which goods and services will be exchanged. This link among money and the price level is explained in terms of the quantity theory of money (Jelilov, Gylych; Muhammad Yakubu, Maimuna, 2015).

Of recent the Keynesian has come to dominate the discourse. Without an exogenous money supply, the price level becomes unspecified and interest rate rules makes inflation and deflation unguided, pure expectation processes. Most markets are also vague in the moneyless neo-Keynesian world, while price inflexibility of financial contracts may have unruly significances in deflationary system. Money as insignificant term, as conflicting to cash, is a requisite characteristic of contemporary economies. Nominal price inelasticity elongate equilibrium, but are of the principle of a monetary economy.

Keynes major aim boils down to expounding on the inability of monetary policy to arouse the economy after the crisis of the 1930s, described as the Liquidity Trap. In contrast, the argument aided the dissemination of the Quantity Theory of Money (QTM). "to sustain the equilibrium among demand and supply for money, fluctuations in the insignificant money supply harmonizes deviations in prices. The debate about 'inflation been a monetary phenomenon' is right as a depiction of long-run equilibrium. The recognition that inflation is triggered by surplus money - by non-economists or Keynesians - shows the Quantity Theory of Money is prevailing.

III. RELATIONSHIP BETWEEN MONETARY POLICY AND MACROECONOMIC VARIABLES

There is a convention that some connection occurs between the monetary policy and macroeconomic variables. The Central Bank of Nigeria since its creation functions traditionally to maintain stability in the economy by employing the most suitable instrument of monetary policy geared in the direction of the attainment of macroeconomic objectives which include among others money supply, employment, inflation rates, interest rates, economic growth etc. The basic issue arises as to whether the effects of a monetary policy shock on macroeconomic variables are as theoretical expectation. This is because macroeconomic variables are non -stationery (Forsona and Janrattanagul, 2014). Monetary policy controls the level of liquidity in the economy so as to improve economic growth and reduce inflation. The monetary policy tools (interest rates and bank reserve requirements) in operation affect how much banks can lend to customers while the volume of loans affects the money supply (Amadeo, 2019). Central banks have three vital monetary policy objectives. The imperative is to manage inflation. The secondary objective is to reduce unemployment, which comes up after controlling inflation. The third objective is to promote modest interest rates.

For monetary policy to be efficient, there should be no delay in policy implementation- no time gap between the need for taking action and recognition of the need for taking action. Although in the pragmatic scenario, execution mostly is not instant, in terms of recognition and the actual action taken. This time difference involves the observation for some time to identify that the economy has transmuted in such a way as to necessitate a change in the existing policy. The action lag may again depend upon a number of factors. The sum of recognition lag and action lag is called the inside lag. The inside lag is affected by policy trade-offs and primacies as well as by the speed of data collection and analysis for administrative action. Once the policy is changed, sometime must elapse before the variations in the policy work their way through the system to become effective in changing aggregate output or employment. There is no consensus amongst economists about the optimum duration of these lags.

IV. EMPIRICAL REVIEW

Empirical literature in middle income economies show that monetary policy shocks have little or no effects on economic parameters. Nwoko, Ihemeje and Anumadu (2016) studied the impact of monetary policy on the economic growth of Nigeria and found that the average price and labor force have significant influence on gross domestic product while money supply was not significant. In the same vein, Adekunle, Alalade and Okulenu (2016) using a multiple regression analysis of the ordinary least square method found out that interest rates have an adverse effect on capital market growth. Moses, Imoisi and Opara (2014) using Dickey fuller test, co-integration test and error correction model to test the hypothesis of monetary policy effectiveness in Nigeria found that monetary policy exerts moderate impact on the selected macroeconomic variables in Nigeria. In addition, the impact of monetary policy on selected macroeconomics variables in Nigeria economy generated large volumes of empirical studies with mixed findings using regression analysis of ordinary least square method. Akinjare, Babajide and Okafor (2016) revealed the monetary policy and its effectiveness on economic development in Nigeria using ordinary least square method. It was revealed that exchange rate, interest rate and money supply is significant in impacting the economy, inflation proves otherwise.

Tule, Ogundele and Apinran (2018) in presenting a review on efficacy of monetary policy instruments on economic growth influence variables like consumer price index, real exchange rate, money supply and interest rate using Johansen multivariate co-integration approach and vector error correction model found that consumer price index, real exchange rate, money

supply and interest rate were significant monetary policy instruments that propelled economic growth in Nigeria during the period under review. The study of monetary policy and Nigeria's economy found that monetary policy in Nigeria does not have significant effect on the economy using multi regression and student t-test (Ekwe, Ogbonnaya and Omodero, 2017). George, Suoyai, Temal and Boloekeye (2018) using Ex-post facto found that exchange rate has an insignificant impact on inflation and real gross domestic product in their research on impact of money supply on some macroeconomics variables on the Nigerian economy. Imoughele and Ismaila (2014) presented empirical investigation of the impact of monetary policy on manufacturing sector performance in Nigeria (1986-2012) using unit test root Granger causality test, co-integration and VAR mode revealing that manufacturing sector contribute insignificantly to the Nigerian economy. The impact of monetary policy on selected macroeconomic variables in Nigerian economy has been discussed in many empirical studies of developing countries. But the finding those studies differ and cannot be generalized. In the study monetary policy shocks and macroeconomic variables, Popkarn (2018) revealed that there is significant feedback relationship among the six variables in the specified SVEC model.

Monetary policy has gone a long way to influence macroeconomic variables; economic growth, employment, inflation, interest rate etc. Does monetary policy influence economic growth was a research work carried out by Adegbemi, Mariam and Fasanya et al (2013) using error correction model to show that inflation rate, exchange rate and external reserve are significant monetary policy instruments that drive growth in Nigeria. Chipote and Makhetha_kosi (2014) investigated the impact of monetary policy on economic growth using Johansen co-integration and error correction mechanism. The empirical results indicated that money supply repo rate and exchange rate are insignificant monetary policy instruments that drive growth while inflation is significant. There is a relationship between monetary policy and economic growth. Onyeiwu (2012) employed ordinary least square method and found that monetary policy presented by money supply exerts a positive impact on GDP growth and balance of payment but negative impact on rate of inflation in his study monetary policy and economic growth. There is always a great impact on macroeconomic variables whenever there is a change in the application of monetary policy. Nasko (2014) studied the impact of monetary policy on the economy of Nigeria employing multiple regression analysis. The variables are interest rate, and exchange rate and money supply and the result showed there is marginal impact due to change in monetary policy application. Monetary policy has positive or negative impact on macroeconomic variables. Money supply, interest rate and inflation rate negatively effect on the real GDP per capital in the long run and only the real exchange rate has a positive sign (Khaysy and Gang, 2017).

Monetary policy impact on macroeconomic variables is significant. Abdul (2018) presented impact of monetary policy on economic growth revealing that monetary policy has significant effect on inflation rate, money supply, employment, gross capital formation, foreign direct investment, savings and other macroeconomic variables using multiple regression method. Likely, Ufoeze, Odimgbe, Ezeabalisi and Alajekwu (2018) research on effect of monetary policy on economic growth in Nigeria and its variables are lending rate and investment. Using ordinary least square method found that interest rate and investment have significant positive effect on economic growth in Nigeria. Furthermore, Adigwe, Echekoba and Onyeagba (2015) noted that their research study, monetary policy and economic growth that monetary policy represented by money supply exerts a positive impact on GDP growth but negative impact on the rate of inflation using ordinary least square method. Monetary policy influence on macroeconomic variables is sometimes significant and sometimes insignificant. The study of effect of

monetary policy on economic growth in Nigeria found the money supply, interest rate and investment have significant positive effect on economic growth in Nigeria.

Validity of monetary policy impact on macroeconomic variables is in financially developed economies. Adegbite and Alabi (2013) worked on the monetary policy and economic growth using multiple regression method and found that money supply, inflation, exchange rate, interest rate and gross domestic product have significant effect on the economic growth with the adjusted R^2 of 50% and also Enoch and Nicholas (2018) reveals that relevancy of monetary policy in supporting economic growth, mainly in financially developed economies with fairly independent central bank using error correction model in their study monetary policy and economic growth. In conclusion, Ajibola and Adeyemi (2018) opined that money supply and exchange rate had a positive but fairly insignificant impact on economic growth using error correction model in their analyzed study of impact of monetary policy on economic growth in Nigeria.

V. METHODOLOGICAL DIMENSION

This study makes use of the ex-post facto research design. This involves analysis of the past quantitative data in order to make generalizations about the relationship between the variables. Time series data of the variables were used to assess the relationship that exists between them. The broad objective of this study is to evaluate the impact of monetary policies on selected macroeconomic variables in Nigerian economy. To achieve this aim, the researcher used Monetary Policy Rate (MPR), Cash Reserve Ratio (CRR) and Liquidity Ratio (LQR), to represent monetary policy variables, While Index of Industrial Production (IIP), Consumer Price Index(CPI), Lending Rate (LR) and Inflation (INF) rate were selected for macroeconomic variables. It is hypothesized that index of industrial production, lending rate and inflation rate are all functions of Interest rate, Cash Reserve Ratio and Liquidity Ratio, the functional relationship can be expressed thus;

$$IIP = f(MPR, CRR, LQR) \quad (1)$$

$$LR = f(MPR, CRR, LQR) \quad (2)$$

$$INF = f(MPR, CRR, LQR) \quad (3)$$

The functional model can further be expressed in econometric terms thus;

$$IIP = \alpha_0 + \alpha_1 MPR + \alpha_2 CRR + \alpha_3 LRQ + \mu_t \quad (4)$$

$$LP = \alpha_0 + \alpha_1 MPR + \alpha_2 CRR + \alpha_3 LRQ + \mu_t \quad (5)$$

$$INF = \alpha_0 + \alpha_1 MPR + \alpha_2 CRR + \alpha_3 LRQ + \mu_t \quad (6)$$

$$CPI = \alpha_0 + \alpha_1 MPR + \alpha_2 CRR + \alpha_3 LRQ + \mu_t \quad (7)$$

Where μ_t, is the error term which is assumed to be normally distributed, with zero mean and α_0 is a constant, an intercept, which represents what the macroeconomic variables will be irrespective of the value of the monetary policy variables. While α_1, α_2, α_3, α_4, α_5, α_6, represent the value of the macroeconomic variables in response to 1% change in value of the monetary policy variables. This could also be referred to as coefficients of the regression. The independent variables which are monetary policy variables include; monetary policy rate, cash reserve requirement and liquidity ratio. These are the variables that individually and collectively affect the dependent variables. Monetary policy rate, Cash reserve requirement and liquidity ratio, inflation rate and lending rate are all expressed in percentages, while index of industrial production is expressed in an index form.

The priori expectation is such that increase in the monetary policy variables should negatively affect inflation and positively affect index of industrial production and lending rate. In other words, it is expected that an upward review of the monetary policy would cause inflation to fall, and cause lending rate and index of industrial production to rise.

VI. DATA PRESENTATION AND ANALYSIS

The table contains the mean, the median, maximum values, minimum values standard deviation and other statistics that describe the characteristics of the variables. The mean represents the average figure of the variable over the period under review. The Standard deviation is an indicator of deviation from the mean. The maximum value represents the highest value of the variable over the period under review, while the minimum value represents the lowest value of the variables over the period under review.

Descriptive Statistics of the Variables

	MPR	CRR	LQR	LR	INF	IIP
Mean	13.61621	852.7066	40.30000	18.88000	18.59690	135.0790
Median	13.50000	125.2600	40.00000	17.98000	12.00000	133.9000
Maximum	26.00000	4699.700	64.10000	29.80000	76.80000	158.9000
Minimum	6.000000	0.000000	25.00000	13.54000	0.200000	117.6000
Std. Dev.	3.893025	1445.058	11.20634	3.294138	17.87838	10.58432
Skewness	0.786532	1.543196	0.416427	1.568659	2.030560	0.507028
Kurtosis	5.252331	3.794251	2.032590	5.872328	6.183326	3.011624
Jarque-Bera	9.119929	12.27261	1.969015	21.86241	32.17340	1.242706
Probability	0.010462	0.002163	0.373623	0.000018	0.000000	0.537217
Sum	394.8700	24728.49	1168.700	547.5200	539.3100	3917.290
Sum Sq. Dev.	424.3581	58469393	3516.300	303.8376	8949.822	3136.776
Observations	29	29	29	29	29	29

Source: E-views 10.0

The descriptive statistic reveals that the mean values of monetary policy rate (MPR), cash reserve requirement (CRR), liquidity ratio (LQR), lending rate (LR), inflation rate (INF) and index of industrial production (IIP) over the period under review are 13.6%, ₦852.7billion, 40.3%, 18.8%, 18.6% and 135.1 respectively. The Jarque-Bera test statistics show that only IIP and LQR are normally distributed. CRR and INF shows very high deviation from the mean. The highest values for MPR, CRR, LQR, LR, INF and IIP are 26%, ₦125.3billion, 64.1%, 29.8%, 76.8% and 158.9 respectively.

The time series data were analyzed using the ordinary least square (OLS) method. The OLS method of regression procures several estimates which were used to analyze the data. These estimates include the regression coefficients, the probability values, the R-squared and adjusted R-squared, the F-statistic, and the Durbin-Watson statistic. The interpretation of the results will be done sequentially in line with the research objectives.

Regression Output for Monetary Policies and Index of Industrial Production

	Variable	Coefficient	Std. Error	t-Statistic	Prob.
	MPR	0.130	0.488	0.267	0.791
	CRR	0.001	0.001	0.909	0.371
	LQR	0.579	0.194	2.982	0.006
	C	108.840	8.838	12.314	0.000
R-squared		0.323	Mean dependent var		135.079
Adjusted R-squared		0.242	S.D. dependent var		10.584
S.E. of regression		9.213	Akaike info criterion		7.406
Sum squared resid		2122.231	Schwartz criterion		7.595
Log likelihood		-103.3967	Hannan-Quinn criter		7.465
F-statistic		3.983	Durbin -Watson stat		1.062
Prob(F-statistic		0.018			

Source: Eviews 10.0

Monetary Policy Rate, cash reserve requirement and liquidity ratio have positive relationships with index of industrial in Nigeria. With a coefficient of 0.130856, 0.001272 and 0.579950, it follows that unit increases in MPR, cash reserve requirement and liquidity ratio will respectively result in a rise of 0.130856, 0.001272 and 0.579950 in lending rate in Nigeria. LQR is found to be a very significant monetary policy variable affecting the index of industrial production. The R-squared and Adjusted R-squared values are 0.323436 and 0.242248 respectively; indicating that just about 32% of the variations in index of industrial production can be explained by variations in the monetary policy variables. The Durbin Watson Test statistic (1.062957) falls in between the tabulated lower and upper limit (n = 29, k = 3) which are 0.988 and 1.418 respectively. Therefore, there is inconclusive evidence of positive autocorrelation.

Regression Output for Monetary Policies and Lending Rate

	Variable	Coefficient	Std. Error	t-Statistic	Prob.
	MPR	0.431	0.151	2.840	0.008
	CRR	-0.000	0.000	-1.831	0.079
	LQR	-0.055	0.060	-0.913	0.369
	C	15.909	2.749	5.785	0.000
R-squared		0.323	Mean dependent var		18.880
Adjusted R-squared		0.242	S.D. dependent var		3.294
S.E. of regression		2.866	Akaike info criterion		5.071
Sum squared resid		205.430	Schwartz criterion		5.260
Log likelihood		-69.537	Hannan-Quinn criter		5.130
F-statistic		3.991	Durbin -Watson stat		2.474
Prob(F-statistic		0.018			

Source: Eviews 10.0

Monetary Policy Rate has a positive relationship with lending rate while cash reserve requirement and liquidity ratio have negative relationships with lending rate in Nigeria. With a coefficient of 0.4316, -0.000797 and -0.05526, it follows that unit increases in MPR, cash reserve requirement and liquidity ratio will respectively result in a rise of 0.4316 and a decrease of 0.000797 and 0.05526 in lending rate in Nigeria. MPR is also seen to be a very significant monetary policy variable for controlling of lending rate. The R-squared and Adjusted R-squared values are 0.323881 and 0.242747 respectively; indicating that just about 32% of the variations in interest rate can be explained by variations in the monetary policy variables. The Durbin Watson Test statistic (2.474315) is above the tabulated upper limit (n = 29, k = 3) which is 1.418. Therefore, there are no traces of positive autocorrelation.

Regression Output for Monetary Policies and Inflation Rate

	Variable	Coefficient	Std. Error	t-Statistic	Prob.
	MPR	-2.168	0.859	-2.523	0.018
	CRR	-0.004	0.002	-1.821	0.080
	LQR	0.647	0.342	1.891	0.070
	C	18.965	15.551	1.219	0.234
R-squared		0.265	Mean dependent var		18.569
Adjusted R-squared		0.177	S.D. dependent var		17.878
S.E. of regression		16.211	Akaike info criterion		8.536
Sum squared resid		6570.224	Schwartz criterion		8.725
Log likelihood		-119.782	Hannan-Quinn criter		8.595
F-statistic		3.018	Durbin -Watson stat		1.089
Prob(F-statistic		0.048			

Source: Eviews 10.0

Monetary Policy Rate and cash reserve requirement have negative relationship on inflation in Nigeria while liquidity ratio have positive relationships with lending rate in Nigeria. The observed coefficient of -2.168975, -0.004481 and 0.647175, show that unit increases in MPR, cash reserve requirement and liquidity ratio will respectively result in decreases of 2.168975 and 0.004481 and an increase of 0.647175 in inflation rate in Nigeria. MPR is seen to be a significant monetary policy variable for controlling of inflation rate. The R-squared and Adjusted R-squared values are 0.265882 and 0.177788 respectively; indicating that just about 27% of the variations in inflation rate can be explained by variations in the monetary policy variables. The Durbin Watson Test statistic (1.089124) falls in between the tabulated lower and upper limit (n = 29, k = 3) which are 0.988 and 1.418 respectively. Therefore, there is inconclusive evidence of positive autocorrelation.

Regression Output for Monetary Policies and Consumer Price Index

	Variable	Coefficient	Std. Error	t-Statistic	Prob.
	MPR	-4.567	1.157	-3.947	0.000
	CRR	-0.042	0.003	-12.852	0.000
	LQR	0.401	0.460	0.872	0.391
	C	126.809	20.938	6.056	0.000
R-squared	0.917	Mean dependent var			84.727
Adjusted R-squared	0.908	S.D. dependent var			71.988
S.E. of regression	21.826	Akaike info criterion			9.131
Sum squared resid	11909.89	Schwartz criterion			9.320
Log likelihood	-128.407	Hannan-Quinn criter			9.190
F-statistic	93.197	Durbin -Watson stat			1.032
Prob(F-statistic	0.000				

Source: Eviews 10.0

Monetary Policy Rate and cash reserve requirement have negative relationship with consumer price index while liquidity ratio have positive relationships with consumer price index. With a coefficient of -4.567548, -0.042571 and 0.401740, it follows that unit increases in MPR and cash reserve requirement will respectively result in a fall of 4.567548 and 0.042571 and an increase in the liquidity ratio would lead to a rise of 0.401740 in consumer price index in Nigeria. MPR and CRR are found to be a very significant monetary policy variable affecting the consumer price index. The R-squared and Adjusted R-squared values are 0.917923 and 0.908074 respectively; indicating that just about 92% of the variations in consumer price index can be explained by variations in the monetary policy variables. The Durbin Watson Test statistic (1.032951) falls in between the tabulated lower and upper limit (n = 29, k = 3) which are 0.988 and 1.418 respectively. Therefore, there is inconclusive evidence of positive autocorrelation.

Granger Causality on Monetary Policies and Macroeconomic variables
Pairwise Granger Causality Tests
Date: 10/09/19 Time: 05:15
Sample: 1980 2018
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
CRR does not Granger Cause LEND	27	0.16934	0.8453
LEND does not Granger Cause CRR		0.29777	0.7454
LR does not Granger Cause LEND	27	1.32040	0.2874
LEND does not Granger Cause LR		0.97379	0.3933
MPR does not Granger Cause LEND	27	1.02034	0.3769
LEND does not Granger Cause MPR		4.71589	0.0198
CRR does not Granger Cause PROD	27	2.06567	0.1506
PROD does not Granger Cause CRR		0.83978	0.4452
LR does not Granger Cause PROD	27	1.16696	0.3298
PROD does not Granger Cause LR		0.18261	0.8343
MPR does not Granger Cause PROD	27	0.65118	0.5312
PROD does not Granger Cause MPR		0.28046	0.7581
CRR does not Granger Cause INF	27	0.27708	0.7606
INF does not Granger Cause CRR		0.09082	0.9135
LR does not Granger Cause INF	27	0.71785	0.4989
INF does not Granger Cause LR		0.36154	0.7007
MPR does not Granger Cause INF	27	5.31675	0.0131
INF does not Granger Cause MPR		0.78721	0.4675

The granger causality result indicates that monetary policy does not granger cause macroeconomic variables. The p-value of the F-statistic is not significant at 5% level of significance. Invariably, monetary policy has no significant effect on macroeconomic variables in Nigeria.

VII. FINDINGS

The study examined the effect of monetary policy on selected macroeconomic variables which include; index of industrial production, lending rate and inflation rate. The findings of the study revealed that monetary variables (Monetary policy rate, cash reserve requirement and liquidity ratio) had a collectively significant impact on index of industrial production in Nigeria. Specifically, monetary policy rate, cash reserve requirement and liquidity ratio had positive relationships with index of industrial production. This finding is in line with the findings of Popkarn (2018) who found significant relationship between monetary policy variables and industrial growth. The positive relationship is also in line with the theoretical framework and a priori expectations of this study. These monetary policy variables have a direct impact on the desirability of funds used for

investment thus they affect the productivity of the industries in one way or the other.

The findings of the study also revealed that in line with economic theory and a priory expectation, monetary policy variables have a combined significant effect on lending rates in the Nigerian economy. This finding backs up the finding of Onyeiwu (2012) and Popkran (2018). Monetary policy rate was seen to have a positive and significant relationship with lending rate. Monetary policy rate is the prime lending rate in the Nigerian economy, therefore, other lending rates in Nigeria are bound to be significantly and positively determined by it. Cash reserve ratio and liquidity ratio was seen to have negative but insignificant relationship with lending rates in Nigeria. With more liquidity available to the bank interest rate drops as loans become cheaper to disburse due to the availability of funds.

As expected, monetary policy variables were found to have negative and significant effect on inflation rate in Nigeria. The only exception to this was in the case of liquidity ratio. These findings are in line with economic theory, more specifically, the monetary policy theory. It follows that the government uses tools such as monetary policy rate, cash reserve ratio and liquidity ratio to control inflation. As the findings also agree, when monetary policy rate is increased, it tends to pull down the demand and circulation of money in the economy; thereby reducing investments and demand for goods and services and ultimately inflation falls. On the other hand, when liquidity ratio is raised, loanable funds become cheaper and this increases the demand for money causing inflation to rise eventually.

VIII. CONCLUSIONS AND RECOMMENDATIONS

From the findings, monetary authorities often increase the requirements to reduce the amount of loanable funds available for loan. This would reduce the amount of money in circulation causing the demand for and prices of goods and services to drop significantly. In the case of liquidity ratio, monetary policy variables will not have negative and significant effect on inflation rate because when the liquidity ratio is raised, loanable funds become cheaper and this increases the demand for money causing inflation to rise eventually.

The government should use tools such as monetary policy rate, cash reserve ratio and liquidity ratio to control inflation and decrease monetary policy rate because it tends to increase the demand and circulation of money in the economy, thereby increasing investments and demands for goods and services. Monetary authorities should often increase the requirement to reduce the amount of loanable funds available for loans as this would reduce the amount of money in circulation.

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