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The Impact of Macroeconomic Dynamic on Bank Lending Behavior in Nigeria

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Abstract: This study investigated the impact of macroeconomic dynamics on bank lending behavior in Nigeria between 1976 to 2016 using ordinary least square equation estimation, Johansen multivariate co integration and granger causality techniques. The findings of this study leads to various conclusive remarks. The result of the cointegration shows a long run equilibrium impact between macroeconomic variables and bank lending behavior in Nigeria. The OLS result reveals that bank capitalization ratio is the most important bank internal variables that explain their lending behavior given the vagaries of the macroeconomic environment in Nigeria while the money supply was found to be the most important macroeconomic variable that explains bank lending behavior in Nigeria. These variables (MOS & CAP) were found to be positive and significant at 5% level. Additionally, it was found that dynamics associated with monetary and macroeconomic variables (EXR, GDP, INF, MPR & LIQ) have a negative impact on bank lending behavior in the short run. The result of causality shows a unidirectional causality flowing from CPS to GDP, CPS to MPR and CPS to CAP in all cases excerpt for EXR to CPS. There is also evidence of bi-directional causality between CAP & EXR, CAP & GDP, LIQ & MPR and CAP & LIQ. From the findings of this study and the conclusion derived there from, we recommend that macroeconomic policy makers should adopt policy measures geared toward controlling the rising trend of inflation, exchange rate, and interest rate in Nigeria. While frantic effort should be made by the manager of the economy toward restoring the Nigeria economy to the path of sustainable and inclusive growth with the view of aborting the harmful effect of loan curtailment on investment and economic growth in the long-run.

Keywords: Macroeconomic Dynamic, Bank Lending, Behavior, OLS, Co integration, Pairwise Granger Causality.

1. Introduction

It Bank plays an important role in the economy by matching up lenders and borrowers in the financial market. By this role, bank acts as intermediary who channels financial wealth of the lender (surplus unit) to the borrower (deficit unit) who seeks loans to finance assorted expenditures, including productive and investment activities (Iwedi, 2016). This the banks do by ways of issuing of debts and loans to the creditors to capitalize their intermediation activities. These transactions of course pose great risk for the banks because of the likelihood that the creditors may default due to uncertain condition of the economy. This occurs when there are fluctuations in certain macroeconomic factors in the economy. Consequently, instability in these economic factors alters the lending behavior of financial institution in both short run and long run.

Whyte (2010) assert that the volume of credit extended by a bank is a function of its size, deposit base, liquidity, credit policy and other internal factors. These factors mostly fall within the control of the banks and this to a large extend are influenced by the general environmental factors such as the macroeconomic factors and banks regulatory factors. Similarly, Churchill (2014) document that a bank loan behavior is influenced by macroeconomic factors uncertainty prevalent in the economy. This uncertain nature of these factors and the general performance of the economy showed by macroeconomic aggregates such as inflation, money supply, industrial capacity utilization, employment level, exchange rate, interest rate and real GDP among others are determinant of the general loan behavior of a bank.

Typically, once a bank perceive the macro environment to be stable and they form expectations that borrowers will be better able to repay loans because of their improved ability to accurately predict income stream over the life span of the loan banks adjust their lending behavior in response to the signals from

these macroeconomic factors such that positive signals make banks lend more and vice versa. No wonder Talavera *et al.* (2006) concluded that banks make out more loans during periods of boom and reduced level of macroeconomic uncertainty and curtail lending when the economy is in recession.

However, in spite of the ongoing economic recovery, the macro environment in Nigeria remains in a period of significant uncertainty as the country continue to experience series of instability and volatility in macroeconomic factors. For instance, crude oil price in the international market decline from $50.3 per barrel in 2015Q1 to $30.16 in 2016Q1 and rose to $49.2per barrel in 2017Q1 while the economy (GDP) declined in real terms from3.96percent in 2015Q1 to -0.36percent in 2016Q1 and stood at -1.30percent in 2017Q1. There was an abysmal performance in the naira exchange rate to dollar such that the naira keeps depreciating that scholars called for devaluation of the naira. The naira exchange rate to dollar rose from #191.11/ $1in 2015Q1 to #197/ $1in 2016Q1. It rose astronomically to #305.64/ $1 in 2017Q1. Also the inflation rate was left behind as the rate rose from 8.5percent in 2015Q1to 12.8percent in 2016Q1 and later stood at 17.3percent in 2017Q1. The industrial and manufacturing capacity utilization rate decline from 60.50percent in 2015Q1 to 52.70percent in 2016Q1 further declined to 48.6percent in 2017Q (CBN, 2017).

Based on the relevance of this issue to policy, very limited studies of citable significance have dealt on macroeconomic dynamic and bank lending behavior in Nigeria (Olaniyan, 2000; Somoye and Ilo, 2009) as such this proposition remained relatively not well studied while the country is battling out of economic recession. It is therefore important that an empirical study of this nature be carried out with the view of understanding the general lending behavior of banks in the wake of volatile and unstable macro environment in Nigeria.

2. Literature Review

Previous studies have confirmed that banks react to macroeconomic uncertainty through loan allocation. As such, it is pertinent will review these works in the light of the present macroeconomic instability / volatility in Nigeria that have hamper lending activities of banks. The first work in this direction was the work of Beaudry *et al.* (2001) investigated the impact of aggregate price uncertainty on the time-variation in cross sectional distribution of investment at the aggregate and industry level using United Kingdom (UK) firm level data. They found that the cross-sectional distribution of investment narrows–implying more homogeneous investment behaviors across firms during times of uncertainty. Whereas, a reduction in inflation uncertainty leads to a widening dispersion as higher –quality information allows firms to invest in projects with deferring expected returns. Impliedly the study confirmed that inflation uncertainty hinders efficient allocation of resources.

Micco and Panizza (2004) tested how bank ownership affects bank lending behavior over the business cycle in developed and developing countries and measured lending behavior as the growth rate of loans by banks in each country. They found that loan growth is indeed correlated with macroeconomic shocks as measured by GDP growth. Specifically, a 1-percent increase (drop) in GDP is associated with a 1.46 per cent increase (drop) in lending by private domestic banks with a similar pattern exhibited by public banks. They also found that credit cyclicality is much lower in industrialized countries than in developing countries (the elasticity goes from 1.4 to 0.5) and that the lending activity of state-owned banks located in industrial countries seems to be counter-cyclical.

Nier and Zicchino (2005) concluded that in economic downturns bank experience losses. An increased incidence of loan-loss provision may eat into capital and result into bank capital requirements becoming binding in recessions. However, the cost of issuing new securities is high in time of recession as a result of more pronounced uncertainty about any banking firm and the economy as a whole. As a result when capital requirement becomes binding and banks are faced with the choice between issuing new capital and curtailing lending, banks may opt for the later.

Gambacorta and Iannotti (2005) studied the velocity and asymmetry in response of bank interest rates (lending, deposit, and inter-bank) to monetary policy shocks (changes) in Italy from 1985-2002 using an Asymmetric Vector Correction Model (AVECM) that allows for different behaviors in both the short-run and long-run .The study shows that the speed of adjustment of bank interest rate to monetary policy changes increased significantly after the introduction of the 1993 Banking Law, interest rate adjustment in response to positive and negative shocks are asymmetric in the short run , with the idea that in the long- run the equilibrium is unique. They also found that banks adjust their loan (deposit) prices at a faster rate during period of monetary tightening (easing).

Baum *et al.* (2005) investigated the relationship between macro-economic uncertainty and bank lending behavior of US banks using quarterly data from 1979 – 2003. They found that bank loans

constituted about 55% of bank total assets. Furthermore, using a GARCH model the study found that one-year cumulative effect of a 100 percent increase in uncertainty, captured by the conditional variance of industrial production (IP) and inflation leads to somewhere between a 9-11 per cent (5-7 %) reduction in the dispersion of bank loans-to-asset ratio for total loans, real estate loans and household loans. This finding supports the view that macroeconomic uncertainty distorts the efficient allocation of funds across potential borrowers.

Using the vector-autoregressive model Eickmeier *et al.* (2006) studied the relationship between bank lending behavior and economic uncertainty in Germany and the Euro Area. The real GDP, the price level, the short-term nominal interest rate and the stock of outstanding bank loans were used as proxy for economic uncertainty and Bank lending behavior. The results suggest that there is no evidence that loans amplify the transmission of macroeconomic fluctuations or that a "financial accelerator" via bank lending exists.

Talavera *et al.* (2006) studied the behavior of bank lending and macroeconomic uncertainty in Ukraine. Using consumer or producer inflation or changes in money supply (M1 and M2) and its component (demand and time deposit) as proxy for macroeconomic uncertainty, they found a negative relationship between bank loan to capital ratio and macroeconomic uncertainty. The result also reveals that banks increased their lending ratios when macroeconomic uncertainty decreases. However, the study found that the reaction of banks to changes in uncertainty is not uniform and depends on bank-specific characteristics, in particular, bank size and profitability.

Quagliariello (2009) using a portfolio model to examined the role that macroeconomic uncertainty plays in banks decisions regarding optimal asset allocation in Italy. The results confirmed that macroeconomic uncertainty is a significant determinant of banks‟ investment decisions, after controlling for bank specific factors such as nonperforming loans. Furthermore the results reveals that in periods of increasing turmoil, banks' ability to accurately forecast future returns is hindered and herding behavior tends to emerge, as witnessed by the reduction of the cross-sectional variance of the share of loans held in portfolio.

Whyte (2010) investigates the role that macroeconomic uncertainty plays in banking sector lending behavior in Jamaica using a portfolio model. The econometric results of the bounds cointegration testing procedure show that there is no long-run relationship between bank lending and the indicators of macroeconomic uncertainty. However, macroeconomic uncertainty does affect bank lending in the short-run. The coefficients are small but highly significant and the volatility of the benchmark interest rate, which is affected by fiscal and monetary policy, was found to be the most critical macroeconomic variable.

Churchill (2014) investigates the impact of macroeconomic instability on banking sector lending behavior in Ghana using data on commercial banks and macroeconomic instability from 1992 to 2009. The results under the Co-integration and Vector Error Correction Modeling framework show that bank lending has a long-run relationship with macroeconomic instability.

As it relates to the Nigerian economy, Olaniyan (2000) in his study of the effects of instability on aggregate investment in Nigeria showed that inflation and the variability of inflation rate are part of the important indicators of macroeconomic instability in Nigeria. The study showed that inflation has a negative and significant impact on investment in Nigeria. Also the works of Somoye and Ilo (2009) investigated the impact of macroeconomic instability on banking sector lending behavior in Nigeria using data on commercial banks and macroeconomic instability from 1986 to 2005. The study employed a co-integration and VECM framework to show that bank lending has a long-run relationship with macroeconomic instability. Using the money supply, exchange rate of the Naira to the US dollar, and the inflation rate as well as bank specific control variables, the authors set out to explore the dynamics of this relationship for the Nigerian economy. This study showed that while increases in broad money supply and inflation induced banks to curtail lending, exchange rate depreciation induced the industry to increase lending in the long-run. Additionally, the deposit mobilization capacity of banks and bank size were the most important bank characteristics that explained their lending behavior given the vagaries of the macroeconomic environment.

3. Methodology

3.1. Data Source

The data for the study are time series in nature. Time series data for all the listed commercial banks in Nigeria Stock Exchange and the corresponding macroeconomic variables for 1976-2016 were obtained from the publication of the central bank of Nigeria statistical bulletin and annual published financial

statement of banks as by Nigeria Stock Exchange fact book. Data obtained include figures on bank lending activities proxy by growth rate of net domestic credit to the economy, data on bank specific variables proxy by banks liquidity rate and banks capitalization rate while data on changes money supply growth, inflation rate, monetary policy rate, real gross domestic product and naira exchange rate to U.S dollar were used as proxy for macroeconomic dynamic/uncertainty.

3.2. Estimation Techniques

The data obtained were subjected to multivariate analysis. Both the descriptive and econometric tools were used in the analysis. The descriptive covers such as the Mean, Median, Standard Deviation, Skewness, kurtosis and JarqueBera statistic while econometrics includes the test of stationarity (Unit Root Test) using the Augmented Dickey Fuller (ADF) test which are conventional in most time series studies. The Ordinary Least Square (OLS) will test the nature of the impact and investigate the dynamic effects of macroeconomic dynamicon bank lending behavior and the co-integration test is used to establish if there is any long-run equilibrium impact between macroeconomic dynamic and bank lending behavior.

3.3. Model Specification

Following the framework developed by Beaudry *et al.* (2001) and employed by Baum *et al.* (2005), Somoye and Ilo (2009) and Whyte (2010) we assume that the macroeconomic dynamics and bank lending behavior in Nigeria can be modeled in the form of the following OLS framework:

$$BLB_t = f(LIQ_t, CAP_t, MOS_t, EXR_t, MPR_t, GDP_t, INF_t) \quad (1)$$

Equation 3 above will be rewritten to have the estimable version in equation 4.

$$BLB_t = \alpha_0 + \beta_1 LIQ_{t-1} + \beta_2 CAP_{t-2} + \beta_3 MOS_{t-3} + \beta_4 EXR_{t-4} + \beta_5 MPR_{t-5} + \beta_6 GDP_{t-6} + \beta_7 INF_{t-7} + \mu_{it} (2)$$

Where
BLB = Bank Lending Behavior
LIQ = Liquidity of Banks
CAP = Bank Capitalization Rate
MOS= Money Supply Growth
EXR = Naira Exchange Rate to U.S Dollar
MPR =Monetary Policy Rate
GDP = Gross Domestic Product
INF = Inflation Rate
$\alpha_0 = Constant$
$\beta_1 - \beta_8 = CoefficientsofIndependentVariables$
μ_{it} = Error Term

4. Results and Discussion

Table 4.1. Descriptive Statistics Results

	CPS	MOS	EXR	GDP	MPR	INF	CAP	LIQ
Mean	12.21220	18.02439	69.96683	7.443902	11.92220	19.88756	30.41220	46.73049
Median	10.70000	17.30000	21.88000	6.000000	12.67000	12.50000	34.30000	45.15000
Maximum	36.90000	46.10000	305.2200	36.80000	26.00000	113.0800	71.80000	65.10000
Minimum	2.400000	7.800000	0.550000	1.500000	3.500000	5.670000	2.000000	29.10000
Std. Dev.	6.560876	7.292523	77.24053	7.905668	4.682863	21.79006	21.89321	9.341687
Skewness	1.544078	1.935526	0.855556	2.273798	0.390535	2.438355	0.166902	0.256564
Kurtosis	7.090720	7.872080	3.040931	8.501940	3.540750	9.976410	2.061432	2.593747
Jarque-Bera	44.87911	66.15044	5.004698	87.04296	1.541736	123.7732	1.695238	0.731751
Probability	0.000000	0.000000	0.081892	0.000000	0.462611	0.000000	0.428434	0.693589
Observations	41	41	41	41	41	41	41	41

Source: E-view 9.0 Output

BLB = Bank Lending Behavior, **LIQ** = Liquidity of Banks, **CAP** = Bank Capitalization Rate, **MOS**= Money Supply Growth, **EXR** = Naira Exchange Rate to U.S Dollar, **MPR** = Monetary Policy Rate, **GDP** = Gross Domestic Product and **INF** = Inflation Rate.

Table 4.1 presents the result of the descriptive statistic. The skweness measure the asymmetry of the distribution of the series around its mean while kurtosis measures the normality of the series. For a distribution to be normal, it kurtosis most usually be peak at >3 and flat at < 3. In any case, if the kurtosis is >3, the distribution is known to be peak otherwise it will be flat < 3. For this study, all the variables under review demonstrates peak distribution excerpt for two internal variables (bank capitalization ratio and bank liquidity ratio) that demonstrate flat distribution. However, the Jarque-Bera tests whether the series (variables) are normally distributed and measures the difference between the skewness and kurtosis. As shown in table 4.1 the following series CPS, EXR, MOS, GDP and INF are normally distributed while MPR, CAP and LIQ are not.

Table 4.2. Unit Root Test for Interest Rate Channel Variable

	D(CPS)	D(MOS)	D(GDP)	D(INF)	D(MPR)	D(CAP)	D(LIQ)	2D(EXR)
ADF Statistics	-4.505911	-5.784735	-7.908659	-8.179032	-6.599848	-5.328397	-6.264825	-3.959294
1%	-4.2165	-3.6117	-3.6117	-3.6117	-3.6117	-3.6117	-3.6117	-3.6171
5%	-3.5312	-2.9399	-2.9399	-2.9399	-2.9399	-2.9399	-2.9399	-2.9422
Probability	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Source: E-view 9.0 Output

The ADF test results indicate that all the variables under study were stationary at first difference I (1) except EXR that stationary at second difference. In each case, the test statistic exceeded the critical value at 5 percent significance level.

Table 4.3. Cointegration Test

Date: 08/29/17 Time: 04:58				
Sample: 1976 2016				
Included observations: 39				
Series: CPS MOS EXR GDP MPR INF CAP LIQ				
Lags interval: 1 to 1				
	Likelihood	5 Percent	1 Percent	Hypothesized
Eigenvalue	Ratio	Critical Value	Critical Value	No. of CE(s)
0.810779	205.0649	156.00	168.36	None **
0.696751	140.1362	124.24	133.57	At most 1 **
0.647171	93.60136	94.15	103.18	At most 2
0.438191	52.97229	68.52	76.07	At most 3
0.295104	30.48513	47.21	54.46	At most 4
0.208077	16.84664	29.68	35.65	At most 5
0.142693	7.748279	15.41	20.04	At most 6
0.043729	1.743854	3.76	6.65	At most 7

*(**) denotes rejection of the hypothesis at 5% (1%) significance level
L.R. test indicates 2 cointegrating equation(s) at 5% significance level

Following the ADF test and since all the variables are I (1), the cointegration test is usually undertaken. The existence of co-integration implies that the variables share mutual stochastic trend and are linked in a common long run equilibrium relationship. For this study we employed the Johansen and Juselius (1990) approach of testing the number of cointegration vectors. From the Johansen and Juselius cointegration result, it was revealed that the null hypothesis of no cointegration is rejected in place of the alternative of the presence of cointegration. Evidently as shown in table 4.3 above, both the Likelihood Ratio and Eigenvalue test reject the null hypothesis of no cointegrating vector at 5% level of significance, but it indicates at most two cointegrating equation. Based on this evidence, we conclude that there exist a long run equilibrium impact between macroeconomic variables and bank lending attitude in Nigeria.

Table 4.4. Regression Analysis

Sample: 1976 2016				
Included observations: 41				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
MOS	0.817341	0.079121	10.33026	0.0000
EXR	-0.005356	0.009626	-0.556379	0.5816
GDP	-0.198210	0.093055	-2.130042	0.0405
INF	-0.012133	0.025233	-0.480852	0.6337
MPR	-0.092871	0.129061	-0.719588	0.4767
CAP	0.100403	0.035973	2.791093	0.0086
LIQ	-0.052127	0.041168	-1.266183	0.2141
R-squared	0.789104	Mean dependent var		12.21220
Adjusted R-squared	0.751887	S.D. dependent var		6.560876
S.E. of regression	3.268034	Akaike info criterion		5.360506
Sum squared resid	363.1216	Schwarz criterion		5.653067
Log likelihood	-102.8904	F-statistic		21.20282
Durbin-Watson stat	1.465666	Prob(F-statistic)		0.000000

Source: E-view 9.0 Output

BLB = Bank Lending Behavior, **LIQ** = Liquidity of Banks, **CAP** = Bank Capitalization Rate, **MOS**= Money Supply Growth, **EXR** = Naira Exchange Rate to U.S Dollar, **MPR** = Monetary Policy Rate, **GDP** = Gross Domestic Product and **INF** = Inflation Rate.

The OLS results in table 4.4 shows that their money supply dynamics and bank capitalization ratio were positive and significantly impacted on bank lending behavior in Nigeria. This is confirmed by their beta coefficient of 0.8173 and 0.1004 with a probability of 0.0000 and 0.0086 respectively. This implies that a 1% increase in these variables brings about 0.8173 and 0.1004 percent change in bank lending behavior in Nigeria. Evidently, it reveals that both variables were found to the most important bank characteristic and macroeconomic variable that explains the attitude of bank toward lending in Nigeria given the unstable nature of the macroeconomic environment. On the other hand, the dynamics of exchange rate, inflation, monetary policy rate, liquidity ratio and GDP have negative impact on bank lending behavior in Nigeria. This is confirmed by their coefficient and probability as follow: EXR (-0.005356 and 0.5816), GDP (-0.198210 and 0.0405), INF (-0.012133 and 0.6337), MPR (-0.092871 and 0.4767) and LIQ (-0.05213 and 0.2141). This inverse relationship between these macroeconomic variables and bank lending behavior was only significant with GDP while others were insignificant. This evidence suggests that 1% changes in these macroeconomic variables (EXR, GDP, INF, MPR, and LIQ) induced bank to curtail lending in Nigeria.

However, a look at the global statistic result shows that the coefficient of determination R^2 is 0.751887. This means that 75% of variation in bank lending behavior is explained by the dynamic nature of macroeconomic variables in Nigeria. This relationship is significant at 5% level since the F-statistic of 21.20282 falls outside the critical region of + (-) 0.0022.

Table 4.5. Pairwise Granger Causality Tests

Date: 08/29/17 Time: 05:33			
Sample: 1976 2016			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Probability
MOS does not Granger Cause CPS	39	0.71054	0.49853
CPS does not Granger Cause MOS	0.74720	0.48131	
EXR does not Granger Cause CPS	39	1.40634	0.25893
CPS does not Granger Cause EXR	0.40659	0.66911	
GDP does not Granger Cause CPS	39	0.01898	0.98121
CPS does not Granger Cause GDP	1.77049	0.18559	
INF does not Granger Cause CPS	39	0.13886	0.87084
CPS does not Granger Cause INF	0.51301	0.60325	
MPR does not Granger Cause CPS	39	0.61153	0.54838
CPS does not Granger Cause MPR	2.23055	0.12296	
CAP does not Granger Cause CPS	39	0.00701	0.99302
CPS does not Granger Cause CAP	2.21098	0.12511	
LIQ does not Granger Cause CPS	39	0.35659	0.70264

CPS does not Granger Cause LIQ	0.80227	0.45661	
EXR does not Granger Cause MOS	39	0.54588	0.58432
MOS does not Granger Cause EXR	0.78260	0.46528	
GDP does not Granger Cause MOS	39	0.16398	0.84943
MOS does not Granger Cause GDP	5.47297	0.00870	
INF does not Granger Cause MOS	39	0.79980	0.45769
MOS does not Granger Cause INF	0.97452	0.38767	
MPR does not Granger Cause MOS	39	0.84672	0.43766
MOS does not Granger Cause MPR	3.15718	0.05525	
CAP does not Granger Cause MOS	39	0.00928	0.99077
MOS does not Granger Cause CAP	1.13273	0.33401	
LIQ does not Granger Cause MOS	39	0.77938	0.46671
MOS does not Granger Cause LIQ	1.34035	0.27523	
GDP does not Granger Cause EXR	39	0.17004	0.84434
EXR does not Granger Cause GDP	0.44277	0.64591	
INF does not Granger Cause EXR	39	0.53234	0.59204
EXR does not Granger Cause INF	1.18994	0.31659	
MPR does not Granger Cause EXR	39	0.03818	0.96258
EXR does not Granger Cause MPR	0.23830	0.78927	
CAP does not Granger Cause EXR	39	1.71792	0.19465
EXR does not Granger Cause CAP	2.45361	0.10107	
LIQ does not Granger Cause EXR	39	0.17643	0.83902
EXR does not Granger Cause LIQ	0.47919	0.62341	
INF does not Granger Cause GDP	39	0.61854	0.54468
GDP does not Granger Cause INF	1.44371	0.25016	
MPR does not Granger Cause GDP	39	3.73933	0.03405
GDP does not Granger Cause MPR	0.89204	0.41919	
CAP does not Granger Cause GDP	39	3.18204	0.05410
GDP does not Granger Cause CAP	1.29951	0.28586	
LIQ does not Granger Cause GDP	39	0.52776	0.59468
GDP does not Granger Cause LIQ	0.93733	0.40156	
MPR does not Granger Cause INF	39	7.19955	0.00247
INF does not Granger Cause MPR	0.49497	0.61392	
CAP does not Granger Cause INF	39	0.17847	0.83733
INF does not Granger Cause CAP	0.03055	0.96994	
LIQ does not Granger Cause INF	39	0.36063	0.69987
INF does not Granger Cause LIQ	0.84671	0.43766	
CAP does not Granger Cause MPR	39	0.25456	0.77672
MPR does not Granger Cause CAP	0.09645	0.90830	
LIQ does not Granger Cause MPR	39	1.50167	0.23716
MPR does not Granger Cause LIQ	2.71682	0.08043	
LIQ does not Granger Cause CAP	39	2.29387	0.11628
CAP does not Granger Cause LIQ	3.12498	0.05677	

Source: E-view 9.0 Output

BLB = Bank Lending Behavior, **LIQ** = Liquidity of Banks, **CAP** = Bank Capitalization Rate, **MOS**= Money Supply Growth, **EXR** = Naira Exchange Rate to U.S Dollar, **MPR** = Monetary Policy Rate, **GDP** = Gross Domestic Product and **INF** = Inflation Rate.

Based on the pairwise granger causality test result in table 4.5 above, there are evidence of unidirectional causality between CPS and GDP, CPS and MPR, CPS and CAP and EXR and CPS with causality flowing from CPS in all cases except for EXR and CPS that causality runs from exchange rate to growth in credit to private sector. Similarly, we observe the case of a unidirectional causality running from MOS to GDP, MOS to MPR, MOS to CAP, MOS to LIQ, EXR to INF, GDP to INF, MPR to GDP and MPR to INF. This implies money aggregate grange cause other macroeconomic variables in Nigeria. On the other hand, the result also reveals the case of bidirectional causality between CAP and EXR, CAP and GDP, LIQ and MPR and CAP and LIQ, with the flow from both directions.

5. Conclusion and Recommendation

This study investigated the impact of macroeconomic dynamics on bank lending behavior in Nigeria between 1976 to 2016 using ordinary least square equation estimation, Johansen multivariate co integration and granger causality techniques. The findings of this study leads to various conclusive remarks. The result of the cointegration shows a long run equilibrium impact between macroeconomic variables and bank lending behavior in Nigeria. The OLS result reveals that bank capitalization ratio is the most important bank internal variables that explain their lending behavior given the vagaries of the macroeconomic environment in Nigeria while the money supply was found to be the most important macroeconomic variable that explains bank lending behavior in Nigeria. These variables (MOS & CAP) were found to be positive and significant at 5% level. Additionally, it was found that dynamics associated with monetary and macroeconomic variables (EXR, GDP, INF, MPR & LIQ) have a negative impact on bank lending behavior in the short run. The result of causality shows a unidirectional causality flowing from CPS to GDP, CPS to MPR and CPS to CAP in all cases excerpt for EXR to CPS. There is also evidence of bi-directional causality between CAP & EXR, CAP & GDP, LIQ & MPR and CAP & LIQ. From the findings of this study and the conclusion derived there from, we recommend that macroeconomic policy makers should adopt policy measures geared toward controlling the rising trend of inflation, exchange rate, and interest rate in Nigeria. While frantic effort should be made by the manager of the economy toward restoring the Nigeria economy to the path of sustainable and inclusive growth with the view of aborting the harmful effect of loan curtailment on investment and economic growth in the long-run.

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Appendix 1
Model Data for Analysis

Year	CPS	GDP	MPR	MOS	INF	EXR	LIQ	CAP
1976	7.8	21.0	3.50	19.3	12.1	0.63	59.1	2.0
1977	9.3	16.6	4.00	21.6	31.3	0.65	52.7	2.0
1978	11.4	9.3	5.00	21.3	6.2	0.61	38.4	2.0
1979	10.7	16.4	5.00	22.9	8.3	0.60	45.1	2.0
1980	19.8	36.8	6.00	46.1	12.42	0.55	47.6	2.0
1981	9.1	33.8	6.00	15.3	18.46	0.61	38.5	2.0
1982	10.6	3.0	8.00	16.6	4.83	0.67	40.5	2.0
1983	10.6	7.6	8.00	16.1	13.77	0.72	54.7	2.0
1984	10.7	10.9	10.00	17.3	13.27	0.76	65.1	44.3
1985	9.7	11.3	10.00	16.6	5.54	0.89	65.0	9.0
1986	11.3	1.89	10.00	17.7	11.63	2.02	36.4	3.9
1987	10.9	-0.7	12.75	14.3	67.40	4.01	46.5	4.0
1988	10.4	7.6	12.75	14.6	22.92	4.53	45.0	8.7
1989	8.0	7.2	18.50	12.0	45.04	7.39	40.3	36.0
1990	7.1	11.4	18.50	11.2	9.29	8.03	44.3	35.5
1991	7.6	0.01	14.50	13.8	17.60	9.9	38.6	36.3
1992	6.6	2.6	17.50	12.7	68.06	17.29	29.1	37.4
1993	11.7	1.6	26.00	15.2	26.13	22.05	42.2	34.3
1994	10.2	0.8	13.50	16.5	31.01	21.88	48.5	32.5
1995	6.2	2.2	13.50	9.9	113.08	21.88	33.1	32.7
1996	5.9	4.1	13.50	8.6	32.73	21.88	43.1	35.0
1997	7.5	2.9	13.50	9.9	1.01	21.88	40.2	32.5
1998	8.8	2.8	14.31	12.2	-5.67	21.88	46.8	35.7
1999	9.2	1.2	18.00	13.4	17.05	92.69	61.0	37.8
2000	7.9	4.9	13.50	13.1	35.23	102.1	64.1	35.9
2001	11.1	4.7	14.31	18.4	-0.32	111.94	52.9	32.5
2002	11.9	4.6	19.00	19.3	39.90	120.97	52.5	26.5
2003	11.1	9.6	15.00	19.7	11.14	129.35	50.9	21.3
2004	12.5	6.6	15.00	18.7	-0.16	133.5	50.2	23.1
2005	12.6	6.5	13.00	18.7	22.02	132.14	50.2	39.3
2006	12.3	6.0	12.25	20.2	17.34	128.65	55.7	42.7
2007	17.8	6.5	8.75	24.8	4.77	125.83	48.8	65.6
2008	28.6	6.0	9.81	33.0	11.6	134.33	44.3	51.5
2009	36.9	7.0	7.44	38.0	12.5	150.40	30.7	53.3
2010	18.6	8.0	6.13	20.2	13.7	152.63	30.4	7.9
2011	16.9	5.3	9.19	19.3	10.8	162.17	42.0	44.7
2012	20.4	4.2	12.00	19.4	12.2	158.84	49.7	71.8
2013	19.7	5.5	12.20	18.9	8.5	159.25	63.2	71.6
2014	19.2	6.2	12.25	19.9	8.0	180.33	41.1	65.5
2015	14.5	2.8	12.67	14.5	9.0	196.99	42.3	66.8
2016	-2.4	-1.5	14.00	7.8	15.7	305.22	45.15	55.3

Source: CBN (2016)