

# CREDIT ADMINISTRATION AND SUB-STANDARD LOANS OF COMMERCIAL BANKS IN NIGERIA

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## ABSTRACT

*This study examined the effect of credit administration on the value of sub-standard loans of quoted commercial banks in Nigeria. Cross sectional data were sourced from financial statement of commercial banks and Central Bank of Nigeria Statistical bulletin from 2009-2018. Sub-standard 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. The study found that internal lending policies and credit appraisal have negative relationship with substandard loans portfolio while credit appraisal has positive relationship with substandard loans portfolio. The study found that 40.6 per cent variations in the substandard loans can be accounted for by the independent variables. From the findings, the study concludes that credit administration has significant relationship with loan portfolio of Nigeria commercial banks. The study recommends that there should be compliance from all Central Bank of Nigerian lending guidelines to avert the incidence of non-performing loans in Nigerian commercial banks. The management of commercial bank should formulate credit policies that will reduce the incidence of sub-standard loans among*

*commercial banks in Nigeria.*

Keywords: Credit Administration, Sub-Standard Loans, Commercial Banks, Credit Monitoring, Internal Lending Policy.

## INTRODUCTION

Credit administration is the oversight of all activities related to a bank's credit process ensuring the bank's largest balance sheet asset which is loan portfolio maintains its value. It comprises the entire credit process, policy/procedure, underwriting guidelines, application, underwriting-approval-documentation, booking, servicing, credit management, portfolio management, monitoring delinquencies which include overdrafts, problem credit management, regulatory reporting, regulatory compliance, assets and liability management and financial reporting (Johnson, 2014).

The risk management function in credit administration involves a continuous process, which is not a static exercise of identifying risks that is sometimes subject to quick and volatile changes. The identification of risks results in opportunities for portfolio growth and aid in avoiding unacceptable exposures for the institution. It is a subjective evaluation driven by the experience of the lending and credit policy management team of your financial institution. Effective credit risk management is achieved through comprehensive credit policy; augmented by supporting underwriting and portfolio management guidelines; implemented by qualified staff; executing efficient processes and procedures from application through payoff (Johnson, 2014).

One of the major problems confronting the banking industry today is the increasing incidence of loan defaults and consequent loan losses which manifested on the profitability and soundness of the banks. Sequel to increasing incidence of huge non-performing loans in the Nigerian banking industry, insider's abuses, management's competence have been called to question. Non-performing loans, it must be noted bad loans occur due to the inability of the bank's management to recover loans granted to customers, central bank lending guidelines and macroeconomic instability (CBN, 2014) for instance, some of the sectors mandated by CBN for deposit money banks to lend to is prone with credit risk. Bad loans do not only affect the profitability of deposit money banks but affects the banking system soundness and the effective financial intermediation that is required to achieve set macroeconomic goals.

There are many studies on the relationship between credit administration and the profitability of commercial banks in Nigeria (Kanu and Hamilton, 2014) but limited studies of citable significance that examine the effect of credit

administration on sub-standard loans in Nigerian commercial banks. From the above knowledge gap, this study examined the effect of credit administration on sub-standard loans of quoted commercial banks in Nigeria.

## LITERATURE REVIEW

### Theoretical Foundation

#### 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.

#### 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)

#### 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).

## Conceptual Review

### Credit Administration

Credit administration is a procedure 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 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. Firstly, 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 convey 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 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.

### Empirical Review

#### Nonperforming Loans of Commercial Banks

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.

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 strengthened in order to reduce the high level of non-performing loans in the banking sector of Nigeria.

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.

#### METHODOLOGY

The study employed the ex-post facto 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 analyze past trends and explain the relationship between the dependent and independent variables. The population of the study covered 24 reporting commercial banks to Central Bank of Nigeria. However, the sample size was 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.

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 ( $r^2$ ), the student T-test and F-test will be employed.

1. Coefficient of Determination ( $r^2$ ) Test –This measure 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**

$$SUBS_{it} = f(\beta_1 CM + \beta_2 CP + \beta_3 ILP + \epsilon_{it})$$

**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:

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

The regression of total samples can be expressed as:<sup>1</sup>

$$Y_{it} = \sum_{i=1}^N \beta_{oi} D_i + \beta_1 D_s + \beta_2 D_{ma} + \beta_3 S_1 + \beta_{oi} D_4 S_2 + \epsilon_{it} \dots \dots \dots (3)$$

The dummy variables are expressed as follows: if  $j = i$ , then  $D_i = 1$ ; otherwise,  $D_i = 0$ .<sup>2</sup>

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.

$$SUBS_{it} = f(\beta_1 CM + \beta_2 CP + \beta_3 ILP + \varepsilon_{it}) \quad 4$$

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:

$$SUBS_{it} = \sum_{j=1}^N b_0 + f(CM + b_2 CP + b_3 ILP + e_{it}) \quad 5$$

If this is represented with random variables, then  $b_{oj} = \bar{b}_0 + m_j$ , which indicates that the difference occurs randomly, and the expectation value of  $b_{oi}$  is  $\bar{b}_0$ . (6)

Where

SUBS = Sub-standard loan portfolio proxy by log sub- standard classified portfolio

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

$$CM_{it} < 0 \quad CA_{it} > 0 \quad \text{and} \quad ILP_{it} > 0$$

The model had sub-standard nonperforming loans of the commercial banks as the dependent variables, credit administration is expected to have a negative relationship with sub-standard nonperforming 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:

$$Y_{it} = b_0 + b_1 X_{1it} + b_2 X_{2it} + b_3 X_{4it} + b_4 X_{5it} + U_{it} \quad 7$$

Where  $Y_{it}$  is the dependent variable;  $b_0$  is a constant term;  $X_1$ , to  $X_4$ , are the independent variables;  $b_1$  to  $b_4$  are slope parameters;  $i \dots n$  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.

$$y_{it} = a_j + x_{it} b + e_{it} \quad e_{it} \gg HD(0, \sigma^2)$$

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

$$y_{it} = \sum_{j=1}^N a_j d_{ij} + x_{ij} b + e_{it} \quad e_{it}$$

Where  $d_{ij} = 1$  if  $i=j$  and 0 elsewhere. We thus have a set of  $N$  dummy variables in the model. The parameters  $a_1, \dots, a_N$  and  $b$  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 regressors, can be appropriately summarized by a random error term. In our case, this leads to the assumption that they  $a_i$  are random factors, independently and identically distributed over individuals. Thus we write the random effects model as

$$y_{it} = m + x_{it}b + x_{it}b + a_i + e_{it} \tag{10}$$

Where  $a_i + e_{it}$  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  $a_i$ . It is assumed that  $a_i$  and  $e_{it}$  are mutually independent and independent of  $x_{js}$  (for all  $i$  and  $s$ ). This implies that the OLS estimator for  $m$  and  $b$  from (10) 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:

$$Y_t \rho_o + \sum_{i=1}^n a_{i1}^y x_{t-1}^y Y_{t-1} \rho_1^x + \sum_{i=1}^n a_{i1}^x x_{t-1}^x + u_t \tag{11}$$

and

$$x_t \rho_o + \sum_{i=1}^n a_{i1}^y dp_1^y Y_{t-1} \rho_1^x + \sum_{i=1}^n a_{i1}^x dp_1^x x_{t-1}^x + V_t \tag{12}$$

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  $\pi_1^x$  are statistically significant but that of  $dp_1^y$  are not, then  $x$  causes  $y$ . If the reverse is true then  $y$  causes  $x$ . however, where both co-efficient of  $\pi_1^x$  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).

$$y_{it} = a_i + b_i x_{it} + e_{it} \quad 13$$

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

$$y_{it} = a_i + b_i x_{it} + [(b_i - b)x_{it} + e_{it}] \quad 14$$

And in general, the composite error term is integrated of order one even if  $y_{it}$  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

$$y_{it} = a_i + g_i y_{it-1} + e_{it} \quad 15$$

Which we can rewrite as

$$\Delta y_{it} = a_i + \rho_i y_{it-1} + e_{it} \quad 16$$

Where  $\rho_i = g_i - 1$  The null hypothesis that all series have a unit root then becomes  $H_0 : \rho_i = 0$  for all  $i$  a first choice for the alternative hypothesis is that all series are stationary with the same mean-reversion parameter, that is,

$$H_1 : \rho_i = \rho$$

$\rho = -1$  for each country  $i$ , and is used in the approaches of models. The

combined test statistics is given by:

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

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

### DATA ANALYSIS AND RESULTS

Table 1: Presentation of Panel Unit Root Test

| Method: Series: SSLP                               | Statistic | Prob.** | Cross-sections | Obs |
|--|-----------|---------|----------------|-----|
| Panel Unit Root at Levels                          |           |         |                |     |
| Null: Unit root (assumes common unit root process) |           |         |                |     |
| Levin, Lin & Chu t*                                | -8.30315  | 0.0000  | 13             | 104 |
| Im, Pesaran and Shin W -stat                       | -3.98841  | 0.0000  | 13             | 104 |
| ADF - Fisher Chi-square                            | 67.2322   | 0.0000  | 13             | 104 |
| PP - Fisher Chi-square                             | 74.1379   | 0.0000  | 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: CA   |           |         |                |     |
| Levin, Lin & Chu t*                                | -5.09689  | 0.0000  | 13             | 103 |
| Im, Pesaran and Shin W -stat                       | -2.66156  | 0.0039  | 13             | 103 |
| ADF - Fisher Chi-square                            | 51.2266   | 0.0022  | 13             | 103 |
| PP - Fisher Chi-square                             | 94.9225   | 0.0000  | 13             | 116 |
| Panel Unit Root at First Difference                |           |         |                |     |
| Series: D(SSLP,2)                                  |           |         |                |     |
| Levin, Lin & Chu t*                                | -14.9709  | 0.0000  | 13             | 78  |
| Im, Pesaran and Shin W -stat                       | -6.26243  | 0.0000  | 13             | 78  |
| ADF - Fisher Chi-square                            | 90.2391   | 0.0000  | 13             | 78  |
| PP - Fisher Chi-square                             | 178.912   | 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)

|                              |          |        |    |     |
|------------------------------|----------|--------|----|-----|
| 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 |

Source: Extract from E-view, 2021

The table 1 tests panel unit root on the relationship between bank credit monitoring, credit appraisal and sub-standard 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.    |
|---------------------------------------|-------------|-----------------------|-------------|----------|
| <b>Pooled regression model</b>        |             |                       |             |          |
| ILP                                   | 0.028623    | 0.310456              | 0.092198    | 0.9267   |
| CM                                    | 0.326143    | 0.097541              | 3.343664    | 0.0011   |
| CA                                    | 0.024553    | 0.064692              | 0.379535    | 0.7049   |
| C                                     | 2.994200    | 0.702162              | 4.264260    | 0.0000   |
| R-squared                             | 0.083414    | Mean dependent var    |             | 5.031094 |
| Adjusted R-squared                    | 0.061239    | S.D. dependent var    |             | 1.778436 |
| S.E. of regression                    | 1.723121    | Akaike info criterion |             | 3.956903 |
| Sum squared resid                     | 368.1742    | Schwarz criterion     |             | 4.046029 |
| Log likelihood                        | -249.2418   | Hannan-Quinn criter.  |             | 3.993115 |
| F-statistic                           | 3.761559    | Durbin-Watson stat    |             | 0.290771 |
| Prob(F-statistic)                     | 0.012603    |                       |             |          |
| <b>Fixed regression model</b>         |             |                       |             |          |
| ILP                                   | -0.028782   | 0.144612              | -0.199026   | 0.8426   |
| CM                                    | -0.060521   | 0.081766              | -0.740171   | 0.4607   |
| CA                                    | 0.060366    | 0.032314              | 1.868107    | 0.0644   |
| C                                     | 5.135448    | 0.518524              | 9.903975    | 0.0000   |
| Effects Specification                 |             |                       |             |          |
| Cross-section fixed (dummy variables) |             |                       |             |          |
| R-squared                             | 0.821760    | Mean dependent var    |             | 5.031094 |
| Adjusted R-squared                    | 0.797889    | S.D. dependent var    |             | 1.778436 |
| S.E. of regression                    | 0.799527    | Akaike info criterion |             | 2.506876 |

|   |           |                      |                    |
|---|-----------|----------------------|--------------------|
| Sum squared resid                               | 71.59532  | Schwarz criterion    | 2.863380           |
| Log likelihood                                  | -144.4401 | Hannan-Quinn criter. | 2.651726           |
| F-statistic                                     | 34.42449  | Durbin-Watson stat   | 1.174207           |
| Prob(F-statistic)                               | 0.000000  |                      |                    |
| <b>Random regression model</b>                  |           |                      |                    |
| ILP   | -0.027354 | 0.144598             | -0.189174 0.8503   |
| CM  | -0.031556 | 0.079695             | -0.395954 0.6928   |
| CA  | 0.059428  | 0.032257             | 1.842353 0.04478   |
| C   | 4.991013  | 0.690235             | 7.230892 0.0000    |
| Effects Specification                           |           |                      |                    |
|   |           |                      | S.D. Rho           |
| Cross-section random                            |           |                      | 1.680157 0.8154    |
| Idiosyncratic random                            |           |                      | 0.799527 0.1846    |
| Weighted Statistics                             |           |                      |                    |
| R-squared                                       | 0.529596  | Mean dependent var   | 0.755819           |
| Adjusted R-squared                              | 0.406119  | S.D. dependent var   | 0.804226           |
| S.E. of regression                              | 0.800070  | Sum squared resid    | 79.37383           |
| F-statistic                                     | 4.260625  | Durbin-Watson stat   | 1.034095           |
| Prob(F-statistic)                               | 0.000909  |                      |                    |
| Unweighted Statistics                           |           |                      |                    |
| R-squared                                       | 0.327925  | Mean dependent var   | 5.031094           |
| Sum squared resid                               | 412.8969  | Durbin-Watson stat   | 0.272995           |
| <b>Correlated Random Effects - Hausman Test</b> |           |                      |                    |
| Test Summary                                    |           | Chi-Sq. Statistic    | Chi-Sq. d.f. Prob. |
| Cross-section random                            |           | 3.170254             | 3 0.3661           |

Source: Extract from E-view, 2020

The Hausman (1978) specification was used to determine the appropriate on the relationship between credit monitoring, credit appraisal, internal lending policies and sub-standard loans portfolio of quoted commercial banks in Nigeria. Table 2 shows Hausman specification test the model has the value of  $p=0.3661$  for the regression model of dependent and independent variables. This shows random effect model is more appropriate, because the null hypothesis is accepted. 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  $R^2$  is 0.406119; this implies that 40.6 per cent variations in the substandard loans can be accounted for by the independent variables. This means 59.4 per cent of variations in the substandard loan's portfolio of the quoted commercial banks are explained by exogenous variable. This showed that the independent variable values have at 40.6 per cent significant influence on substandard loans portfolio of the commercial banks. This also indicates that there are other variables that influence the variations in the level of substandard loans portfolio. The F-statistics (Fisher statistics which is a measure of the

overall goodness of fit of regression) of 4.260625 and probability of 0.000909 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 random effect results it evidence that internal lending policies and credit appraisal have negative relationship with substandard loans portfolio while credit appraisal have positive relationship with substandard 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, substandard loans portfolio of the commercial banks increases b 4.99 units within the time scope of this study.

Table3: Pedroni Residual Cointegration Test  
Series: SSLP ILP CM CA

|                     | <u>Statistic</u> | <u>Prob.</u> | <u>Statistic</u> | <u>Prob.</u> |
|---------------------|------------------|--------------|------------------|--------------|
| Panel v-Statistic   | -1.828991        | 0.9663       | -<br>2.319038    | 0.0398       |
| Panel rho-Statistic | 3.124887         | 0.0091       | 2                | 0.0078       |
| Panel PP-Statistic  | 1.077595         | 0.8594       | -<br>0.199859    | 0.4208       |
| Panel ADF-Statistic | -1.579394        | 0.0571       | -<br>2.752933    | 0.0030       |
|                     | <u>Statistic</u> | <u>Prob.</u> |                  |              |
| Group rho-Statistic | 4.638268         | 0.0000       |                  |              |
| Group PP-Statistic  | -1.488264        | 0.0683       |                  |              |
| Group ADF-Statistic | -3.846057        | 0.0001       |                  |              |

Source: Extract from E-view, 2020

The table 3 examined the presence of long run relationship between credit appraisal, credit monitoring, internal lending policies and substandard 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 4.23. 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 P –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 SSLP | 104 | NA          | NA     |
| SSLP does not Granger Cause ILP |     | NA          | NA     |
| CM does not Granger Cause SSLP  | 103 | 0.11432     | 0.8921 |
| SSLP does not Granger Cause CM  |     | 0.06576     | 0.9364 |
| CA does not Granger Cause SSLP  | 103 | 1.62177     | 0.2028 |
| SSLP does not Granger Cause CA  |     | 0.12506     | 0.8826 |
| 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, 2020

The objective of the above table was to determine the causal relationship between credit monitoring, credit appraisal and internal lending policies and substandard loan portfolio of quoted commercial banks. As summarized in table 4, the results indicate no causal relationship between the variables in the model.

#### DISCUSSION OF FINDINGS

After cross examination of the fixed and the random effect regression models, the study adopted the random effect model in analyzing the relationship between the independent variable and the dependent variables as formulated in the regression model. The estimated model found that the explanatory variables can explain 40.6 per cent variations on the sub-standard 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 monitoring have negative and no significant relationship with sub-standard loan portfolio of the commercial banks.

The regression coefficient proved that a unit increase on the variables can lead to 0.002 and 0.03units decrease on sub-standard loan portfolio of the commercial banks. Unlike the findings above, the finding confirms our expectation of the

study as effective management of credit risk reduces the incidence of sub-standard loans of commercial banks. The negative effect of the variables can be traced to effective credit risk management strategies. Theoretically the findings confirm the risk diversification theory and in line with risk management theory. Empirically, this finding contradicts 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 sub-standard 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 appraisal has positive and significant relationship with sub-standard loans portfolio of the commercial banks. The regression coefficient justifies that credit appraisal will increase sub-standard loans portfolio of the commercial banks by 0.05 per cent. The positive effect of credit appraisal on sub-standard loans portfolio of the commercial banks contradicts the a-priori expectations of the study and contradicts the relevance of risk diversification and risk management theory. Unlike the findings above, the positive findings of the variable 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

The study found that 40.6per cent variations in the substandard loans can be accounted for by the independent variables while 59.4 per cent of variations in the substandard loans' portfolio of the quoted commercial banks are explained by exogenous variable. From the random effect results it evidenced that internal lending policies and credit appraisal have negative relationship with

substandard loans portfolio while credit appraisal have positive relationship with substandard loans portfolio of the commercial banks. The study also concludes from the findings that there is significant relationship between credit monitoring, credit appraisal, internal lending policies and commercial banks sub-standard loan portfolio in Nigeria. The study thus recommends that:

1. There should be compliance from all Central Bank of Nigerian lending guidelines to avert the incidence of non-performing loans in Nigerian commercial banks. The management of commercial bank should formulate credit policies that will reduce the incidence of sub-standard loans among commercial banks in Nigeria.
3. The Central Bank of Nigeria should ensure strict compliance to prudential guidelines as issued in 1990 and reformed in 2010. A 1 1 lending to some sectors of the economy such as the small and medium scale enterprises should be properly monitored and followed up by the credit department of the commercial banks to leverage the incidence of non-performing loans. The lending policies of the central bank of Nigeria should be harmonized with the credit management objectives of the commercial banks.

#### REFERENCES

- Abdulraheem, A., Yahaya, K. A., & Aliu, O. A. (2015). Determinants of performance: A cross generational analysis of Nigerian banks. *European Journal of Social Sciences*, 24(4), 458 – 465.
- Adebawo, O. O. & Enyi, P. E. (2014). Impact of credit risk exposure on the market value of Nigerian banks (2006-2012). *American International Journal of Contemporary Research*, 4(10), 59 – 69.
- Aduda, J., & Gitonga, J. (2011). The Relationship between Credit Risk Management and Profitability Among the Commercial Banks in Kenya, *Journal of Modern Accounting and Auditing*, 7 (9), 934-946.
- Ahmad, N. H., & Ariff, M. (2017). Multi-country study of bank credit risk determinants. *International Journal of Banking and Finance*, 5(1), 135 – 152.
- Ahmed, S. F. & Malik, Q. A. (2015). Credit risk management and loan performance: empirical investigation of micro finance banks of Pakistan. *International Journal of Economics and Financial Issues*, 4(2)90-100.
- Ali, S. A. (2015). The effect of credit risk management on financial performance of the Jordanian commercial banks. *International Research Journal of Finance and Economics*, 1(1), 348-367.
- Alshatti, A. S. (2015). The effect of credit risk management on financial

- performance of the Jordanian commercial banks. *Investment Management and Financial Innovations Journal*, 12(1), 338 – 345.
- Aluko, F. & Arowolo, D. (2015). Foreign aid, the third world's debt crisis and the implication for economic development: The Nigerian Experience, *African Journal of Political Science and International Relations*, 4(4), 120 - 127.
- Aremu, O. S, Suberu, O. J. & Oke, J. A. (2016). Effective credit processing and administration as a panacea for non-performing assets in the Nigerian banking system. *The Journal of Economics*, 1(1), 53-56
- Chen, K. & Pan, C. (2016). An empirical study of credit risk efficiency of banking industry in Taiwan. *Journal of Chinese Management Review*, 15(1), 1 - 16.
- Chen, R. R., Cheng, X. & Wu, L. (2015). Dynamic interactions between interest rate, credit and liquidity risk, theory and evidence from term structure of credit default swap spreads. Working Paper series.
- Elisa, M. & Guido, P. (2016). Factors affecting bank profitability in Europe: An empirical investigation. *African Journal of Business Management*, 10(17), 410-420.
- Etale, L. M, Ayunku, P. E. & Etale, E. L. (2016), The impact of non-performing loans on bank performance in Nigeria. *Journal of Humanities and Social Science Invention*, 5(4), 01 – 05.
- Ezirim, B. C. & Emenyonu, E. N. (1998). *Bank Lending and Credit Administration. A Lender's perspective with cases and suggested solutions*. Port Harcourt: Markowitz Centre for Research and Development.
- Gakure, R. W., Ngugi, J. K., Ndwiga, P. M. & Waithaka, S. M. (2012). Effect of credit risk management techniques on the performance of unsecured bank loans employed commercial banks in Kenya. *International Journal of Business and Social Research*, 2(4), 221-236.
- Haneef, S., Riaz, T., Ramzan, M., Rana, M. A. Ishaq, H. M. & Karim Y. (2012). Impact of risk management on nonperforming loans and profitability of banking sector of Pakistan. *International Journal of Business and Social Science* 3(7), 78-90.
- Johnson, J. W. (2014). Washington Bankers Association Credit and Risk Review Executive Development Program.
- Kanu, C., & Hamilton, O. I. (2014). The rising incidence of nonperforming loans and the nexus of economic performance in Nigeria: An investigation. *European Journal of Accounting, Auditing and Finance Research*, 2(5), 87-96.
- Kolapo, T. F., Ayeni, R., Kolade, O., and Ojo, M., (2012). Credit risk and

- commercial banks' performance in Nigeria: a panel model approach. *Australian Journal of Business and Management Research*, 2(2), 31-38.
- Loizis, D. (2010). The determinants of nonperforming mortgage, business and consumer loans in Greece. Athens, Published Thesis (MSc), Athens University.
- Markowitz, H. (1952). Portfolio selection. *The Journal of Finance*, 7(1), 77-91.
- Olalere, O. E. & Ahmad, W. O. (2015). The empirical effects of credit risk on profitability of commercial banks: Evidence from Nigeria. *International Journal of Science and Research*, 5(1), 1645-1650.
- Olawale, S. R. (2014). Corporate social responsibility and business ethics: Effective tools for business performance in Nigeria banks. *Interdisciplinary Journal of Contemporary Research Business*, 4(5), 274-279.
- Olweny, T. & Shipho, T. M. (2011). Effects of banking sectoral factors on the profitability of commercial banks in Kenya. *Economics and Finance Review*, 1(5), 1-30.29.
- Olweny, T. & Shipho, T. M. (2011). Effects of banking sectoral factors on the profitability of commercial banks in Kenya. *Economics and Finance Review*, 1(5), 1-30.29.
- Onaolapo, A. R. (2012). Analysis of credit risk management efficiency in Nigeria commercial banking sector (2004-2009). *Far East Journal of Marketing and Management*, 2(1), 90-103.
- Shingjergji, A. (2013). The impact of bank specific variables on the non-performing loans ratio in the Albanian banking system. *Research Journal of Finance and Accounting*, 4(7), 148-152.
- Singh, A. (2013). Credit risk management in Indian commercial banks. *International Journal of Marketing, Financial Services & Management Research*, 2(7), 47-51.
- Somoye, R. O. C. (2018). The performance of commercial banks in post-consolidation period in Nigeria: An empirical review. *European Journal of Economics, Finance and Administrative Sciences*, 14(14), 62-73.
- Tetteh, F. L. (2012). Evaluation of credit risk management practices in Ghana commercial bank limited. Masters Dissertation, Institute of Distance Learning, Kwame Nkrumah University of Science and Technology.
- Wangai, D. K. (2014). Impact of non-performing loans on financial performance of microfinance banks in Kenya: A Survey of Microfinance Banks in Nakuru Town. *International Journal of Science and Research*, 3(10), 2073-2078.