CREDIT ADMINISTRATION AND PERFORMING LOANS OF COMMERCIAL BANKS IN NIGERIA: A PANEL DATA ANALYSIS

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ABSTRACT

This study examined the effect of credit administration on performing 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 2009-2018. Performing loan portfolio was used as dependent variables while bank credit monitoring; credit appraisal and internal lending policies were used as independent variables. 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. Panel unit roots and panel cointegration analysis were conducted on the study. Internal lending policies and credit appraisal have positive relationship with performing loans portfolio while credit monitoring has negative relationship with performing loans portfolio. From the findings, the study concludes that credit administration has significant relationship with loan portfolio of Nigeria commercial banks. We recommend that credit should be properly appraised and fully monitored.

KEYWORDS: Credit Administration, Performing Loans, Commercial Banks, Nigeria, Panel Data Analysis

INTRODUCTION

Credit administration is the managerial process involving planning, organizing and controlling of the bank's lending effort. It includes all the considerations made in designing the loan objectives, policies and procedures. It also includes all the steps taken in analyzing and appraising a given loan proposal. Assuming that the proposal passes all the tests of viability, credit administration extends to the concerted activities related to careful monitoring and control of the facility till the loan is fully discharged. In sum, credit administration begins at the board of directors and ends at the 'board' of repayment Ezirim and Emeyonu, (1998). It starts at the point of policy formulation and ends at the point of repayment or recovery, whichever is applicable. It is the managerial as well as the operational activities attendant to the lending function of a bank Ezirim and Emeyonu, (1998). The lending function is defined for the outflow side of considered financial intermediation principle. The nature,

magnitude and requirements of the lending function create an immense task for credit administration. It is not a place for mediocrity management. Loan administration is a highly technical operation where not every person can handle. Loan administration is fraught with enormous risk that demands careful management. It is a high-income base or center that should not be treated with levity. It therefore demands high managerial attention (Khanam, 2005).

Every bank has to develop and implement comprehensive procedures and Information systems to follow up the condition of individual credits. An effective loan monitoring system according to Odufuye (2007) will include measures to: Monitor compliance with established agreements, Assess, where applicable, collateral coverage, relative to creditor's current condition, identify contractual payment delinquencies and classify potential credits on a timely basis, and, Direct actions at solving problems promptly for remedial management. Loan monitoring which is the work of the relationship manager in most cases is not a choice, but an imperative for effective and efficient credit administration in the banking sector. Problem loans can easily be spotted out. The banker's experience, knowledge of the customer's business and above all, faith in the customer can be a guide in taking a decision as to how far the customer can be supported before declaring the loan as bad. In some occasions, the customer may be in need of more support.

The main ideologies in credit risk 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 risk management strategies are measures employed by banks to avoid or minimize the adverse effect of credit risk. A sound credit risk management framework is crucial for banks so as to enhance profitability, guarantee survival and reduce the incidence of nonperforming loans (Soludo, 2005). While there are many studies on the effect of credit risk management, most of the studies focused on the effect of credit risk management on profitability of commercial banks. Walsh (2010) carried out an assessment of the credit management process of credit unions. The study found that credit unions are deficient in the credit control department. In Nigeria, Olawale (2014) studied how commercial banks in Nigeria performances are affected by credit risk during the period of 2008 to 2012. Kolapo, et al. (2012) also analyzed the influence of credit risk on performance of five banks in Nigeria by taking data from 2000-2010. From the above, this study examined the effect of credit administration and performing loans quoted commercial banks in Nigeria.

LITERATURE REVIEW
Credit Administration
Credit administration is a 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 (Singh, 2013) sound credit-giving is one of the most essential

principles which strengthen financial institutions in their financial standing. Sound credit management, giving establishes credit limits as well as develop credit granting process for approving new credits will ensure reduction in credit default. 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.

Singh (2013) noted that credit administration means the total process of lending starting from inquiring potential borrowers up to recovering the amount granted. It is 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. Credit risk management 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.

Credit Monitoring

Every bank has to develop and implement comprehensive procedures and Information systems to follow up the condition of individual credits. An effective loan monitoring system according to Odufuye (2007) will include measures to: Monitor compliance with established agreements, Assess, where applicable, collateral coverage, relative to creditor's current condition, identify contractual payment delinquencies and classify potential credits on a timely basis, and, direct actions at solving problems promptly for remedial management. Loan monitoring which is the work of the relationship manager in most cases is not a choice, but an imperative for effective and efficient credit administration in the banking sector. Problem loans can easily be spotted out. The banker's experience, knowledge of the customer's business and above all, faith in the customer can be a guide in taking a decision as to how far the customer can be supported before declaring the loan as bad. In some occasions, the customer may be in need of more support. Any or a combination of the following strategies can then be employed,

i.   Alteration or waiver of some of the terms and conditions of loan agreement in a way not to tamper with the bank's interest. However, this must be communicated to the credit department. Issuance of additional collateral security, if available. Granting of additional funds, if borrower's circumstances and analysis require the need.

ii.   Extension of loan repayment period supported by fresh cash flow statement. Regardless of genuine efforts of parties to a loan, default can still occur. The recovery of loans should be a prerogative of the Recovery Unit to ensure that appropriate recovery strategies are implemented.

iii.   Financial statements like the balance sheet and income statement do not covey relevant financial information necessary for any economic decision, as their figures are in their absolute terms. But when items in these statements are related to each other (inter or intra), a more relevant financial information is generated for an objective and reliable investments decision. This is where ratio comes in.

Ratio is a tool used in generating financial information for an informed business decision and it is the relationship between two items expressed in Naira & Kobo in the financial statements. It is the relation that one item bears on another. Pandey (2005) in Okereke (2003) defined ratio as the process of identifying the financial strengths and weaknesses of the firm by properly establishing relationships between the items in the Balance Sheet and the Profit and Loss Account. This implies that different relationships are determined depending on the purpose for which the user wants. That is why the usefulness of ratios is limited. It requires the user or analyst to select the right figures or group of figures from the financial statements for proper relationship depending on the need at any given time. For the lending banker, he may be interested in liquidity, profitability, management, activity or leverage of the borrower. Hence, we have liquidity ratios, profitability ratios, activity ratios, leverage ratios, etc. Each of these ratios analyses the components of the profit and loss account or/and the balance sheet.

Internal Credit Policy

The management of any loan starts with credit policy, the formulation of which is the responsibility of which is the bank board of directors and management. It is the base for determining what type of credit to grant to customers. Nwankwo (1980) defines credit policy as a blue print containing management guidelines for use by line officer of a bank in the handling of credit applications. Its objective is to provide corporate direction through a standardized procedure, derived from operational interest of the bank, in satisfying the customer credit need but with full cognizance of the prevented monetary and fiscal policy guidelines of the government. Adekanye (2010) however identifies three basic types of credit policy. They are the restrictive credit policy, moderate credit policy and liberal credit policy. A restrictive credit policy is adopted by a bank that has no plan to grow at a rate that is more than minimal. Such a bank is not willing to take any risk more than minor one and prefer to do business with customer whose paying habit almost never varies within terms. Moderate credit policy is a mixture of restrictive and liberal policy approaches to credit. It tends to match receivable to provide adequate cash flow, while a liberal policy is a high-risk policy with the probability of heavy loss of receivable the danger of such bank survival can be real because they are usually prone to undercapitalization and occasionally liquidity problem. Therefore, to minimize risks, enhance lending and maintain standard, the loan policy should specify the quantity of loan to be made the type of securities to be accepted and limits for the different types of loan.

Credit Appraisal

Pursuance of all alternatives to maximize recovery, including placing customers into receivership or liquidation as may be appropriate. Ensuring that adequate and timely loan loss provisions are made based on actual and expected losses and Regular review of deteriorating loans. It should be emphasized that after a loan has been classified as substandard, it should be assigned to a specific Account Manager in the Recovery Unit. The Account Manager serves as the primary customer contact during the recovery process. A number of methods exist for recovering debts owed by banks. Some of these, according to Ademu (2009) are:

i. Appeals to debtors, threats and blackmail, legal action, use of debt-factoring companies, invoice discounting, seizure and sale of collaterals, use of Nigerian Deposit Insurance Corporation's services

ii. Financial analysis is a quantitative exposition of the strengths and weaknesses of the operations of business enterprise Okereke, (2003). This means that the performance (good or bad) of the enterprise is exposed to the user(s) in quantitative terms upon which an interpretation is carried out and informed decision taken. Financial analysis is objective and scientific since it is based on facts and standards. It is multidimensional. The performance of a company in a specific area say, profitability may be of interest to one user but may not be of interest to another. Thus, financial analysis varies according to the specific interests and needs of the users. For instance, bankers, and other creditors, is highly interested in the liquidity and profitability of the borrower(s) while investors in shares of a company are interested in present and expected future earnings and the stability of these earnings in relation to other companies in the same industry. Management of the company has a different interest from government, etc. Interpretation of financial statements starts from where the analysis stopped. It is a deliberate attempt to explain the result of an analysis in such a way that information content is effectively communicated to the user. It explains the broad trend of the business. While analysis is in mathematical form, interpretation is in qualitative.

It can therefore be seen that interpretation of financial statements is the conversion of a quantitative meaning of an analysis into a qualitative meaning for proper understanding and application to real economic situation. According to Pickles (2006) interpretation of account is explanation and application of translation into clear and simple form of the data presented by the profit and loss account and balance sheet of business; to make such deductions and draw inferences as may be possible there from as to its operations, financial position, and prospects. Criticism of financial statements involves a written objective opinion or judgment about the good and bad qualities of their analysis. It looks, at the items in the statement, tools of financial analysis used and the results arising there from. The reason for this exercise is to guide against such bad qualities identified and make adequate provision(s). For

instance, if current asset ratio is used to analyze the liquidity of a company, who is presenting a proposal for loan application, and the ratio obtained is interpreted positively (good performance). But on a closer and critical look, the current assets is dominated with obsolete assets, such results will automatically increase the banker's risk of lending to such borrower. The banker is in a better position to decide whether such lending is worth the risk or not.

Theoretical Foundations
Modern Portfolio Theory
Markowitz (1952) Modern portfolio theory (MPT) is one of the most important and powerful economic theories dealing with finance and investment. Modern portfolio theory measures the benefits of diversification, known as not putting all your eggs in one basket. Modern portfolio theory (MPT) is an investment theory which tries to explain how investors could maximize their returns and minimize their risks by diversifying in different assets. Tobin (1958) expanded the theory of Markowitz's by adding the analysis of risk-free assets which made it possible to affect portfolios on the efficient frontier. 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 portfolio theory approach is the most relevant and plays an important role in bank performance studies (Atemnkeng and Nzongang, 2006). According to the Portfolio balance model of asset diversification, the optimum holding of each asset in a wealth holder's portfolio is a function of policy decisions determined by a number of factors such as the vector of rates of return on all assets held in the portfolio, a vector of risks associated with the ownership of each financial assets and the size of the portfolio. It implies portfolio diversification and the desired portfolio composition of commercial banks are results of decisions taken by the bank management.

The ability to obtain maximum profits depends on the feasible set of assets and liabilities determined by the management and the unit costs incurred by the bank for producing each component of assets (Atemnkeng and Nzongang, 2006). Commercial Banks should consider diversifying investments portfolio to minimize risk of credit takers defaulting in loans repayments and causing non-performing loans portfolios that affects profitability. The concept of revenue diversifications follows the concept of portfolio theory which states that individuals can reduce firm-specific risk by diversifying their portfolios. The proponents of activity diversification or product mix argue that diversification provides a stable and less volatile income, economies of scope and scale, and the ability to leverage managerial efficiency across products and for the case of commercial banks, reduce non-performing Loans and increase Return on Assets which is a measure of profitability.

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 and 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.

Empirical Review

Aduda and Gitonga (2011) explored a relation between the management of credit risk and the banks' lending profitability and concluded that management of credit risk has a great impact on commercial banks profitability. The effects of management of credit risk practices on profitability of SACCOs that are allowed to take deposits were investigated by (Makori, 2015).

Ahmad and Ariff (2007) examined the key determinants of credit administration of commercial banks on emerging economy banking systems compared with the developed economies. The study found that regulation is important for banking systems that offer multi-products and services; management quality is critical in the cases of loan-dominant banks in emerging economies. An increase in loan loss provision is also considered to be a significant determinant of potential credit. The study further highlighted that credit risk in emerging economy banks is higher than that in developed economies.

Ahmed and Malik (2017) investigated the influence of credit risk management practices on loan performance of Pakistani microfinance banks. Primary data was collected from 157 credit risk managers of microfinance banks in Islamabad and Rawalpindi, who were stratified into top, middle and lower level managers. The study used correlation and multiple regression analysis to evaluate the data collected from the managerial level credit risk management staff of the micro finance banks and established that credit appraisal and credit terms have significant effects on loan performance, while collection policy and credit risk control have positive but insignificant effect on loan performance. The study recommended that banks need to focus more on deployment of effective credit terms, credit risk control and credit policy, as part of measures aimed at enhancing loan performance.

Etale, Ayunku and Etale (2015) investigated the relationship between non-performing loans and bank performance in Nigeria for the period 1994-2014. The study employed ADF Unit Root test, descriptive statistics, and multiple regression techniques to analyze data collected for the study from the CBN, NDIC and annual reports of listed banks. The results of the study show that BAL and DOL had statistically negative significant influence on ROCE, while SUL had statistically negative insignificant impact on ROCE. These results show that high level of non-performing loans would reduce the performance of banks in the long run in Nigeria. The study therefore recommended that credit reporting agencies and supervising authorities should be strengthen in order to reduce the high level of non-performing loans in the banking sector of Nigeria.

Ali (2015) conducted an investigation into the effects of credit risk management on the financial performance of commercial banks in Jordan during the period 2005 -2013. The purpose of the study was to examine the influence of credit risk management indicators (such as capital adequacy ratio (CAR), ratio of non-performing loans to gross loans (NPL/GL), ratio of credit interest to credit

facilities (CI/CF), leverage ratio and the ratio of facilities loss to net facilities (FL/ NL)) on financial performance (profitability) of commercial banks. Profitability was measured by ROA and ROE. Panel regression in the form of pooled least squares and correlation analysis was carried out along with descriptive statistics. Stationarity of the variables was tested with the ADF. Secondary data from the annual reports of 13 banks were used and analyzed. Empirical findings indicate that the ratio of non-performing loans to gross loans positively related to financial performance and an inverse relationship was found between the ratio of facilities loss to net facilities and financial performance but no impact of CAR and CI/CF on financial performance was recorded. The study recommended an improvement in the credit management procedures through an establishment of appropriate policies.

Al-Khouri (2011) assessed the impact of bank's specific risk characteristics, and the overall banking environment on the performance of 43 commercial banks operating in 6 of the Gulf Cooperation Council (GCC) countries over the period 1998-2008. Using fixed effect regression analysis, results showed that credit risk, liquidity risk and capital risk are the major factors that affect bank performance when profitability is measured by return on assets while the only risk that affects profitability when measured by return on equity is liquidity risk.

Alshatti (2015) assessed effect of credit risk management on Jordan commercial banks performance in financial perspective. The study sampled thirteen banks for the years 2005 – 2013 and established that management of credit risk impacts the banks' financial performance. From this study, it was resolved that management of credit risk indicators has a significant effect on banks' financial performance. The study recommended that banks should develop or adopt a credit risk management system to help them to improve or enhance their profits. The study focused on credit risk indicators including nonperforming loans, leverage and loss provision on facilities and not on the risk management practices like credit risk identification, appraisal, control and monitoring.

Aremu, Suberu and Oke (2016) studied the effect of credit processing and administration on non-performing loans in the Nigerian banking industry and found out that lending is one of the major functions of banks in all economies and that interest charged on loans constitutes a significant part of bank earnings. However, the possibility that loan repayment obligations may be defaulted creates miseries for the lender, the borrower and the economy as a whole. The study identified bad loans as a major threat to the profitability and stability of banks in Nigeria. It reviewed existing literatures on the concepts and theory of credit, and recommended strict adherence to the tenets of prudential lending as laid down in the policies and regulatory framework. It emphasized its findings that, if the credit analysis and administration systems are weak, loan loss will always be huge, profitability of banks will be impaired and the economy as a whole will receive a hit.

Arko (2012) on the causes and effects of NPLs on MFIs' operations in Ghana, it was asserted that the lender should ensure that good decisions are made relative to granting of loans with the object of minimizing credit risk. In other words, the lender ought to always aim to assess the extent of the risk associated with the lending and try to minimize factors that could otherwise compromise repayment. The scholar further asserts that, needless to say, the lender should gather information regarding the prospective borrower that will assist in reaching a sound credit decision. It was noted that in order to mitigate NPLs which are occasioned by non-repayment of loans, MFIs in Ghana have adopted a standard loan request procedure and requirements that are usually contained in credit policy manual with the object of guiding loan officers and customers.

Asantey and Tengey (2014) studied the effects of bad loans on banks' lending ability and financial performance using secondary data from the annual reports of four listed commercial banks (Eco bank, GCB Bank, CAL Bank, and Agricultural Development Bank) for a-5 year period covering 2008 to 2013. The aim of the paper was to examine the effects of bad loans on the lending ability and net profit (return on investment) of the banks. Pearson correlation test and OLS were used to examine the data. The study discovered a high negative correlation between bad loans and lending ability at 0.05 alpha levels and a high negative correlation between bad loans and financial performance, measured as return on investment or net profit at 0.05 levels.

Literature Gap

The effect of credit risk management on banking business has well been documented in literature. Existing literature focused more on the effect of the variables on performance measuring various indicators of profitability. There is death of literature on the relationship between credit risk management and loan portfolio of commercial banks most especially the emerging financial markets of African counties and Nigeria specifically. This study focused on the existing relationship between credit administration and loan portfolio of quoted commercial banks in Nigeria.

METHODOLOGY

The study employed the ex-post factor research design which entails the utilization of historical data to forecast future trends employing econometric or analytical techniques. The use of ex-post facto design enables researchers to analyse past trends and explain the relationship between the dependent and independent variables. The population of the study covers 24 reporting commercial banks to Central Bank of Nigeria. However, the sample size covered 13 quoted commercial banks in Nigeria existing within the time scope of this study. Panel data used in the study were collected from annual reports and various databases of the banks for financial statement for the period 2009 to 2018.

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. 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.

1. **Coefficient of Determination (r^2) Test** –This measures the explanatory power of the independent variables on the dependent variables. For example, to determine the proportion of economic growth in our model, we used the coefficient of determination. The coefficient of determination varies between 0.0 and 1.0. A coefficient of determination says 0.20 means that 20% of changes in the dependent variable is explained by the independent variable(s).
2. **F-Test:** This measures the overall significance. The extent to which the statistic of the coefficient of determination is statistically significant is measured by the F-test. The F-test can be done using the F-statistic or by the probability estimate. We use the F-statistic estimate for this analysis.
3. **Student T-test:** measures the individual statistical significance of the estimated independent variables at 5% level of significance.
4. **Durbin Watson Statistics:** This measures the colinearity and autocorrelation between the variables in the time series. It is expected that a ratio close to 2.00 is not auto correlated while ratio above 2.00 assumed the presence of autocorrelation.
5. **Regression coefficient:** This measures the extent in which the predictor variables affect the dependent variables in the study.
6. **Probability Ratio:** It measures also the extent in which the predictor variables can explain change to the dependent variables given a percentage level of significant.

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

$$PLP_{it} = f(\beta_1 CM + \beta_2 CP + \beta_3 ILP + \varepsilon_{it}$$

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 assumed 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:

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

The regression of total samples can be expressed as:[1]

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

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) analysed whether the independent variables affect the dependent variable, this regresses the effect of the independent variables on the dependent variables.

$$PLP_{it} = f(\beta_1 CM + \beta_2 CP + \beta_3 ILP + \varepsilon_{it}$$

$$4$$

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:

$$PLP_{it} = \sum_{j=1}^{N} \beta_0 + f(CM + \beta_2 CP + \beta_3 ILP + \varepsilon_{it} ..$$

$$5$$

If this is represented with random variables, then $\beta_{oj} = \overline{\beta}_0 + \mu_j$, which indicates that the difference occurs randomly, and the expectation value of β_{oi} is $\overline{\beta}_0^{\,5}$. \dots\dots\dots\dots(6)

Where

PLP = Performing loan portfolio proxy by log of performing loans

CA = credit Appraisal proxy by percentage of increase/ decrease in nonperforming loans

CM = Credit monitoring proxy by log loan loss provision

ILP = Internal lending policy proxy by dummy variable 1 for internal lending policy and 0 for non-internal lending policy.

A-Priori Expectations of the Variables

Model 2: $CM_{it} < 0$ $CA_{it}. > 0$ and $ILP_{it} > 0$

the model had performing loans of the commercial banks as the dependent variables, credit administration is expected to have a positive relationship with performing loans of the commercial banks.

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.

Pooled Regression

In testing pooled regression by using ordinary least squares (OLS) first as it is the simplest to do with panel data. We stipulated that the error term should be independently and normally distributed with zero mean and constant variance and more importantly must not correlated with the independent variables pooled OLS linear regression is given as follows:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{4it} + \beta_4 X_{5it} + U_{it}$$

7

Where Y_{it} is the dependent variable; β_0 is a constant term: X_1, to X_4, are the independent variables; $\beta_1\ to\ \beta_4$ are slope parameters: i...n refer to the cross-sectional units and t is the time period.

Redundant Fixed Effect Test

the study used redundant fixed effect test, also called likelihood ratio test, to test whether the data can simply be pooled and estimated using a standard ordinary least squares regression model or affixed effects panel regression approach can be employed. The fixed effects model is simply a linear regression model in which the intercept terms vary over the individual units' i.e.

$$y_{tt} = \alpha_j + x_{it}^{1}\beta + \varepsilon_{it} \quad \varepsilon_{it} \approx HD\left(0.\sigma^2\right)$$

Where it is usually assumed that all x_{it} are independent of all ε_{it} it can write this in the usual regression framework by including a dummy variable for each unit *i*n the model. That is

$$y_{t\,t} = \sum_{j=1}^{N} \alpha_j d_{ij} + x_{ij}\beta + \varepsilon_{it} \quad \varepsilon_{it}$$

9

Where $d_{ij} = 1$ if $i=$ j and 0 elsewhere. We thus have a set of *N*. dummy variables in the model. The parameters $\alpha_1 \ldots \alpha_N$ and β can be estimated by ordinary least squares.

The Random Effect Model

It is commonly assumed in regression analysis that all factors that affect the dependent variable, but that have not been included as repressors, can be appropriately summarized by a random error term.

In our case, this leads to the assumption that they α_t are random factors, independently and identically distributed over individuals. Thus we write the random effects model as

$$y_{it} = \mu + x_{it}\beta + x_{it}\beta + \alpha_i + \varepsilon_{it}$$

10

Where $\alpha_t + \varepsilon_{it}$ is treated as an error term consisting of two components: an individual specific component, which does not vary over time, and a remainder component, which is assumed to be uncorrelated over time. That is, all correlation of the error terms over time is attributed to the individual effects α_{it}. It is assumed that α_{it} and ε_{it} are mutually independent and independent of x_{js} (for all i and *s)*. This implies that the OLS estimator for $\mu\ and\ \beta$ from (10.15) is unbiased and consistent.

Granger Causality Test

This study tested for causality to examine the relationship between the variables. Although regression analysis deals with the dependence of one variable on other variables, it does not imply causation. Thus, Granger causality test helps in adequate specification of model. In Granger causality, test, the null hypothesis is that no causality between two variables. The null hypotheses is rejected if the probability of F* statistics given in the Granger causality result is less than 0.05. The pair-wise granger causality test is mathematically expressed as:

$$Y_t \pi_o + \sum_{i=1}^{n} x_1^{y} Y_{t-1} \sum_{i=1}^{n} \pi_1^{x} x_{t-1} + u_1$$

and

$$x_t dp_o + \sum_{i=1}^{n} dp_1^{y} Yt - 1 \sum_{i=1}^{n} dp1^{X} x_{y-1} + V_1$$

12

Where x_t and y_t are the variables to be tested white u_t and v_t are the white noise disturbance terms. The

null hypothesis $\pi_1^y = dp_1^y = 0$, for all I's is tested against the alternative hypothesis $\pi_1^x \neq 0$ and $dp_1^y \neq 0$. if the co-efficient of π_1^x are statistically significant but that of $dp1y$ are not, then x causes y. If the reverse is true then y causes x. however, where both co-efficient of π_1^x and dp_1^y are significant then causality is bi –directional.

Panel Data Co-Integration Test

A substantial number of these tests are based on testing for a unit root in the residuals of a panel co-integrating regression. The possibility of co- integration between the series from different alternative estimators is available. With different small and large sample properties (depending upon the type of asymptotic that is chosen).

$$y_{it} = \alpha_i + \beta_i x_{it} + \varepsilon_{it} \qquad \qquad 13$$

y_{it} Where both and x_{it} are integrated or order one. Co-integration implies that ε_{it} is stationary for each i. Homogeneous co-integration. In addition, requires that $\beta_I = \beta$If the co-integrating parameter is heterogeneous. And homogeneity is imposed. One estimate

$$y_{it} = \alpha_i + \beta_i x_{it} + \left[(\beta_i - \beta) x_{it} + \varepsilon_{it} \right] \qquad \qquad 14$$

And in general, the composite error term is integrated of order one even if ε_{it} is stationary. However, the problem estimator will also average over i, so that the noise in the equation will be attenuated. In many circumstances, when

Panel Unit Root

We noticed that it is necessary to examine the stationarity of data since the use of non-stationary data can lead to spurious regressions. Unit root tests such as DF test, ADF tests e.t.c, are weak and tend to accept the null hypothesis. Besides, individual unit root tests have limited power. Since we have panel data, Levin, Lin and Chu's (LLC) model is recommended as it allows for both entity-specific and time-specific effects. The null hypothesis is unit root exists, indicating the data is non-stationary. To introduce panel data unit root tests, consider the autoregressive model

$$y_{it} = \alpha_i + \gamma_i y_i t - 1 + \varepsilon_{it} \qquad \qquad 15$$

Which we can rewrite as

$$\Delta y_{it} = \alpha_i + \pi_i y_i t - 1 + \varepsilon_{it} \qquad \qquad 16$$

Where $\pi_i = \gamma_i - 1$. The null hypothesis that all series have a unit root then becomes $H_0 : \pi_i = 0$ for all i. a first choice for the alternative hypothesis is that all series are stationary with the same mean-reversion parameter, that is, $H_1 : \pi_i = \pi < 0$ for each country i, and is used in the approaches of models. The combined test statistics is given by:

$$P = -2\sum_{i=1}^{N} \log p_i$$

17

For fixed N, this test statistics will have a Chi-squared distribution with $2N$ degrees of freedom as $T \rightarrow \infty$,

RESULTS AND DISCUSSION OF FINDINGS

Table 1: Presentation of Panel Unit Root Test

Method: Series: PLP	Statistic	Prob.**	Cross-sections	Obs
Panel Unit Root at Levels				
Levin, Lin & Chu t*	-4.71770	0.0000	13	104
Im, Pesaran and Shin W-stat	-1.12077	0.1312	13	104
ADF - Fisher Chi-square	32.5198	0.1765	13	104
PP - Fisher Chi-square	23.5538	0.6015	13	117
Series: ILP				
Levin, Lin & Chu t*	5.1E+16	1.0000	13	104
Series: CM				
Levin, Lin & Chu t*	0.37418	0.6459	13	103
Im, Pesaran and Shin W-stat	0.81614	0.7928	13	103
ADF - Fisher Chi-square	16.4662	0.9243	13	103
PP - Fisher Chi-square	19.0100	0.8360	13	116
Series: D(CA)				
Levin, Lin & Chu t*	-6.55409	0.0000	13	90
Im, Pesaran and Shin W-stat	-3.48308	0.0002	13	90
ADF - Fisher Chi-square	61.8224	0.0001	13	90
PP - Fisher Chi-square	138.676	0.0000	13	103
Panel Unit Root at fist difference				
Series: D(PLP,2)				
Levin, Lin & Chu t*	-11.9900	0.0000	13	78
Im, Pesaran and Shin W-stat	-4.22593	0.0000	13	78
ADF - Fisher Chi-square	72.2587	0.0000	13	78
PP - Fisher Chi-square	132.403	0.0000	13	91
Series: ILP				
Levin, Lin & Chu t*	5.1E+16	1.0000	13	104
Series: D(CM,2)				

Levin, Lin & Chu t*	-7.78095	0.0000	13	77
Im, Pesaran and Shin W-stat	-3.17391	0.0008	13	77
ADF - Fisher Chi-square	60.3552	0.0002	13	77
PP - Fisher Chi-square	151.152	0.0000	13	90
Series: D(CA,2)				
Levin, Lin & Chu t*	-10.7899	0.0000	13	77
Im, Pesaran and Shin W-stat	-4.25877	0.0000	13	77
ADF - Fisher Chi-square	69.5765	0.0000	13	77
PP - Fisher Chi-square	159.505	0.0000	13	90

Source: Extract from E-view, 2021

The table above test panel unit root on the relationship between bank credit monitoring, credit appraisal and performing loan portfolio quoted commercial banks in Nigeria, from the table we can conclude that the results of panel unit root test (IPS test) reported support the hypothesis of a unit root in all variables across among the variables, as well as the hypothesis of zero order integration in first differences. Even at one per cent significance level, we found that all tests statistics in both with and without trends significantly confirm that all series strongly reject the unit root null at fist difference. Given the result of IPS test, it is possible to apply panel cointegration method in order to test for the existence of the stable long–run relation among the variables.

Table 2: Presentation of Multiple Regression Results

Variable	Coefficient		Std. Error	t-Statistic	Prob.
Pooled regression model					
ILP	-0.008897		0.158846	-0.056012	0.9554
CM	-0.034094		0.049907	-0.683142	0.4958
CA	0.006113		0.033100	0.184689	0.8538
C	6.187730		0.359264	17.22336	0.0000
R-squared	0.004574	Mean dependent var			6.010000
Adjusted R-squared	-0.019508	S.D. dependent var			0.873166
S.E. of regression	0.881642	Akaike info criterion			2.616690
Sum squared resid	96.38427	Schwarz criterion			2.705816
Log likelihood	-163.4681	Hannan-Quinn criter.			2.652902
F-statistic	0.189947	Durbin-Watson stat			0.627838
Prob(F-statistic)	0.903079				
Fixed regression model					
ILP	0.007859		0.108218	0.072624	0.9422
CM	-0.240232		0.061188	-3.926099	0.0001
CA	0.020846		0.024182	0.862069	0.3905
C	7.324754		0.388028	18.87687	0.0000
Effects Specification					
Cross-section fixed (dummy variables)					

R-squared	0.585928	Mean dependent var		6.010000
Adjusted R-squared	0.530472	S.D. dependent var		0.873166
S.E. of regression	0.598312	Akaike info criterion		1.927059
Sum squared resid	40.09342	Schwarz criterion		2.283563
Log likelihood	-107.3318	Hannan-Quinn criter.		2.071908
F-statistic	10.56563	Durbin-Watson stat		1.275746
Prob(F-statistic)	0.000000			

Random regression model

ILP	0.006146	0.108170	0.056814	0.9548
CM	-0.184199	0.055072	-3.344720	0.0011
CA	0.019067	0.023991	0.794768	0.4283
C	7.007335	0.389693	17.98167	0.0000

Effects Specification

			S.D.	Rho
Cross-section random			0.570746	0.4764
Idiosyncratic random			0.598312	0.5236

Weighted Statistics

R-squared	0.088137	Mean dependent var		1.903783
Adjusted R-squared	0.066076	S.D. dependent var		0.636264
S.E. of regression	0.614684	Sum squared resid		46.85174
F-statistic	3.995128	Durbin-Watson stat		1.085593
Prob(F-statistic)	0.009366			

Unweighted Statistics

| R-squared | -0.075946 | Mean dependent var | | 6.010000 |
| Sum squared resid | 104.1808 | Durbin-Watson stat | | 0.613959 |

Correlated Random Effects - Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	9.912816	3	0.0193

Source: Extract from E-view, 2021

The Hausman (1978) specification was used to determine the appropriate model on the relationship between credit monitoring, credit appraisal, internal lending policies and performing loans portfolio of quoted commercial banks in Nigeria. Table 2 shows Hausman specification test the model has the value of p= 0.0193, this shows fixed effect model is more appropriate, because the null hypothesis is accepted. Therefore, this includes insignificant P-value, Prob>chi2 larger than 0.05, then it is more suitable to use fixed effects.

The adjusted R^2 is 0.530472; this implies that 53per cent variations in the nonperforming loans can be accounted for by the independent variables. This means 53 per cent of variations in the performing loans portfolio of the quoted commercial banks are explained by exogenous variable. This showed

that the independent variable values have at 53 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 nonperforming loans. The F-statistics (Fisher statistics which is a measure of the overall goodness of fit of regression) of 10.56563 and probability of 0.000000 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 1.275746 further indicates that the regression equation is free from the problem of autocorrelation. Hence, the results can be relied upon to make meaningful inferences.

Furthermore, the beta coefficient of the variables, from the fixed effect results it evidence that internal lending policies and credit appraisal have positive relationship with performing loans portfolio while credit monitoring have negative relationship with performing loans portfolio of the commercial banks. The estimates model paved that the regression intercept is positive and significant which implies that holding other variables constant, performing loans portfolio of the commercial banks increases b 7.32units within the time scope of this study.

Table 3: Pedroni Residual Cointegration Test

Series: PLP ILP CM CA	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	-2.010161	0.0278	-2.574018	0.0150
Panel rho-Statistic	2.802111	0.0075	2.999837	0.0086
Panel PP-Statistic	1.078636	0.8596	0.717479	0.7635
Panel ADF-Statistic	1.192732	0.8835	-1.635654	0.0510
	Statistic	Prob.		
Group rho-Statistic	4.761868	0.0000		
Group PP-Statistic	1.655650	0.9511		
Group ADF-Statistic	-0.810141	0.2089		

Source: Extract from E-view, 2020

The table 3examined the presence of long run relationship between credit appraisal, credit monitoring, internal lending policies and performing loan portfolio of quoted commercial banks in Nigeria. Our results proved that the variables are integrated in the ode of I (1), Since the variables are found to be integrated in the same order I (1), we continue with the panel cointegration tests proposed by Pedroni (1999, 2004). Cointegrations are carried out for constant and constant plus time trend and the summary of the results of cointegrations analyses are presented in table 3. In constant level, we found that the seven statistics reject null hypothesis of no cointegration at the five per cent level of significance for the ADF statistic and group ρ –statistic, while the group –ADF is significant at one per cent level.

Table 4: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
ILP does not Granger Cause PLP	104	NA	NA
PLP does not Granger Cause ILP		NA	NA
CM does not Granger Cause PLP	103	2.65983	0.0350
PLP does not Granger Cause CM		0.15561	0.8561
CA does not Granger Cause PLP	103	1.61483	0.2042
PLP does not Granger Cause CA		3.34026	0.0395
CA does not Granger Cause CM	102	1.71980	0.1845
CM does not Granger Cause CA		1.24399	0.2928

Source: Extract from E-view, 2021

The objective of the above table was to determine the causal relationship between credit monitoring, credit appraisal and internal lending policies and performing loan portfolio of quoted commercial banks. As summarized in table 4, a unidirectional causal relationship has been found between credit monitoring and performing loan portfolio, a unidirectional causal relationship has been found between performing loan portfolio and credit appraisal indicator of the commercial banks which is significant at 5 per cent probability, because the p-value is < 0.05. The study found no the causality among the variables.

DISCUSSION OF FINDINGS

The estimated model found that the explanatory variables can explain 53 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 internal lending policies and credit appraisal have positive and significant relationship with performing loan portfolio of the commercial banks. The regression coefficient proved that a unit increase on the variables can lead to 0.07 and 0.02 units on the performing loan portfolio of the commercial banks. The finding confirms our expectation of the study as effective management of credit risk enhances lending ability of commercial banks. Theoretically the findings confirm the risk diversification theory and in line with risk management theory. Empirically, this finding confirm the findings of Macharia (2012) that non-performing loans, rate of loan repayment and operational expenses largely affect the profitability of the institutions and that non-performing loans and operational expenses have more significant effect than the rate of loan repayment that is achieved by the organization. Muasya (2013) that there is a significant negative relationship between credit risk management practices and loan losses in commercial banks in Kenya, Mutua (2014) that in view of risk analysis as a credit risk management practice in the bank the application of modern approaches to risk measurement.

However, the estimated regression model found that credit monitoring has negative and significant relationship with performing loan portfolio of the commercial banks. The regression coefficient justifies that cedi monitoring will reduce performing loan portfolio of the commercial banks by 0.24 per cent. The negative effect of credit monitoring on performing loan portfolio of the commercial banks contradict the a-priori expectations of the study and confirms the relevance of risk diversification. The negative findings of confirm the findings of Nkegbe and Yazidu (2015) whose study reported negative trend in bank performance and a positive relation between market of loan and bank performance, Nyong'o (2014) that credit risk management practices adopted by the banks influences the level of non-performing loans to a great extent and that risk identification, risk monitoring and risk analysis and appraisal would lead to decrease in non-performing loans, the findings contradict the findings of Olawale (2014) whose findings showed negative relationship but not significant between loan ratio and total advances in terms of deposits and further shown a significant negative relationship between nonperforming loans and advances rate and banks' profitability.

CONCLUSION AND RECOMMENDATIONS
Conclusion
The estimated regression model proved that 40.8 per cent variations in the performing loans can be accounted for by the independent variables. From the fixed effect results, it was evidenced that internal lending policies and credit appraisal have positive relationship with performing loans portfolio while credit monitoring have negative relationship with performing loans portfolio of the commercial banks. The study concludes from the findings that there is significant relationship between credit monitoring, credit appraisal, internal lending policies and commercial banks performing loan portfolio in Nigeria,

Recommendations
1. 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.
2. Conditions of borrowers should be considered in the process of credit appraisal and banks must endeavor to comply with both internal and external lending procedures as this will reduce the incidence of nonperforming loans. Most failed banks were victims of compromising of lending principles because loans that were granted with full knowledge of the violation of sound banking and credit risk principles are hardly repaid.
3. Loans ought to be made on the basis of sound collateral. Even though not a condition for sound lending, it could serve as a soft cushion for the recovery of nonperforming loans and regular regulatory supervision is imperative for sound banking. This will expose lapses of technical

incompetence on the part of management and enforce disclosure of vital information needed for the evaluation of the state of the bank.

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