



Credit Risk Management on Incidence of Bad Loans of Quoted Commercial Banks in Nigeria

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ABSTRACT

This study examined the effect of credit risk management on incidence of bad loans of quoted commercial banks in Nigeria. Cross sectional data was sourced from financial statement of commercial banks and Central Bank of Nigeria Statistical bulletin from 2012-2021. Bad loans were modeled as the function of credit selection, Credit diversification, Credit valuation and Loan loss provision. Panel data methodology was employed while the fixed effects model was used as estimation technique at 5% level of significance. Fixed effects, random effects and pooled estimates were tested while the Hausman test was used to determine the best fit. Furthermore, the regression coefficient proved that credit selection, credit limit, credit diversification has positive effect on bad loans while credit limit, loans loss provision and credit evaluation have positive effect on the dependent variable. From the findings, the study concludes that credit risk management has significant relationship with incidence of bad loans in Nigeria commercial banks. We recommend that risk management should be diversified across different sectors and products have beneficial effects on the credit risk management. Commercial banks in Nigeria should put a heavier emphasis on risk diversification and credit worthiness analysis, credit score analysis and internal ratings in their credit risk management practices.

Keywords: Credit Risk Management, Bad Loans, Commercial Banks, Nigeria

INTRODUCTION

The application of management concept in piloting the affairs of organizations helps in guiding explaining, predicting and influencing the organizational behaviours. These behaviours may be in form of human or material and in either form, the goals and objectives of the organization are affected. It therefore behoves on any organization whether public or private to apply the concept of management in its operations (Tetteh, 2012). Bank management is the deliberate and concerted efforts of a bank to plan organize, direct, control, and coordinate the resources of banks' with a view to ensuring a healthy balance sheet. From this definition, it means that the balance sheet of a bank sheet should be a measure for ascertaining the realization of the banks' goals and objectives. It depicts whether a bank is performing well or not especially when one item (in the balance sheet) is related to the other.

However, banks exists not only to accept deposits but also to grant credit facilities, therefore inevitably exposed to risk of credit management. Credit plays a very vital part in the economic growth and development of a country. These roles credit plays can be categorized into two: it enables the transfer of funds to where it will be most effectively and efficiently used and secondly, credit economizes the use of currency or coin money as granting of credit has a multiplier effect on the volume of currency or coin in circulation. Credit creation is the prime operation of banks but exposes to credit risks for the banks due to failure of the borrowers to fulfill the commitment with banks. The extent to which deposit money banks

extend credit to the public for productive activities accelerates the pace of a nation's economic growth and its long-run sustainability (Marsh, 2008). The credit transformation function of banks enhances the ability of investors to exploit desired profitable ventures. Credit creation is the main income generating activity of banks (Kargi, 2011). It exposes banks to credit risk and therefore does not only affect profitability of banks but can lead to insolvency, liquidation and bank distress if poorly managed (Lucky and Nwosi, 2015).

Historically, the incidence of banking sector failure, resulting from insolvency has often been associated with massive accumulation of non-performing loans (Fofack, 2005). Over the years, the Nigerian banking system has transformed in ownership structure, size and operational coverage. Prior to 2005 banking system consolidation in Nigeria, eighty-nine (89) banks existed under a universal banking system (UBS) a framework that placed no restrictions on banks' share capital investments in other financial service sectors. The UBS led to the proliferation of other financial institutions having banks as minority or majority shareholders and created supervisory bottlenecks for the regulating institution, due to subsidiaries' interconnectedness. Despite these investments, and considering the population of Nigeria, huge capital market and the overall economic activities, the banking system was rated very marginally, relative to its potential (CBN, 2009); hence, the banking system consolidation in 2005. The effect of the consolidation exercise was felt almost immediately, as there was a huge decline in non-performing loans, from 21.6 per cent in 2005 to 9.3 per cent in 2006. Similarly, return on assets declined from 2.1 per cent in 2005 to 1.8 per cent in 2006, although it rose moderately to 3.0 per cent in 2007.

The advent of the 2007/2008 Global Financial Crisis (GFC) gave rise to the decline in oil price, with significantly dampened returns on investment in the oil sector. The attendant capital outflow exposed the banking system to a high credit risk position. The asset quality of Nigerian banks decreased significantly, as non-performing loans skyrocketed with adverse economic consequences. The lingering effect of the GFC worsened the situation, raising the non-performing loan (NPL) ratio of the banks to an all-time high of 37.3 per cent in 2009. The banks were choked with toxic assets and faced serious liquidity challenges that impaired their ability to extend credit to the real sector. Many of the banks had to downsize and tighten expenditure to scale through the challenges. Credit is the faith lender has in a borrower so that resources can be transferred to the borrower without immediate payment (Greuning & Bratanovic, 2013). This means the lender gives a borrower an asset with the intention of getting an equal asset in value on the day of payment in a later date. Credit risk is by far the most significant risk faced by banks and the success of their business depends on accurate measurement and efficient management of this risk to a greater extent than any other risks. According to Tetteh (2012) sound credit-giving is one of the most essential principles which strengthen banking institutions in their financial standing. The safety of banking system is depending on the profitability and capital adequacy of banks. Profitability is a parameter which shows management approach and competitive position of bank in market-based banking. This parameter helps the banks to tolerate some level of risk and support them against short-term problems.

Rising bad loans threaten the financial performance of banks, as it reduces both the bank's profit and its intermediation capacity. According to Bhattarai (2017) the immediate consequence of large amount of bad loans in the banking system is bank failure. Considering that the banking industry is a pillar of the economy, any shock to the industry would certainly affect the financial system and the economy as a whole. Bad debt has been trending and becoming a cause of concern for banks' stability in the face of reeling economic downturn. In CBN (2015), the banking industry: large, medium and small bank groups showed vulnerability to the most severe shock of 200 per cent rise in Bad debt, but none of the groups could sustain the impact of the same magnitude of shocks in December 2016 as their post-shock capital adequacy ratios fell below the 10 per cent minimum prudential requirement (CBN, 2016). Oftentimes, the same prudential tools such as liquidity ratio, loans to deposit ratio, large exposure and reserve requirements have been applied to address issues of Bad debt of banks, irrespective of size. The credit management strategies are procedures banks adopted in the mitigation or reducing the negative effect of credit risk. A comprehensive credit management structure is vital because it helps increase the revenue

and survival. The main ideologies in credit management strategies take the form of formation of a clear structure, delegation of powers, discipline, and communication at all level and holding people accountable (Kolapo et al. 2012). The credit management strategies are measures employed by banks to avoid or minimize the adverse effect of credit risk. A sound credit management framework is crucial for banks so as to enhance profitability guarantee survival. Credit management is at the core of lending in the banking industry. Many Nigerian banks had failed in the past due to inadequate risk management exposure. This problem has continued to affect the industry with serious adverse consequences. Banks are generally subject to wide array of risks in the course of their business operations. Nwankwo (1990) observes that the subject of risks today occupies a central position in the business decisions of bank management and it is not surprising that every institution is assessed an approached by customers, investors and the general public to a large extent by the way or manner it presents itself with respect to volume and allocation of risks as well as decision against them. Other risks include insider abuse, poor corporate governance, liquidity risk, inadequate strategic direction, among others. These risks have increased, especially in recent times as banks diversity their assets in the changing market.

This has become a worrisome situation for banks and other stakeholders. In 2018, credit management and bank performance of listed banks in Nigeria revealed that ratio of non-performing loans and bad debt do not have a significant negative effect on the performance of banks in Nigeria. While secured and unsecured loan ratio and bank's performance was not significant (Uwalomwa, Uwuigbe & Oyewo, 2015). In Nigeria, the existing procedures for credit risk management are not adequate to compete with the existing financial and economic challenges thus the need for continued study and analysis on the matter of credit risk and managing it. Kargi (2012) claimed that for most banks, loans are the largest and most obvious source of credit risk; however, other sources of credit risk exist throughout the activities of a bank (Aruwa and Musa, 2014). Banks are increasingly facing credit risk (or counterparty risk) in various financial instruments other than loans, including acceptances, interbank transactions, trade financing, foreign exchange transactions, financial futures, swaps, bonds, equities, options, and in the extension of commitments and guarantees, and the settlement of transactions.

The effect credit management on bad loans of commercial banks has attracted the interest of scholars for the past three decades due to frequent cases of bank distress caused by increasing non-performing loans. However findings of previous authors have been inclusive as some authors' reports positive and some reports negative. Ara, Bakaeva & Sun (2009) have found the positive relationship between credit management and profitability of commercial banks in Sweden. Saeed & Zahid (2016) showed that credit indicators had a positive association with profitability of the banks. Taiwo & Abayomi (2013) found that credit risk management has a significant impact on the profitability of Nigerian banks. Olalere & Ahmad (2015) revealed that there is a negative and significant relationship between Non-performing loan ratio and profitability. From the above problems and controversial findings, this study intends to examine the effect of credit management on the bad loans of commercial banks in Nigeria.

LITERATURE REVIEW

Credit Management Strategies

The credit management is procedures banks adopted in the mitigation or reducing the negative effect of credit risk. A comprehensive credit risk management structure is vital because it helps increase the revenue and survival. According to Tetteh (2012) sound credit-giving is one of the most essential principles which strengthen financial institutions in their financial standing. This researcher stressed that, sound credit giving establishes credit limits as well as develop credit granting process for approving new credits. Credit plays a very vital part in the economic growth and development of a country. These roles credit plays can be categorized into two: it enables the transfer of funds to where it will be most effectively and efficiently used and secondly, credit economizes the use of currency or coin money as granting of credit has a multiplier effect on the volume of currency or coin in circulation.

Credit management means the total process of lending starting from inquiring potential borrowers up to recovering the amount granted. Singh (2013) noted that, in banking sector, credit management is

concerned with activities such as accepting application, loan appraisal, loan approval, monitoring, and recovery of non-performing loans. Saeed and Zahid (2016) described credit management as methods and strategies adopted by a firm to ensure that they maintain an optimal level of credit and its effective management. It is an aspect of financial management involving credit analysis, credit rating, credit classification and credit reporting.

Olalere and Ahmad (2015) viewed credit management as simply the means by which an entity manages its credit sales. It is a prerequisite for any entity dealing with credit transactions since it is impossible to have a zero credit or default risk. Mujtaba (2014) opined that credit management greatly influences the success or failure of commercial banks and other financial institutions. This is because the failure of deposit banks is influenced to a large extent by the quality of credit decisions and thus the quality of the risky assets. He further notes that, credit management provides a leading indicator of the quality of deposit banks credit portfolio. A key requirement for effective credit management is the ability to intelligently and efficiently manage customer credit lines. In order to minimize exposure to bad debt, over-reserving and bankruptcies, companies must have greater insight into customer financial strength, credit score history and changing payment patterns.

Methods of Credit Management

Selection

According to Gestel et al. (2009), a sound credit risk management begins with a proper choosing of borrowers and the products that suit them. For this to be possible, a competent loan officers and Operative models of estimating risk should be in place. This is a very crucial stage because decisions are taken by the entire committee member. Here, borrowers that are likely to default are either denied or asked to secure the loan with more collateral to limit the effect of default.

Credit Limitation

Gestel et al. (2009) stated that this method aids the bank by reducing the amount of loss suffered from a borrower. It prevents the event where the failure of counterparty to meet his or her obligation will heavily affect the financial performance of the bank. The number of riskier transactions is brought to the bearer minimal.

Credit Diversification

Here, banks should deal with different counterparties ranging from individuals, industries. This helps to spread the risk across various borrowers so that banks can reduce the impact of loss; it is much workable for large and international banks. That is, managing credit risk through risk diversification or spread (Gestle et al., 2009; Iyeneomie, & Lucky, 2024).

Compliance to Basel Accord

Basel committee on Banking Supervision enlarges the procedures through which a bank can manage its exposure to credit risk. One of the principles is constantly changing and reviewing their credit risk policies to suit the prevailing economic trend in the country. This can be done by the introduction of new products and services. Secondly, banks should investigate their borrowers properly. This will lead to a better understanding of the customer they are dealing with (Basel Committee on Banking Supervision, 1999; Lucky, Uzah, & Omubo-Pepple, 2023). These strategies do not prevent credit risk totally; however they can reduce the level of credit risk the banks are exposure to. And this will increase the profitability performance of the banks. The Basel II is built on three pillars: 1.Minimum Capital requirement2.Supervisory Review3.Market Discipline Pillar 1 addresses the minimum capital requirement, that is, the rule which a bank calculates its regulatory capital. The minimum required capital ratio (8%) remained unchanged under Basel II while the way to calculate the risk-weighted-assets has been changed. As to the Pillar 2 of Basel II, it concerns with the supervisory review process and has been a supplement to the minimum capital requirement. Therefore, it requires a regular interaction between banks and supervisors in the assessment and planning of capital adequacy (Lind, 2005;). The last pillar seeks to complement these activities through a stronger market discipline by disclosure of bank's key

information of risk assessment procedures and capital adequacy (Ferguson, 2003). This, to some extent, could enable market participants to assess the bank's risk profile and level of capitalization.

Credit Evaluation

Credit evaluation is a loan function that is basic to minimizing loan loss. Through credit evaluation and/or analysis, the bank attempts to determine the ability of the borrower to repay the legitimate loans extended to him. By refusing the credit to a potential borrower whose analysis reveals insufficient financial strength, the bank hopes to improve on its chances to avoid unnecessary losses in its loan portfolio (Nwankwo, 1991). This is a very sensitive stage because it helps ensure loan quality. In simple terms, the giving of credit rest on the sureness the lender has in the borrower's ability to pay (credit worthiness). Credit worthiness is the ability and the readiness of a borrower to settle his or her debt. This is one of numerous issues which determine what should go into the credit policies of a lender. A lot of financial models come into play when assessing the credit worthiness of the deficit units. The most commonly used is the five financial analysis tools which include character, capital, capacity, condition and collateral. These tools are generally known as the 5cs of credit (Machiraju, 2004).

Loan Loss Provision

The guideline further states that licensed banks are required to make adequate provisions for perceived losses based on the credit portfolio classification system prescribed above in order to reflect their true financial condition. Two types of provisions (that is specified and general) are considered adequate to achieve this objective. Specific provisions are made on the basis of perceived risk of default on specific credit facilities while general provisions are made in recognition of the fact that even performing credit facility harbours some risk of loss no matter how small. Consequently, all licensed banks shall be required to make specific provisions for non-performing credits as directed by the regulatory authorities.

Non-Performing Loans

A debt is said to be bad when there is no hope of recovering the amount from the debtor. As soon as a debt is recognized to be bad, it should be transferred from the debtor's account to the debit of an account called Non-performing loans Account (Inanga et al, 2001). In banks, a bad debt is normally written off as a loss and classified as an expense because the debt owed the bank is unable to be collected and all reasonable efforts have been exhausted to collect the amount owed. Before a debt can become bad it will be doubted by the bank of recovery. After the bank is sure that the debt is irrecoverable, then it becomes a bad debt.

Kent (1960) agreed that an account does not become bad overnight at it must have shown some red signs for some time. He pointed out that it is the banker's duty to show considerable interest in such accounts because large volume of credit is likely going to give rise to a large account of non-performing loans if the credit is not well analyzed and managed. Therefore a credit manager should focus on desirable loan. According Holden (1995), a loan is desirable when it falls within the operation area of the bank. A profitable loan or lending is the one that will be repaid and would not be detrimental to the growth and development of the bank in particular but which would also promote the economic growth and development of the community in general. Generally, loan is desirable and suitable only if it is in accordance with the government directive and bank policy. This was buttressed by Nwankwo (1991) who stated that effective lending is that which maximizes profitability, liquidity and security requirements of the banker and the development of the economy.

Anticipated Income Theory

Under this theory, bank's management can plan its liquidity based on the expected income of the borrower and this enables the bank to grant a medium and long-term loans, in addition to short-term loans as long as the repayment of these loans are linked by the borrowers expected income to be paid in the periodic and regular premiums, and that will enable the bank to provide high liquidity, when the cash inflows are regular and can be expected. Deposit money banks can manage its liquidity through appropriate credit management that is directing of granted loans, and ensuring that these loans are collected as at when due in a timely manner and minimize the possibility of delays in repayment at the maturity date (Okoh, Nkechukwu & Ezu, 2016).

This theory holds that banks' management of liquidity can be enhanced by adequate phasing and structuring of the loan commitments to the customers. According to Nzotta (1997) the theory focuses on the earning capacity and borrowers' credit worthiness as the ultimate guarantee for liquidity adequacy. It drives banks' transactions in self-liquidating commitments (Nwankwo, 1991); and encourages the adoption of ladder effects in investment portfolio of commercial banks (Ibe, 2013).

Shiftability Theory

Shiftability is the approach to keep the banks liquid by supporting the shifting of assets. When a bank is short of ready money, it is able to sell its assets to a more liquid bank. The approach allows the banking system run more efficiently: with fewer reserves or investing in long-term assets. Under shiftability, the banking system tries to avoid liquidity crises by enabling banks to always sell or repo at good prices (Okoh, Nkechukwu, and Ezu 2016). The shift ability theory is premised on the argument that banks' liquidity is a function of their capacity to acquire assets that are convertible or marketable to other lenders or investors should there be imminent need for cash, noting that the banks' assets should be marketable to the Central Bank and other financial institutions at discounted values. Thus this theory recognizes marketability or transferability of a bank's assets is a basis for ensuring liquidity. This theory was proposed by H.G. Moulton who insisted that if the commercial banks continue a substantial amount of assets that can be moved to other banks for cash without any loss of material. In case of requirement, there is no need to depend on maturities. This theory states that, for an asset to be perfectly shiftable, it must be directly transferable without any loss of capital loss when there is a need for liquidity. This is specifically used for short term market investments, like treasury bills and bills of exchange which can be directly sold whenever there is a need to raise funds by banks. But in general circumstances when all banks require liquidity, the shiftability theory need all banks to acquire such assets which can be shifted on to the central bank which is the lender of the last resort.

Loan Pricing Theory

Banks cannot always set high interest rates, e.g. trying to earn maximum interest income. Banks should consider the problems of adverse selection and moral hazard since it is very difficult to forecast the borrower type at the start of the banking relationship (Oputu, 2010). If banks set interest rates too high, they may induce adverse selection problems because high-risk borrowers are willing to accept these high rates. Once these borrowers receive the loans, they may develop moral hazard behaviour or so called borrower moral hazard since they are likely to take on highly risky projects or investments (Chodecai, 2004). From the reasoning of Stiglitz and Weiss, it is usual that in some cases we may not find that the interest rate set by banks is commensurate with the risk of the borrowers.

Theory of Multiple-Lending

It is found in literature that banks would be less inclined to share lending (loan syndication) in the presence of well-developed equity markets and after a process of consolidation. Both outside equity and mergers and acquisitions increase banks' lending capacities, thus reducing their need of greater diversification and monitoring through share lending. Degryse et al (2004). This theory has a great implication for banks in Nigeria in the light of the recent 2005 consolidation exercise in the industry.

Hold-up and Soft-Budget-Constraint Theories

Banks choice of multiple-bank lending is in terms of two inefficiencies affecting exclusive bank-firm relationships, namely the hold-up and the soft-budget-constraint problems. According to the hold-up literature, sharing lending avoids the expropriation of informational rents. This improves firms' incentives to make proper investment choices and in turn it increases banks' profits (Von Thadden, 2004; Padilla and Pagano, 1997). As for the soft-budget-constraint problem, multiple-bank lending enables banks not to extend further inefficient credit, thus reducing firms' strategic defaults. Both of these theories consider multiple-bank lending as a way for banks to commit towards entrepreneurs and improve their incentives. None of them, however, addresses how multiple-bank lending affects banks' incentives to monitor, and thus can explain the apparent discrepancy between the widespread use of multiple-bank lending and the importance of bank monitoring. But according to Carletti et al (2006), When one considers explicitly banks' incentives to monitor, multiple-bank lending may become an optimal way for banks with limited

lending capacities to commit to higher monitoring levels. Despite involving free-riding and duplication of efforts, sharing lending allows banks to expand the number of loans and achieve greater diversification. This mitigates the agency problem between banks and depositors, and it improves banks' monitoring incentives. Thus, differently from the classical theory of banks as delegated monitors, their paper suggested that multiple-bank lending may positively affect overall monitoring and increase firms' future profitability.

The Signaling Arguments

The signaling argument states that good companies should provide more collateral so that they can signal to the banks that they are less risky type borrowers and then they are charged lower interest rates. Meanwhile, the reverse signaling argument states that banks only require collateral and or covenants for relatively risky firms that also pay higher interest rates (Chodechai, 2004; Ewert and Schenk, 1998).

Credit Market Theory

A model of the neoclassical credit market postulates that the terms of credits clear the market. If collateral and other restrictions (covenants) remain constant, the interest rate is the only price mechanism. With an increasing demand for credit and a given customer supply, the interest rate rises, and vice versa. It is thus believed that the higher the failure risks of the borrower, the higher the interest premium (Ewert et al, 2000).

Empirical Review

Taiwo and Abayomi (2013) evaluated the impact of credit risk management on bank profitability of some selected DMBs in Nigeria. The result from Panel Least Square (PLS) estimate found that credit risk management has a significant impact on the profitability of Nigerian banks. Bhattarai (2016) examined effect of credit risk on Naples commercial banks' performance. A causal-comparative and descriptive research designs was used. The data was obtained from 14 banks for period between the years 2010 - 2015. The study established that NPL loan ratio had adverse effect on performance of banks while the cost of a loan asset had a positive effect on the overall performance of the banks. It was found that indicators of credit risk, size of the bank had a positive impact on the banks' performance. The study established that the ratio of capital adequacy and cash reserve had no influence on bank performance hence a conclusion of a significant relation between performance of the bank and credit risk indicators. However, this study focused on effect of the credit risk on banks performance and not management of credit risk practices and the financial performance.

Bizuayehu (2016) assessed effect of the management of credit risk on profitability of Ethiopian banks. This study established that, credit risk which is measured by NPL ratio, which indicated a significant inverse impact on financial performance of Ethiopians commercial banks. Chen and Pan (2012) examined the credit efficiency of 34 Taiwanese commercial banks over the period 2005-2008. Their study used financial ratio to assess the credit risk and was analyzed using Data Envelopment Analysis (DEA). The credit risk parameters were credit risk technical efficiency (CR-TE), credit risk allocative efficiency (CR-AE) and credit risk cost efficiency (CR-CE). The results indicated that only one bank is efficient in all types of efficiencies over the evaluated periods. Overall, the DEA results show relatively low average efficiency levels in CR-TE, CR-AE and CR-CE in 2008. Chiejine (2016) reviewed the regulatory intervention of the Central Bank of Nigeria (CBN) in the operations of some borderline banks in year 2009, which culminated in the sacking of the Board of eight (8) banks and their replacement with new Board members selected by CBN as well as injection of public funds to revive the ailing banks. The study also reviewed the ethical issues surrounding the conduct of the directors and management of the embattled banks within the ambit of the Stakeholder theory and the Caux Round Table Business Principles and arrived at the conclusion that the actions of the Nigerian regulatory authorities were justified.

Chimkono et al (2016) carried out a study that was intended to examine the relationship that exists between non-performing loan ratio and other factors and financial performance of commercial banks in Malawi covering a 7-year period from 2008 to 2014. Correlation research methodologies and multiple

regression analysis were adopted. Census study applications were used to collect secondary data from the audited financial statements of 10 commercial banks. In this study, financial performance was measured in terms of return on assets (ROA) while nonperforming loans (NPL) was measured as the NPL ratio (which was calculated as a percentage of nonperforming loans to gross loans, thus Gross NPLs/ Gross loans). It was discovered that non-performing loan ratio, cost efficiency ratio and average lending rate significantly affected bank performance whereas cash reserve ratio directly associated with performance but was insignificant. The authors suggested that the monetary authorities should provide specific support systems to the banking sector and the banks themselves must provide innovations that would enhance their operations.

Clichici and Coleniscova (2015) investigated the impact of several macro-economic variables on non-performing loans in the banking sector of the Republic of Moldova using econometric multivariate linear progression analysis. The study concluded that bank non-performing loans are affected not only by distinctive features of the banking sector and the policy choices of each bank but also by macro-economic environment. The study also established that increase in rate of unemployment and decrease in GDP, exports and remittances lead to an increase in nonperforming loans.

Dagogo and Ngerebo-a (2018) investigation on loan fraud detection and IT-based combat strategies identified credit risk and loan portfolio mismanagement as the major cause of bank losses. The study was carried out to proffer solutions to the problem escalating non-performing loan being experienced as a result of weak controls and dearth of good decision-making mechanisms in loan disbursement. The study noted that huge portfolio of NPL was responsible for failures of some banks in the past. It contributed to loss of investment by bank shareholders and rendered bank loan inaccessible to the public. The role of information technology in the control environment cannot be overemphasized. It is a critical component for designing and enforcing controls, it also requires effective control dynamics in the areas of input, authorization and access in the process of risk identification, prevention of policy violation, guiding against unauthorized lending and boosting the loan portfolio quality of the banks.

Djiogap and Ngomsi (2012) investigated the determinants of bank long-term loan in the Central African Economic and Monetary Community (CEMAC). They used the panel data of 35 commercial banks from six African countries over the period 2001-2010. They used fixed effect model to examine impact of bank size, GDP growth and capital adequacy ratio on NPLs. The study found negative significant impact of CAR on the level of NPLs. Their finding justifies as more diversified banks and well capitalized banks are better able to withstand potential credit. However, inflation variable is statistically insignificant in explaining the total business loans ratios of banks.

Dogarawa (2018) examined credit process, the canons of lending and methods of loan management in the pre-colonial primitive financial sector, used Kundila, a famous 19th Century trader in Kano City as case study. The study employed the interview and desk research techniques to investigate the impact of lending process and loan management on performance, the study found similarities in both the lending process and loan management system of the pre-colonial era and modern practice.

Epure and Lafuente, (2012) examined bank performance in the presence of risk for Costa-Rican banking industry during 1998-2007. The results showed that performance improvements follow regulatory changes and that risk explains differences in banks and non-performing loans negatively affect efficiency and return on assets while the capital adequacy ratio has a positive impact on the net interest margin.

Etale, Ayunku and Etale (2016) investigated the relationship between non-performing loans and bank performance in Nigeria for the period 1995 – 2015. The study analysed the secondary data collected from CBN, NDIC and annual reports of listed banks, using ADF Unit Root test, descriptive statistics and multiple regression techniques and found out that non-performing loans have significant relationship with bank performance. Felix and Claudine (2008) investigated the relationship between bank performance and credit management. It could be inferred from their findings that return on equity (ROE) and return on assets (ROA) both measuring profitability were inversely related to the ratio of non-performing loan to total loan of financial institutions thereby leading to a decline in profitability.

Gambo, Ahmad and Muhammad (2017) examined the relationship between bank specific and macroeconomic determinant of non-performing loans in Nigerian deposit money banks over the period of 5 years (2010 to 2014). A sample of 10 banks out of 15 quoted by the Nigerian Stock Exchange (NSE) was considered on across sectional basis. The study adopted non-survey research design and secondary data was used, generated from the bank’s annual reports and accounts, Central Bank of Nigeria (CBN) and Nigerian Stock Exchange fact book respectively. The data were analyzed using descriptive statistics, correlation coefficient and multiple regressions. As thus, Stata (version 12) was used as a statistical tool for data analysis. The findings reveal positive significant relationship between Non-Performing loans and Loan to deposit and Bank size; whereas relationship between capital adequacy ratio and Inflation reveals a positive insignificant relationship; whereas Return on asset had negative insignificant relationship with the rate of non-performing loans.

Gap in Literature

Most of researchers have focused on one or several countries and showed different results. However, no researcher has put the research in Nigeria using all the deposit money banks in Nigeria. Therefore, we have found the existence of geographical gap and devote our effort to conduct a research on the effect of credit management on the profitability of deposit money banks in Nigeria. Most research work we explored on credit management and profitability of banks covered up to 2018, so we saw the existence of time gap.

METHODOLOGY

For the purpose of this study, quasi experimental research design was used. This approach combines theoretical consideration (a prior criterion) with the empirical observation and extract maximum information from the available data. It enables us therefore to observe the effects of explanatory variables on the dependent variables. The target population of this study includes all 24 deposit money banks in Nigeria. However, the sample size was limited to the 15 quoted deposit money banks that are reporting to the Nigerian stock exchange. The reason for the sample size is for easy source and reliability of required data from the annual reports submitted to the exchange.

Data Analysis Method

The method of data analysis to be used in this study was the panel data multiple linear regressions using Ordinary Least Square (OLS) method. This approach, which is a quantitative technique, includes tables and the test of the hypotheses formulated by using ordinary least square regression analysis at 5% level of significance. To arrive at a result that will not lead to spurious regressions, the study will test for stationarity at different levels in the variables making up the model. Other tests that will be carried out on the model include test of Normality, Durbin Watson Test of serial correlation, test of heteroskedasticity and test of model specification so as to achieve the objectives of our study as well as answer the research question and hypotheses. Moreover, in order to undertake a statistical evaluation of our analytical model, so as to determine the reliability of the results obtained and the coefficient of correlation (r) of the regression, the coefficient of determination (r²), the student T-test and F-test will be employed.

Model Specification

The study adopts the panel data method of data analyses which involve the fixed effect, the random effect and the Hausman Test.

Pooled Effect Model

$$BL_{it} = f(\beta_1CS + \beta_2CL + \beta_3CD + \beta_4CE + \beta_5LLP + \dots + \varepsilon_{it}) \quad 1$$

Fixed Effects

The fixed effects focus on whether there are differences by using a fixed intercept for each of the different cross-sectional structures. If we assume that the dummy variable for a conglomerate company is 1 or 0, then D_i , which is the dummy variable for firm i , can be expressed as:

$$D_i = \begin{cases} 1, & i-1 \\ 0, & otherwise \end{cases} \quad D_2 = \begin{cases} 1, & i-2 \\ 0, & otherwise \end{cases} \quad \dots \quad D_N = \begin{cases} 1, & i-1 \\ 0, & otherwise \end{cases} \dots \dots \dots (2)$$

The regression of total samples can be expressed as:¹

$$Y_{it} = \sum_{i=1}^N \beta_{oi} D_i + \beta_i D_s + \beta_2 D_{ma} + \beta_3 s_1 + \beta_{oi} D_4 s_2 + \varepsilon_{it} \dots\dots\dots(3)$$

The dummy variables are expressed as follows: if $j = i$, then $Di = 1$; otherwise $Di = 0$.²

To further investigate the fraud effect, Adebayo (2012) analyzed whether the independent variables affect the dependent variable, this regressed the effect of the independent variables on the dependent variables.

$$BL_{it} = f(\beta_1 CS + \beta_2 CL + \beta_3 CD + \beta_4 CE + \beta_5 LLP + \varepsilon_{it}) \quad 4$$

Because the fixed effects account for both cross-sectional and time-series data, the increased covariance caused by individual-firms differences is eliminated, thereby increasing estimation-result efficiency.

Random Effects

Random effects focus on the relationship with the study sample as a whole; thus, the samples are randomly selected, as opposed to using the entire population. The total sample regression (a function of the random effect) can be expressed as:

$$BL_{it} = \sum_{j=1}^N \beta_0 + f(\beta_1 CS + \beta_2 CL + \beta_3 CD + \beta_4 CE + \beta_5 LLP + U) \dots\dots\dots 8$$

If this is represented with random variables, then $\beta_{oj} = \bar{\beta}_0 + \mu_j$, which indicates that the difference occurs randomly, and the expectation value of β_{oi} is $\bar{\beta}_0$.⁵ (9)

- BL = Bad loans proxy by percentage of nonperforming loans to total loans and advances
- CS = credit selection proxy by percentage of increase/ decrease in nonperforming loans
- CD = Credit limit measured by percentage of increase/ decrease in loan loss provisions
- CD = credit diversification measured by log of credit to various sectors of the economy
- CE = Credit valuation measured by log of nonperforming loans
- LLP = Loan loss provision measured by log of loan loss provisions
- Ut = Error term

Hausman Test

The Hausman test YairMundlak,(1978) is the most commonly used method for evaluating fixed and random effects. If variables are statistically correlated, then the fixed-effects estimation is consistent and efficient, whereas the random-effects estimation is inconsistent, and the fixed-effects model should be adopted. Conversely, if the variables are statistically uncorrelated, then the random-effects estimation is consistent and efficient, whereas the fixed-effects estimation is consistent but inefficient, and the random-effects model should be adopted.-

A-prior Expectation of the Result

The explanatory variables are expected to have positive and direct effects on the dependent variables. That is a unit increase in any of the variables is expected to increase ROI. This can be expressed mathematically as $a_1, a_2, a_3, a_4, a_5, a_6 > 0$.

ANALYSIS OF RESULTS AND DISCUSSION OF FINDINGS

Table 1: Presentation of Multiple Regression Results

| Variable | Coefficient | | Std. Error | t-Statistic | Prob. |
|---|-------------|-----------------------|------------|--------------|----------|
| Pooled regression model | | | | | |
| CS | -0.257596 | | 0.131048 | -1.965665 | 0.0515 |
| CL | 0.422457 | | 0.133270 | 3.169935 | 0.0019 |
| CD | -0.027799 | | 0.041787 | -0.665256 | 0.5071 |
| CE | 0.183524 | | 0.145949 | 1.257456 | 0.2128 |
| LLP | -0.147233 | | 0.154718 | -0.951618 | 0.3446 |
| C | 4.983504 | | 0.390033 | 12.77712 | 0.0000 |
| R-squared | 0.113821 | Mean dependent var | | | 6.014077 |
| Adjusted R-squared | 0.092722 | S.D. dependent var | | | 0.873964 |
| S.E. of regression | 0.832461 | Akaike info criterion | | | 2.501425 |
| Sum squared resid | 87.31692 | Schwarz criterion | | | 2.589657 |
| Log likelihood | -158.5926 | Hannan-Quinn criter. | | | 2.537277 |
| F-statistic | 5.394496 | Durbin-Watson stat | | | 0.664383 |
| Prob(F-statistic) | 0.001589 | | | | |
| Fixed regression model | | | | | |
| CS | -0.338806 | | 0.157153 | -2.155899 | 0.0332 |
| CL | 0.310404 | | 0.112929 | 2.748666 | 0.0070 |
| CD | 0.070094 | | 0.038187 | 1.835546 | 0.0690 |
| CE | -0.667807 | | 0.234754 | -2.844709 | 0.0058 |
| LLP | -0.006956 | | 0.035447 | -0.196248 | 0.8450 |
| C | 5.526666 | | 0.698378 | 7.913569 | 0.0000 |
| Effects Specification | | | | | |
| Cross-section fixed (dummy variables) | | | | | |
| R-squared | 0.574688 | Mean dependent var | | | 6.014077 |
| Adjusted R-squared | 0.518726 | S.D. dependent var | | | 0.873964 |
| S.E. of regression | 0.606304 | Akaike info criterion | | | 1.951946 |
| Sum squared resid | 41.90685 | Schwarz criterion | | | 2.304873 |
| Log likelihood | -110.8765 | Hannan-Quinn criter. | | | 2.095352 |
| F-statistic | 10.26922 | Durbin-Watson stat | | | 1.202889 |
| Prob(F-statistic) | 0.000000 | | | | |
| Random regression model | | | | | |
| CS | -0.268080 | | 0.132208 | -2.027711 | 0.0447 |
| CL | 0.337411 | | 0.110673 | 3.048706 | 0.0028 |
| CD | 0.055819 | | 0.037188 | 1.501018 | 0.1359 |
| CE | -0.140510 | | 0.110194 | -1.275115 | 0.2058 |
| LLP | -0.650735 | | 0.269151 | -2.417732 | 0.0178 |
| C | 5.099063 | | 0.553082 | 9.219368 | 0.0000 |
| Effects Specification | | | | | |
| | | | | S.D. | Rho |
| Cross-section random | | | | 0.622254 | 0.5130 |
| Idiosyncratic random | | | | 0.606304 | 0.4870 |
| Weighted Statistics | | | | | |
| R-squared | 0.887795 | Mean dependent var | | | 1.770910 |
| Adjusted R-squared | 0.666076 | S.D. dependent var | | | 0.628523 |
| S.E. of regression | 0.607403 | Sum squared resid | | | 46.48624 |
| F-statistic | 6.042285 | Durbin-Watson stat | | | 1.092475 |
| Prob(F-statistic) | 0.000090 | | | | |
| Unweighted Statistics | | | | | |
| R-squared | 0.664021 | Mean dependent var | | | 6.014077 |
| Sum squared resid | 92.22378 | Durbin-Watson stat | | | 0.673693 |
| Correlated Random Effects - Hausman Test | | | | | |
| Test Summary | | Chi-Sq Statistic | | Chi-Sq. d.f. | Prob. |
| Cross-section random | | 3.457394 | | 3 | 0.3263 |

Source: Extract from E-view, 2020

The Hausman (1978) specification was used to determine the appropriate model fixed or random effects models. Table 4.2 shows Hausman specification test of $p = 0.3263$ and a probability coefficient of 0.3263. This shows that random effect model is more appropriate, because the null hypothesis is not rejected. Therefore, this includes insignificant P-value, $\text{Prob} > \chi^2$ larger than 0.05, then it is more suitable to use random effects.

The adjusted R^2 of 0.666076 implies that 66.6 per cent variations in the performing loans portfolio can be accounted for by the independent variables. This means 33.4 per cent of variations in the performing loans of the quoted commercial banks are explained by exogenous variable. This showed that the independent variable values have at 67 per cent significant influence on performing loans portfolio of the commercial banks. This also indicates that there are other variables that influence the variations in the level of performing loans. The **F-statistics** (Fisher statistics which is a measure of the overall goodness of fit of regression) of 6.04228 and probability of 0.000090 which implies that the regression model fitted the data, therefore there is goodness of fit. D-W statistics also showed significant values. The value of the DW statistics which ranges from 1.092475 further indicates that the regression equation is the presence of autocorrelation. This enables us to test for cointegration.

Furthermore, from the random effect results, it is evident that bank risk diversification and Basel compliance have positive relationship with performing loans portfolio while risk transfer has negative relationship with performing loans of the commercial banks. The estimated model proved that the regression intercept is positive and significant which implies that holding other variables constant, performing loan of the commercial banks increases by 5.09 units. Furthermore, the regression coefficient proved that credit selection, credit limit, credit diversification has positive effect on bad loans while credit limit, loans loss provision and credit evaluation have positive effect on the dependent variable.

DISCUSSION OF FINDINGS

The model formulated to test the relationship between bank risk diversification, Basel compliance, risk transfer and incidence of bad loans of quoted commercial banks in Nigeria. After cross examination of the fixed effect and the random effect regression results, the study adopted the random effect model. The estimated model found that the explanatory variables can explain 66.6 per cent variations on the performing loan portfolio of the commercial banks over the periods covered in this study.

Further examination of the results from the F-statistics and probability justifies that the model is significant. The estimated beta coefficient of the variables indicates that bank risk diversification have positive and significant effect on performing loan portfolio of the commercial banks, the coefficient justifies that a unit increase on the variables adds 0.33 units to performing loan portfolio while the results further proved that Basel compliance have positive but no significant effect on the dependent variable such that a unit increase can lead to 0.05 unit increase on performing loan portfolio. Both bank risk diversification and Basel compliance have positive relationship which confirms our a-priori of the study and justifies the objective of risk diversification and the formulation of Basel risk compliance strategies.

The positive effect of bank risk diversification on performing portfolio of the commercial banks confirm the modern portfolio theory which tries to explain how investors could maximize their returns and minimize their risks by diversifying in different assets. Markowitz (1952) and Tobin (1958) showed that it was possible to identify the composition of an optimal portfolio of risky securities, given forecasts of future returns and an appropriate covariance matrix of share returns. The positive findings further confirm risk management theory that market and credit risks would have either direct or indirect effect on banks survival (Eichhorn, 2004) which revealed a strong association between the credit scoring and the performance in financial perspective of the SACCOs and found that credit administration in deposit-taking SACCOs had a strong relationship with performance in financial perspective. The findings of Wangi et al., (2014) that financial performance of Kenyan microfinance industry has been impacted by Non-Performing Loans and the effects on the survival of small and medium enterprises.

However, the result as presented in table 4.2 indicates that risk transfer have negative and significant relationship with performing loan portfolio of the commercial banks. The coefficient of the variable indicates that if the variable is increase by a unit, performing loans of the commercial banks will reduce by 0.26 units. The finding is contrary to a priori expectation. The negative relationship between the variable can be traced non-compliance of the commercial banks to relevant rule and regulations guiding the operation of Nigeria Deposit Insurance Corporation as established in 1988. It could also be traced to poor credit risk management strategies of the commercial banks. The negative effect of the variable contradicts the findings of Roman and Tomuleasa (2013) that the increase in non-performing loans had a negative impact on banks profitability. Saba, Kouser & Azeem (2017) that real total loans have positive significant effect on non-performing loan portfolio, Shingjergji (2013) that total loans level is positively influencing the NPLs means increased loans level will result in increased level of NPLs and the findings of Sufi and Qaisar (2015) that credit terms and appraisal of clients has a positive and a significant impact on performance of loan, whereas credit policy and control of credit risk has insignificant but positive effect on loan performance.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study examined the effect of credit risk on incidence of bad loans quoted commercial banks in Nigeria. Chapter one contains background, problem identification, specific objectives, research questions and null hypotheses, chapter two had literature review which include conceptual, theoretical and empirical review. Chapter contains the methodology, the study adopted ex-facto research design, panel data was collected from financial statement of the quoted commercial banks for a period of 10 years while panel ordinary least square was used as data analyses methods. Detail presentation of the results on how credit risk affects loan portfolio of the commercial banks was presented in chapter 4 while chapter 5 has details on the discussions of the study findings. The regression result on hypothesis I presented in table 4.2 proved that 66.6 per cent variations in the incidence of bad loans can be accounted for by the independent variables. The random effect results found that bank risk diversification and Basel compliance have positive relationship with performing loans portfolio while risk transfer have negative relationship with performing loans of the commercial banks.

From the findings, the study concludes that there is no significant relationship between credit selections and bad loans of quoted commercial banks in Nigeria. That there is no significant relationship between credit limit and bad loans of quoted commercial banks in Nigeria. That there is no significant relationship between credit diversification and bad loans of quoted commercial banks in Nigeria. That there is no significant relationship between credit evaluation and bad loans of quoted commercial banks in Nigeria. That there is no significant relationship between loans loss provision and bad loans of quoted commercial banks in Nigeria

Recommendations

- i. Loan product diversification across different sectors and products has beneficial effects on the credit risk management, this study recommend that loan diversification across the various sector of nigerian economy should be properly appraised and the sectors well examined to avert the problem of nonperforming loans from the sectors. Risk diversification is one major way of effective credit risk management; therefore, management should enhance risk diversification policies.
- ii. Commercial banks in Nigeria should put more emphasis on risk management such as credit appraisal methods, loan monitoring and credit worthiness analysis, credit score analysis and internal ratings in their credit risk management practices.
- iii. Based on the findings of this study work, the researcher recommends the need to strengthen supervision of banks by the Central Bank of Nigeria (CBN) and the Nigeria Deposit Insurance Corporation (NDIC) to enhance credit risk management behaviour of the commercial banks

- iv. Banks should maintain high credit standards and all credit and risk management specifications should be properly complied and management of the commercial banks should perfect all collaterals which are used for obtaining loans. The collateral should be more than the value of loan approved, in case of default.
- v. Bank management should consider monitoring of loans as priority in credit management functions. Insider dealing should be outlawed in banks in Nigeria. This was a major source of huge nonperforming loans portfolio in 1990s. Over extension of loans to promoters, directors and other large shareholders is often done at the detriment of depositors because such funds often become irrecoverable.

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