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Appraisal of Monetary Policies on Commercial Bank Lending Behavior in Nigeria Banking Industry From 1980-2014

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APPRAISAL OF MONETARY POLICY ON COMMERCIAL BANK LENDING BEHAVIOR IN NIGERIA BANKING INDUSTRY FROM 1980-2014

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Olaoluwa F. Onaolapo^α & Shomade Habeeb G.^σ

Abstract- Various scholarly articles have focused on interest rate effect on bank lending rate but not many have seen monetary policy as a wholesome factor that determines bank lending behaviour. This study appraises the impact of monetary policy on commercial banks' lending behaviour in Nigeria. The Keynesian model which incorporated the role of money supply as a yardstick for interest rate to induce the public to hold additional money balances was adapted to investigate the link between monetary policies and commercial banks' lending rate in Nigeria. Annual time series data was sourced from the Central Bank of Nigeria's Statistical Bulletin between 1980 to 2014. Ordinary least square method (OLS), augmented dickey fuller test (ADF), co-integration test and Error correction model (ECM) were employed as estimation techniques. Pre-estimation findings showed that some variables were non-mean reverting at level and do not converge to their long run equilibrium until they were at first differenced. The empirical finding indicated that there was a long run relationship between monetary policy and commercial banks' lending behavior in Nigeria. It is recommended that Nigeria should consider policies beyond discretion, if monetary variables are to produce meaningful macroeconomic changes.

Keywords: *monetary policy, interest rate, exchange rate, reserve requirement, volume of deposits.*

I. INTRODUCTION

Several literatures have proven the causality of various monetary policy tools on bank lending rate. The impact of monetary policy on the economic growth of any nation cannot be under estimated. The conduct of the monetary policy in Nigeria and all activities of the Central Bank of Nigeria relate with the core mandate of the bank and therefore are best understood by this perspective (CBN, 2016).

The current review of the monetary policy in a means to meeting the lagging needs of the economy tends to have an effect on credit risk and social security. Monetary policy rate is the benchmark interest rate that determines all commercial bank's lending rate. Contractionary or expansionary monetary policy which ever that is necessary at a particular economic decision

making is exerted by the Government as a deliberate action to influence money supply. It is thus a discretionary control of money supply by the monetary authorities in order to achieve the desired economic goals.

Although, there exists numerous research on separate impact of exchange rate on banks credit openness, and interest rate on commercial bank lending rate in Nigeria, monetary policy and bank performance in Nigeria (for example, Ajayi, Felix O., Atanda, Akinwande A. 2012; Felicia Omowunmi Olokoyo, 2011, Jegede Charles Ayodele, 2014), this approach differs in terms of methodology and focus. Thus, this study on the Nigerian economy attempts to find out how several monetary variables influence the money supply in the economy. The specific objective of this study is to identify the channel through which monetary policy influences the performance of banking sector in Nigeria and to examine the monetary policy mix that promotes the performance of the banking sector in Nigeria. This paper is divided into six sections, section 2 review relevant literature while section 3 focuses on theoretical framework. Section 4 presents methodology and data, section 5 presents results while the sixth section recommends.

II. LITERATURE REVIEW

Monetary policy being a major economic stabilization weapon involves measures taken by the Central Bank to regulate and control the volume, cost, availability and direction of money and credit in an economy to achieve some specified macroeconomic policy objectives and to counter all undesirable trends in the economy. According to the United States Federal Reserve Board, (2006), monetary policy is the process by which the Government, Monetary Authority or Central Bank of a country controls the supply of money, availability of money and cost of money or interest rate to attain a set of objectives oriented towards the growth and stability of the economy. Monetary policy represents a combination of measures design to regulate and control volume of money and credits in order to achieve certain macroeconomic objectives.

CBN Annual Report (2004) defined monetary policy as a measure introduce by the monetary authority

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on monetary targeting and the mopping up of excess liquidity, aimed at ensuring a noninflationary macroeconomic environment. Similarly, CBN Annual Report (2009), refers to it as specific action taken by the Central Bank to regulate the value, supply and cost of money in the with a view to achieving Government's macroeconomic objectives. Specifically, the aims of monetary policy are basically to control inflation, maintain healthy balance of payments position in order to safe guard the external value of the national currency, and promote adequate and sustainable level of economic growth and development.

Lending is an act of temporary giving of money or property to another person with the expectation that it will be repaid.

Credit refers to the status of being trusted to pay money back to somebody who lends it to one (Oxford Advanced Learners Dictionary, 1998). It means a sum of money lent by a bank (Central Bank) to someone (Federal Government) who agrees to pay back with interest at a future date. Credit to the Federal Government enable it finance her budget deficits and carry out developmental projects in the country.

Nwankwo (2000) in Olokoyo (2011) argued that credit constitutes the largest single income-earning asset in the portfolio of most banks, thus explained why banks spend enormous resources to estimate, monitor and manage credit quality. This is understandably, a practice that impact greatly on the lending of banks as large resources are involved. Commercial banks perform three major functions, namely, acceptance of deposits, granting of loans, and the operation of the payment and settlement mechanism. In terms of flow of funds, the banking system, clearly dominates and has an important impact on the level of economic development. Adedoy in and Sobodun (1991) assert that "lending is undoubtedly the heart of banking business. Therefore, its administration requires considerable skill and dexterity on the part of the bank management".

Chizea (1994) asserted that "there are certain aspects of fiscal and monetary policies which could affect the decision of the discerning and informed public to patronize the bank and the lending behaviour of commercial banks. Paramount amongst these measures is what he called the interest rate disincentive. Interest rates have been so low in the country that they are negative in real terms". As inflation increased, the purchasing power of money lodged in deposit accounts reduce to the extent that savers per force pay an inflation tax. Commercial banks' lending in Nigeria is the restriction on the amount of interest they are allowed to pay on deposits in an effort to attract additional depositors and the interest they charge on their fund based activities" Usman (1999), commenting on the factors that affect commercial banks' lending behavior said that, "the sound and viable functioning of

commercial banks in Nigeria is adversely affected by the choice of certain policy instruments for the regulation of banking operations.

In Nigeria, however, the lending rate is rarely negotiated and, when it is reviewed upwards by the Central Bank of Nigeria (CBN), the average bank automatically applies the new rate to the outstanding loan without notifying the borrower (Ok a for, 2011). Ironically, the same bank hides the fact of any downward review of the lending rate from its mostly uninformed customer, thereby illegally subjecting the customer to a higher interest regime. Chodechai (2004) while investigating factors that affect interest rates, degree of lending volume and collateral setting in the loan decision of banks, says: "Banks have to be careful with their pricing decisions as regards to lending as banks cannot charge loan rates that are too low because the revenue from the interest income will not be enough to cover the cost of deposits, general expenses and the loss of revenue from some borrowers that do not pay". Moreover, charging too high loan rates may also create an adverse selection situation and moral hazard problems for the borrowers.

It is evident that the current recessionary effect of the Nigerian economy has forced the monetary authority to review the monetary policy. At first, there was confusion on the direction of the monetary tools, but since recession brings about unemployment and economic meltdown, there is a need to review upward the monetary policies such that money supply will be increased through bank lending capacity to increase industrialization and employment which tends to boost productivity.

III. THEORETICAL FRAMEWORK

This paper adopted the Keynesian Economists of monetary policy based on the fact that it works primarily through interest rate. In Keynesian transmission mechanism, an increase in the money supply leads to a fall in interest rate to include the public to hold additional money balances. Consequently, a fall in interest rate may stimulate investment. The increased investments also increase the level of income or output through the multiplier, which may stimulate economic activities.

Thus, monetary policy affects economic activity indirectly through their impact on interest rates and investment. This forms the monetary policy mix affecting decision making of banks. In simple terms, the monetary mechanism of Keynesians emphasizes the role of money, but involves an indirect linkage of money with aggregate demand via the interest rate as symbolically shown below: $\downarrow OMO \rightarrow \downarrow R \rightarrow \uparrow MS \rightarrow \downarrow r \rightarrow I \rightarrow \uparrow GNP$ Where, OMO = Open Market Operation R = Commercial Bank Reserve MS = Stock of Money r = Interest Rate I = Investment GNP = Gross National Product.

Meanwhile, Keynes asserts that Monetary affects real economy through the interest rate. Interest rate is determined by the supply and demand in the money market. Demand for money is not stable because of changing velocity of money. People do not spend and the velocity is low in depression and high in the boom.

Keynesian view of monetary policy is stated thus

$$\frac{M}{P} = kY - \eta \cdot r$$

Money supply is controlled by the policy maker

Interpretation: Increase in MS leads to lower interest rate and this reduces the cost of investment which boosts the investment income and thus higher aggregate demand.

Money Market Equilibrium:

$$r = \frac{1}{\eta} \left(kY - \frac{M}{P} \right) \tag{6}$$

Aggregate Demand Consistent with Goods and Money Market Equilibrium:

$$Y = \frac{a - bT + I_0 - q \left[\frac{1}{\eta} \left(kY - \frac{M}{P} \right) \right] + G}{1 - b} ; Y = \frac{a - bT + I_0 + \frac{q}{\eta} \frac{M}{P} + G}{1 - b + \frac{q}{\eta} k} \tag{7}$$

Equilibrium Interest Rate for Keynes is therefore given by:

$$r = \frac{k}{\eta} \left[\frac{a - bT + I_0 + \frac{q}{\eta} \frac{M}{P} + G}{1 - b + \frac{q}{\eta} k} - \frac{M}{P} \right]$$

IV. METHODOLOGY AND DATA

The model employed in this study is hereunder stated:

$$LOA = f (Vd, Fx, IR, GDP, Rr) \tag{1}$$

$$\text{Log LOA} = \beta_0 + \beta_1 \text{logVd} + \beta_2 \text{Fx} + \beta_3 \text{IR} + \beta_4 \text{logGDP} + \beta_5 \text{logRr} + \text{Ut} \tag{2}$$

Where $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$ and β_5 are parameters of the model, Volume of deposits Vd, Foreign Exchange, Fx, Interest Rate, Interest rate, IR, and Reserve Requirement RR. Ut is the error term.

But Basic structure for the Keynesian model of the monetary policy depicts that

$$\text{Consumption: } C = a + bY^d \tag{1}$$

$$\text{Disposable income: } Y^d = Y - T \tag{2}$$

$$\text{Investment: } I(r) = I_0 - q \cdot r \tag{3}$$

$$\text{Demand for real balances: } \frac{M}{P} = kY - \eta \cdot r \tag{4}$$

$$\text{National income identity: } Y = C + I + G \tag{5}$$

$$r = \frac{1}{\eta} \left(kY - \frac{M}{P} \right) \tag{6}$$

$$Y = \frac{a - bT + I_0 + \frac{q}{\eta} \frac{M}{P} + G}{1 - b + \frac{q}{\eta} k} \tag{7}$$

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a) *Estimation techniques*
This work used OLS multiple regressions analysis to determine the effect of the independent variable on the dependent variable. Although time series

data are used in many econometric studies, they present some special problems for econometricians.

Most of the empirical work based on time series data assumes that the underlying time series are stationary. In regressing a non-stationary time series variable on another, one often obtains a very high coefficient of determination (R^2) although there is no meaningful relationship between the two. This is the problem of spurious regression. This problem arises because if both the time series involved exhibit strong trends (sustained upward or downward movements), the high coefficient of determination (R^2) observed is due to the presence of the trend, and not because of a true relationship between the two variables. Any time series can be thought of as being generated by a stochastic or random process. A stochastic process is said to be stationary if its mean and variance are constant over time and the value of covariance between two time periods depends only on the distance or lag between two time periods and not on the actual time at which the covariance is computed. An alternative test of stationary that has become popular is known as unit root test.

This study would however utilize the Augmented Dickey Fuller (ADF) method to test for the stationarity of the variables. We went further by estimating the error correction model and the static model.

V. RESULTS PRESENTATION

It can be seen from the graph that the trend for loan and advances grew steadily over multiple periods before rising steadily until a significant increase was recorded between 2006 and 2014. Economic growth (GDP) declined sharply between 1981 and 1983 before recovering in 1984, and this recovery was sustained as consistent increase in economic performance was recorded thereafter. Exchange rate was steady in the early period which was largely due to the fixed exchange rate regime in place, but rose sharply in 1986 after the adoption of structural adjustment program (SAP), and the trend has been volatile thereafter with continuous increase in value. Interest rate on the other hand exhibited significant volatility over the study period, peaking and declining in multiple periods. Reserve requirement was stable over multiple periods until 1998 after the emergence of the democratic government and since then, consistent changes in volume has been recorded with significant surge in reserve requirement recorded between 2011 and 2014. Lastly, the volume of deposit experienced slight and steady increase in value until 1994 where slight increase was recorded. Since the emergence of the democratic era and especially 2004 when the commercial banks were consolidated, the trend of deposit increased steadily and significantly as more confidence in the banking system has been restored.

Table1: Descriptive Statistics

	LOGLOA	LOGVD	FX	IR	LOGGDP	LOGRR
Mean	5.576414	5.995982	65.92657	20.72200	10.17207	2.994680
Std. Dev.	2.740244	2.488789	63.76765	6.100340	0.494179	2.612581
Skewness	0.307498	0.102379	0.269755	0.065799	0.502269	0.196453
Kurtosis	1.727018	1.635792	1.268037	3.062297	1.952463	1.843611
Jarque-Bera	2.914777	2.775192	4.799035	0.030915	3.071878	2.175263
Probability	0.232844	0.249675	0.090762	0.984661	0.215253	0.337014
Observations	35	35	35	35	35	35

Source: Author's Computation (2016)

The statistical properties of the variables are highlighted here. The emphasis here is on the mean, standard deviation, Jarque-Bera and its Probability statistics for the variables involved in this study. The result showed that the mean for all the variables are positive. In the case of their skewness, all the variables are positively skewed. The skewness values of some of the variables are close to zero, while their mean values is far from zero. Hence, the variables are not standardized normal variables because they violated the properties of a standardized normal distribution. Regarding kurtosis that measures the peakness of the distribution of the variables, it can either be leptokurtic if its value is higher than 3, mesokurtic if equal to 3 and platykurtic if it less than 3. From the descriptive statistic table, the Kurtosis value for only one variable (IR) is

greater than 3 and thus we conclude that interest rate (IR) is leptokurtic, while the remaining three are platykurtic. Finally, the Jarque-Bera statistics and its probability value indicate the statistical significance of the variables. If the probability value is less than 5%, the variables are significant and vice versa. None of the variable has probability value that is less than 5% and thus failed to meet the criterion.

Table 2: Stationarity Test (ADF & PP)

ADF (Trend & Intercept)					
Variables	T-Stat @ Level	Critical Value	T-Stat @ First Difference	Critical Value	Order of Integration
LogLOA	0.8487	-3.63940	-4.8359*	-3.646342	I(1)
logVD	0.7143	-3.639407	-3.6854*	-3.646342	I(1)
FX	-0.1321	-3.639407	-5.4540*	-3.646342	I(1)
IR	-2.8041*	-3.639407			I(0)
logGDP	2.0395	-3.646342	-17.4919*	-3.646342	I(1)
RR	5.8458*	-3.699871			I(0)

*denotes significance at 1% level

PP (Trend & Intercept)					
Variables	T-Stat @ Level	Critical Value	T-Stat @ First Difference	Critical Value	Order of Integration
LogLOA	0.8487	-3.639407	-4.8359*	-3.646342	I(1)
logVD	0.4859	-3.639407	-3.6777*	-3.646342	I(1)
FX	-0.1459	-3.639407	-5.4540*	-3.646342	I(1)
IR	-2.6774*	-3.639407			I(0)
logGDP	0.1050	-3.639407	-14.8434*	-3.646342	I(1)
RR	11.3272*	-3.639407			I(0)

*denotes significance at 1% level

Source: Authors Computation (2016)

The result of the stationarity test as reported using Augmented Dickey Fuller test for stationary showed that four out of the six variables become stationary at First Difference, while the remaining two variables were stationary at Level. The result was obtained from the analysis of Augmented Dickey-Fuller (ADF) and Phillip Perron (PP), and it was observed that the computed Absolute T statistic value for only interest rate (IR) and Reserve Requirement (RR) were greater than the Mackinnon DF absolute critical value at 1%

critical value Level, while the remaining 4 variables only became stationary at First Difference under both the ADF and PP test. The overall view of this result is the rejection of the null hypothesis that log LOA, log VD, log GDP and FX are stationary. Because some of the variables were not stationary at Level, but became stationary at First difference, thus leaving us with series of I(0) and I(1) result, we proceed to test for the presence of co-integration among the variables using the Bound test for co-integration.

Table 3: ARDL Bound test for Cointegration

F-statistic	116.1871	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
s1%	3.41	4.68 (*)

Source: Authors Computation (2016)

The table above depicts the ARDL Bound test for Cointegration. The F-statistic valued as depicted in the diagram is compared to the upper (I1) and lower (I0) critical bound so as to determine the presence of co-integration among the variables. If the F-statistic is lower than the lower critical bound (I0), we can conclude that there exist no presence of co-integration among the variables. In the same vein, if the F-statistic value is greater than the upper critical bound (I1), we conclude that the variables

are co-integrated, and if the value falls between the lower (I0) and upper (I1) bound, the conclusion for co-integration is inconclusive, and we may have to consider alternative measures to determine the presence of co-integration. Our analysis showed that the F-statistic value is greater than the upper critical bound at all the upper bound critical values, and thus, we conclude that there exists a unique long run relationship among the variables.

Table 4: Error Correction Model

Dependent Variable: D(LOGLOA)				
Method: Least Squares				
Date: 11/17/16 Time: 13:32				
Sample (adjusted): 1983 2014				
Included observations: 32 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.143968	0.036195	3.977551	0.0006
D(LOGLOA(-2))	0.360992	0.108497	3.327212	0.0028
D(FX)	0.003087	0.001499	2.059112	0.0505
D(IR(-2))	0.010171	0.004391	2.316362	0.0294
D(LOGRR)	-0.160168	0.045681	-3.506240	0.0018
D(LOGRR(-1))	0.066971	0.043270	1.547721	0.1348
D(LOGRR(-2))	0.066039	0.040944	1.612896	0.1198
ECM1(-1)	-0.733396	0.091585	-8.007810	0.0000
R-squared	0.820245	Mean dependent var		0.241523
Adjusted R-squared	0.767817	S.D. dependent var		0.225967
S.E. of regression	0.108883	Akaike info criterion		-1.384764
Sum squared resid	0.284533	Schwarz criterion		-1.018330
Log likelihood	30.15623	Hannan-Quinn criter.		-1.263302
F-statistic	15.64502	Durbin-Watson stat		1.997215
Prob(F-statistic)	0.000000			

*, ** and *** denotes significance at 1%, 5% and 10% respectively.

The ECM measures the short run relationship between the variables, and reconciles them with the long run model. The error correction mechanism suggests that the speed of adjustment to the long run equilibrium is high. Specifically, the loan and advances disequilibrium suggests that the adjustment speed to the long run equilibrium is high, and that 73.34% of the disequilibrium errors which occurred the previous year are corrected in the current year. The major contributors to loan and advances in the short run are exchange rate and interest rate. Specifically, the result revealed that in the short run, the decision to increase exchange rate increases the proportion of loans and advances of the commercial banks. The rationale is that increasing exchange rate creates an avenue for commercial banks to convert their foreign asset to domestic currency at a higher rate which creates more liquidity for them and consequently increased loan and advances

disbursement. In the same vein, increase in interest rate contributed to increment in loan and advances. This finding is against the view that increasing interest rate reduces demand for loans and advances, but the argument behind it is that if investors believe the short term interest rate increase will translate into an increase in long term interest rate, they will decide to borrow for investment purposes now rather than wait for the long run when the interest rate is further increased as long as their exist a positive risk-return investment.

Table 5: Ordinary Least Square

Dependent Variable: LOGLOA				
Method: Least Squares				
Date: 11/17/16 Time: 13:22				
Sample (adjusted): 1981 2014				
Included observations: 34 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.644731	3.001730	-0.214786	0.8315
LOGLOA(-1)	0.569890	0.102058	5.583984	0.0000
LOGVD (*)	0.569822	0.089994	6.331752	0.0000
FX	0.000292	0.001474	0.197731	0.8447
IR (**)	-0.012574	0.005359	-2.346205	0.0266
LOGGDP	0.024121	0.329537	0.073197	0.9422
LOGRR (**)	-0.082432	0.039156	-2.105211	0.0447
R-squared	0.997430	Mean dependent var		5.680659
Adjusted R-squared	0.996859	S.D. dependent var		2.710094
S.E. of regression	0.151884	Akaike info criterion		-0.750156
Sum squared resid	0.622858	Schwarz criterion		-0.435905
Log likelihood	19.75265	Hannan-Quinn criter.		-0.642987
F-statistic	1746.582	Durbin-Watson stat		2.590346
Prob(F-statistic)	0.000000			

* and ** denotes significance at the 1% and 5% critical value respectively.

The Coefficient of Determination value of 99.74% indicated that about 99.74% variation in loan and advances (log LOA) is explained by variations in the explanatory variables, and that only 0.0026% variation in loan and advances is left unaccounted for by the model which is attributed to the error term. Similarly, the Adjusted Coefficient of Determination value of 99.69% means that 99.69% variation in the dependent variable is explained by variation in the explanatory variables. The F-statistic value which is greater than the 3.5 accompanied with its minimum probability value shows the significance of the model employed. Durbin Watson Statistics shows the absence of positive serial correlation.

The long run OLS model showed that the major determinants of loans and advances for the commercial banks are the volume of deposits, foreign exchange and economic growth. Specifically, the long run result showed that for every 1% increase in deposits, loan and advances from commercial banks increases significantly by 56.98% which is in line with our positive apriori expectation. The implication of this finding is that loan and advances is a major factor that determines the capacity of commercial banks in loan disbursement in Nigeria. In the same vein, exchange rate impacted minimally but positively on loan and advances from commercial banks. However, this positive contribution is insignificant. Economic growth as proxied by GDP also impacted positively but insignificantly on economic growth, and 1% increase in economic performance will

cause loan and advances to increase to the tune of 2.41%. It is the belief that an improving economy depicts allocation and utilization of resources that abounds in the economy, and thus the commercial banks tries to play its own role by disbursing loans and advances to sectors that holds potential to repay the principal and interest payment which thus translate into more growth of the economy. On the other hand, the result revealed that interest rate and reserve requirement both impacted negatively and significantly on loans and advances in the case of Nigeria. Monetary Policy authority uses these two tools as part of their operational targets tools and thus increasing level of interest rate and reserve requirement are often deployed to constrain the flow of cash in the economy which effectively reduces the ability of the commercial bank to create more money.

Specifically, increasing interest rate impede investors ability to investment in a cost covering projects and thus reduces the level of loans and advances disbursed by the commercial bank, while increasing reserve requirement also reduces the ability of the commercial bank to offer more loans to the society which automatically reduces the bank's loan and advances portfolio.

VI. CONCLUSION

Our results have clearly shown the effect of monetary policies on the rate at which banks lend to individuals and businesses both in the long run and short run. The lesson to be learnt is that the credit

openness of commercial banks depends on the economic stand at a particular point in time and should strive to create a conducive environment for sound macroeconomic decision making for a smooth working in the economy. This study, as one of the empirical investigations on the monetary policies impact on commercial bank lending behavior in Nigeria banking industry has provided a good understanding of the level of impact that money supply has on the growth of Nigeria's economy with particular reference to loans and advances by the commercial banks. The result arising from our findings indicates that bank lending behavior is determined by interest rate, exchange rate, deposit and reserve requirement for the period under review. It was also shown in the result that only interest rate and reserve requirement has a negative and significant impact on commercial bank lending rate while other variables have a positive relationship. The results of the study indicated that there is a long run relationship between deposits and commercial bank lending rate in Nigeria.

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