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Investigating the Factors Influencing Commercial Bank Lending in Nigeria: A Consolidation and Interaction Effect

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Abstract:

This study provides empirical evidence on what determines bank lending in Nigeria by considering the pre and post consolidation effect and interaction effect using annual data from 1990-2019. This study employs multiple regression analysis. The regression model examines the effect of total savings (TOS), non- performing loan rate (NPLR) and number of bank branches (NBB) on credit to private sector (CPS). The study also investigates the interaction effect of total savings and Number of bank branches in explaining the combined factors that influences Nigerian Commercial Banks' lending. The regression results reveal that before and after structural break, none of the variables is significant to determine commercial bank lending in Nigeria. It also reveals that prior to consolidation only TOS and NPLR had positive effect on CPS while all the variables had negative effects on CPS after consolidation period. From the result of the interaction effect, it's evident that the direct effect of total savings and Nonperforming loan exact significant effects. The interaction effect of total savings and Number of bank branches of bank branches shows a negative but significant relationship with credit to private sector.

This study therefore concludes that there exists an interaction effect in the model and that none of the variables is significant in determining commercial bank lending in Nigeria before and after consolidation. However, the multiplicative effect of total savings and number of branches on commercial bank lending behavior is significant. Therefore, the study recommends that total savings, non-performing loans and Number of bank branches should be jointly managed and utilized to control bank lending behavior in Nigeria.

Keywords: Commercial bank lending, consolidation effect, interaction effect, Nigeria

1. Introduction

Financial Sector is the life wire that ensures sustainable development of every economy as evident by the support system they render in any economy. Over the years, banks as a financial institution have concentrated on the responsibility of bridging the gap between the surplus unit and deficit unit through bank lending which has made the sector indispensable. The works of Alhassan and Asaman (2013) confirmed that Commercial banks in Nigeria are efficient in allocating, mobilizing, and saving funds. Contrarily, the views of Oyebowale (2020), Lucas (1988) and Robinson (1952) accentuates that the financial institution has been passive in stimulating sustainable development in the economy due to loss of confidence in the seekers of fund and many other factors. However, the relevance of banking to other sectors cannot be undermined

One of the channels banks stimulate productive activities in the economy is through bank lending which could be long term, intermediate or short term in nature. They achieve this by bringing the savings unit and deficit unit together and granting credits to productive sectors in any economy such as corporate businesses, private individuals and government parastatals. The profits from the various investments of these sectors are sometimes ploughed back into the economy which in turn aid development. It's worth noting that, several factors have been investigated to be determinants of bank lending. These include: type of bank, bank size and deposit, loan mix/loan portfolio, total savings, number of bank branches etc. However, despite these findings, banks have lost confidence in granting of loans as a result of excessive defaults and there has been no desirable improvement in bank lending to the productive sectors (Yakubu, Omosola and Obiezue, 2018). This is associated to the poor banking environment and noticeable increase in the risk of delivering loans to the informal and real sector.

In order to ensure that the capacity and willingness of banks in lending is boosted and avoid the sudden liquidation of banks, the Nigerian deposit money banks were restructured. The restructuring commenced 2005, when Governor Soludo introduced the need for recapitalization into the sector through consolidation. (BIS, 2001) viewed consolidation as the increase in the size and improvement in the rendering of financial services occasioned by decrease in

the number of banks. This exercise was supposed to primarily boost public's confidence in the financial institutions which will have a spillover effect on the whole economy in the long run. Ogowewo and Uche (2006) added that consolidation would be a cushion for banks against risk taking as a result of capital adequacy and increase in size. It worth noting that, prior consolidation, deposit money banks in Nigeria were small in sizes and incur heavy operating expenses through expensive investment in establishing unhealthy branches where there is less patronage. These and lots more increased the price of intermediation accompanied by engagement in sharp practices for survival. Adegbagu and Olokoyo (2008), opined further that bank consolidation may strengthen the financial system by making the weak and poor banks more efficient in rendering financial services, improving profitability and in the long run encourage the lending behavior of Nigerian Banks

Commercial banks from time immemorial experienced frequent liquidity challenges that has consequently denied the informal sector and the real sector the required financial resources to occasion growth in the sector especially with the usual rejection of long-term finance that the real sector and the informal sector deserves to improve productivity and in effect economic growth (Yakubu*et al* 2018; Moussa andChedia, 2016). Also, the continued preference for assets with a safe and fixed income by banks instead of lending to the real sector directly has continued to reduce the amount of bank credit in the economy. In the past, studies conducted on this issue particularly focused on empirical analysis of determinants of banks' lending behavior with high concentration on individual effects of bank specific variables as well as economic variables. To the best of our knowledge, there is paucity of work on the interaction of variables that could determine Bank lending in Nigeria.

Therefore, this study tends to significantly assess this issue and contribute to the existing body of literature by discovering factors that determine lending behavior of Banks considering the interaction effect of these variables and their reactions to the consolidation effect Policy of year 2005. The next section of the paper reviews literature follows by the methods of analysis. The penultimate section is devoted to analysis and discussion of the results while the final section concludes and gives recommendations.

2. Literature Review

Prior to the consolidation era which commenced in 2005, the number of banking institutions in Nigeria were eighty-nine (89) but reduced to 21 stronger banks through the recapitalization process that led to consolidation of banks in form ofMerger and Acquisitions. However, despite this process, some banks still find it cumbersome to administer loan that tends to foster a sustainable development in the Nigerian Economy. Therefore, in a bid to determine the factors that could encourage bank lending, several empirical studies have been conducted.

For instance, Oyebowale (2020) provides evidence on the variables that determines bank lending in Nigeria between 1961 and 2016 by using ARDL bound test and granger causality test. The results of Granger causality revealed that growth in loan-to-deposit ratio and inflation are caused by increase in rateof bank lending while only broad money determines bank lending in Nigeria. In United Kingdom context, Fatouh, Markose andGiansante (2019) examined the effect of quantitative easy on bank lending in UK. Their findings explained that combining lower bond yields and capital requirements of Basel on banks, causes a decline in the rate of bank loans to businesses.

Also in Nigeria context, Ebire and Ogunyinka (2018) examined the factors that determine demand and supply of bank loans in Nigeria between 2002 and 2017. The result shows that on the supply side only borrowing rate and lending rate prove significant on bank loan with positive and negative effect respectively while GDP and inflation exert positive and negative impact on bank loan, respectively on the demand side. Akani and Oparaordu (2018) employed bank specific and economic variables to examine the determinants of commercial banks credit to the domestic economy in Nigeria by using granger causality test and vector error correction model for the purpose of analysis. The study revealed that of all the variables used only deposit rate, number of commercial banks branches, openness of the economy; financial sector development and monetary policy, public expenditure and openness of the economy have negative impact on total commercial bank loans and advances. The study of Matousek and Solomon (2018) on the channel of bank lending of 23 banks in Nigeria between 2002 and 2008 reveals that the significant determinants of lending are capitalization, liquidity, and bank size. The findings of Olaoluwa and Shomade (2017) investigated how monetary policies affect bank lending in Nigeria between 1980 and 2014. Volume of deposits, foreign exchange, reserve requirement, interest rate, and GDP were the independent variables while loans and advances was used as proxy for bank lending. The study reveals that there exists a statistically significant relationship between exchange rate, interest rate, volume of deposits, reserve requirements and commercial banks' lending in Nigeria. In Jordan, Alkhazaleh (2017) shed more light into factors determining bank lending from 2010 to2016. The study employed an ordinary least square model and confirmed that credit risk and liquidity had adverse effect while other macroeconomic variables such as gross domestic product growth rate, money supply and inflation had significantly positive effect on bank lending. It discovered further that volume of deposits and investments have significant impact on bank lending in Jordan.

In addition to this ongoing debate, Lucky and Lyndon (2016) looked into the impact of interest rate and economic growth on commercial bank lending in Nigeria between 1985 and 2014. By using, Ordinary Least Square technique, the result showed that interest rate and economic growth had negative and positive relationship with bank lending respectively.Lydnon, Peter andEbitare (2016), also investigated the influence of non-performing loans on bank performance in Nigeria from 1994 to 2014. The result of the model employed showed bad loans, doubtful loans and Substandard loans had negative influence on Return on capital employed. However, only bad loans and doubtful loans exert a statistically significant impact. To confirm the works of Lydnon, Peter and Ebitare (2016), Alalade, Adewunmi and Oladimeji (2016) studied the effect of non-performing loan on the financial performance of deposit money banks from

2009 to 2013. It was also discovered that there is a negative but significant relationship between Provision for Loan Loss and Non-performing loan ratio with financial performance of the 15 Nigerian Banks under study.

In other to concentrate on post consolidation era, Akinyomi (2014) examined the impact of volume deposit money on lending behaviour of Nigerian banks between 2006 and 2012. The study adopted the correlation research design. The author discovered that relationship between volume of deposit and bank lending is positive. This implies that an increase in the volume of deposit money held by banks would cause a simultaneous increase in level of loans and advances made available to the deficit units. For the purpose of a dynamic comparison, Anthonia (2014), examined pre consolidation and post consolidation of Nigeria banking sector which covered the period of 1999-2004 for the pre consolidation era and 2005-2011 for the post consolidation era, variables used are profit after tax, dividend per share, earnings per share and loans and advances. Generalized Method of Moments employed, revealed that banking consolidation could have negative impact on the gradual stability of the banking sector.

In the context of Ethiopia, Malede (2014), examined the commercial banks' Lending determinants in Ethiopia from 2005 to 2011 by employing ordinary least square. The result showed that there exists a significantly positive relationship between lending rate, GDP, credit risk, liquidity and bank size with commercial banks' lending while deposit and cash reserve required exert an insignificant impact. Tomak (2013) studies the determinant of bank lending in Turkey between 2003 and 2012 with case study of 18 banks. The results revealed that inflation rate, total liabilities of banks and non-performing loan rate were significant. Also, the study on the factors that influences bank lending decisions of commercial banks in Nigeria was investigated by Olokoyo (2011) between 1980 and 2005. The results revealed thatcash reserve ratio, liquidity ratio and interest rate have an insignificant effect on Nigerian banks' lending behavior. However, there is a statistical significant impact of investment portfolio, volume of deposits, foreign exchange and GDP on commercial banks total credit facilities.

3. Research Methods

3.1. Model Specification and Data Analysis

The model specified for this study covers the objectives of this study. It includes the relationship among the variables considering consolidation effect and joint effect of the independent variables on the dependent variable. Thus, the model is specified as follows:

It can also be specified as below:

To examine whether a simultaneous increase in total savings and number of bank branches matter in determining credit to private sectors, a multiplicative term of total savings and number of bank branches on credit to private sectors is specified in equation (3.3) below:

Following the above specification in equation (3.3), the model can be further expressed as below:

From equation (3.4), β_1 and β_2 respectively measure the direct impact of TOS and NBB while β_3 examines the interaction effect of both TOS and NBB on CPS. Therefore, partially differentiating equation (3.4) with respect to TOS and NBB are as follow:

$$\frac{\partial CPS}{\partial TOS} = \beta_1 + \beta_3 NBB \dots \dots \dots 3.5 \qquad Marginal effect on CPS with respect to TOS \\ \frac{\partial CPS}{\partial NBB} = \beta_2 + \beta_3 TOS \dots \dots 3.6 \qquad Marginal effect on CPS with respect to NBB$$

Where:

Y = Credit to private sectors (CPS)X = Total Savings (TOS)

$$X_1 = Total Savings (TOS)$$

 $X_2 = Number of Bank branches (NBB)$

$$X_3 = Non - performing \ loan \ rate \ (NPLR)$$

 $\partial X_{1,} \partial X_{2}, \partial X_{3} = Reactions of TOS$, NBB & NPLR to consolidation effect respectively.

 $\beta_3 X_1 X_2$ = Joint effect of total savings and Number of Bank Branches on CPS

To analyze the specified model, Regression analysis (OLS) was employed on 1990 to 2019 secondary data sourced from the CBN statistical Bulletin. It is expected that there exists a positive relationship among credit to private sectors, Total savings and number of bank branches prior and after consolidation. This is assumed because when the savings of banks with the number of bank increases, loan facilities to private sectors would increase. In the same vein, the joint effect of total savings and number of Bank branches on credit to private sectors is assumed to be positive and significant. Also,

the relationship between non-performing loan rate and credit to private sectors is expected to be negative. This implies that a rise in the rate of non-performing loans would discourage banks from lending to the private sector

Variable	Mean	Max	Min	std. Dev.	Skewness	Kurtosis	Jaquebera (prob)
CPS	10.08	19.63	4.96	3.58	0.98	3.59	5.24(0.07)
TOS	4327.15	17040	29.65	5339	0.99	2.59	5.13(0.07)
NPLR	15.99	37.3	2.96	7.7	0.13	3.41	0.29(0.86)
NBB	4049	8001	1939	1892	0.56	1.97	2.90(0.23)
Dummy	0.5	1	0	0.5	0	1	5.00(0.08)
NPLRE	6.4	37.3	0	9.28	1.62	5.23	19.3(0.00)
NBBE	2827	8001	0	3015	0.26	1.37	3.63(0.16)

4. Results and Discussion

Table 1: Descriptive Analysis

Table 1, describes the properties of the data on variables used for the analysis. The mean value of all the variables falls within the maximum and minimum values which imply data consistency. From the mean result, TOS with its reaction (TOSE) has the highest value of 4327.15 (4189.3) followed by NBB with its reaction (NBBE) with values 4049.90 and 2827 respectively. This reveals the magnitude of the size of both variables during the period.

The descriptive result also reveals that apart from the dummy, TOS and TOSE are the variables with the most significant fluctuation with a standard deviation of 5359.05 and 5464. This implies that the size of total savings is not regular but possesses some fluctuation levels. It's also revealing from the skewness result that, all the variables are long left tailed with values less than zero. This implies that they are negatively skewed. However, only NPLRE (Reactions of non-performing loan to consolidation effect) is positively skewed with value greater than zero (1.62). The distribution of CPS, NPLR and NPLRE are leptokurtic. This implies that all other variables have a flat curve except CPS NPLRE with a peak curve. The Probability of JarqueBera shows that only NPLR, NBB and NBBE are normally distributed since they are not statistically significant at 5% significance level.

Regressor	Coefficient	Probability Value
Total Savings (TOS)	0.0036	0.489
NPLR	0.1553	0.5367
NBB	-0.0007	0.763
Dummy	30.9991	0.0340*
TOSE	-0.0017	0.7359
NPLRE	-0.0719	0.7814
NBBE	-0.0063	0.1417
$R^2 = 0.6724$		0.000333
Prob(F-statistic)		

Table 2: Determinant of Commercial Bank Lending Rate in Nigeria: A Consolidation Effect.Dependent Variable: Credit to Private Sector

Table 2 reveals the determinants of commercial bank lending rate in Nigeria prior and after consolidation by including dummy variables of 0 for periods from 1990 – 2004and 1 for periods from 2005 – 2019 since the consolidation policy came to lime light in 2005. The results show that before the consolidation policy in 2005, total savings and non-performing loan rate had positive effect on credit to private sectors while Number of bank Branches had negative impact on credit to private sectors. Also, after consolidation, the result established that the reactions of the independent variables show a negative relationship with credit to private sectors. The result also shows that before and after consolidation none of these variables prove significant while the result of the Prob (F-statistic) of 0.00033 shows that the model is statistically significant at 1% significant level. The R^2 also shows that the independent variables are fit to explain 67.2% variations in the dependent variables while

Regressors	Coefficient	Probabilty Value
Total Savings	0.00302	0.0006*
Number of Bank Branches	0.0006	0.5294

Non-performing Loan rate	0.1569	0.0094*
Total savings * Number of Bank	-3.92	0.0000*
Branches		
Constant	-2.6407	0.3161
$R^2 = 0.7209$		
Prob(F-statistic)		0.00001

Table 3: An Interaction Effect of Total Savings and Number of Bank B Ranches on Credit to Private Sectors In Nigeria Dependent Variable: Credit to Private Sectors

Table 3 reveals that the direct effect of total savings, Number of bank Branches and Non- performing loan on credit to private sectors is positive while only total savings and Nonperforming loan exact significant effects. The marginal effect of increasing total savings for a corresponding change in CPS depends on the slope coefficient of 0.00302(Total savings) and -3.92 (interaction effect with Number of Bank Branches). Also, the marginal effect of increasing Number of bank branches for a corresponding change in credit to private sectors depends on the slope coefficient of NBB (0.00060) and interactive effect of -3.92 with TOS.

The result also reveals that a change in joint effect of the variables (TOS and NBB) will lead to a reduction of 3.92 in rates of lending to private sectors. It's also evident from the result that there exists a significant and stronger interaction effect of Total savings and Number of bank branches on credits to private sectors. The R^2 also shows that the independent variables are fit to explain 72% variations in the dependent variables while the result of the F-statistic of 0.00001 shows that the model is statistically significant at 1% significant level.

4. Implication of Findings

The findings on the consolidation effect reveals that before consolidation only number of bank branches exert a negative effect on CPS and confirmed in the works of Akani&Oparaordu (2018) while all the variables had a negative effect on CPS after consolidation with insignificant impact in both periods. This is not in line with the *apriori* expectation. The implication is that regardless of the relationships, Total savings, nonperforming loan rate and number of bank Branches are not significant in determining commercial bank lending in Nigeria.

From the interaction effect, the direct relationship of Total Savings, Number of bank Branches and Nonperforming loan with credit to private sectors show positive relationships. This implies that growth in the number of bank branches, Total Savings and Nonperforming loan will increase the capacity and willingness of deposit money banks to perform their financial intermediation role between the surplus and deficit unit in Nigerian Economy. This is in consonance with the works of Malede (2014). However, with respect to the positive relationship between Nonperforming loan and lending to private sectors, it's controversial and not in consonance with the *apriori* expectation but supported by the works of Tomak (2013). It's assumed that most savers neglect the information on the nonperforming loans profile of financial institutions before saving their funds. This in turn, boosts the availability of funds in these banks and the capacity to give out more loans.The result also reveals that multiplicative or interactive effect of Total Savings and Number of bank branches in determining commercial bank lending is significant.

5. Conclusion and Recommendations

The study investigates the determinants of commercial bank lending behaviour in Nigeria considering the consolidation effect and interaction effect. Prior consolidation, the findings showed that total savings and Nonperforming loan rate have positive effect on credit to private sectors while after consolidation, all the independent variables had negative effect on credit to private sectors. Moreover, none of the variables is significant both in the pre and post consolidation era. On the interaction effect side, all the variables have a direct relationship with the dependent variable while only Total savings and Nonperforming proved significant. Furthermore, the interaction effect of total savings and number of bank branches is significant.

This study therefore, concludes that there exists an interaction effect in the model and that none of the variables is significant in determining commercial bank lending in Nigeria before and after consolidation. However, the multiplicative effect of total savings and number of branches on commercial bank lending behavior is significant. Therefore, the study recommends that total savings, non-performing loans and Number of bank branches should be jointly managed and utilized to control bank lending behavior in Nigeria.

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