Liquidity of Mortgage Collaterals and Non-Performing Loans Effects in Nigerian Deposit Money Banks

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ABSTRACT
The study evaluated the liquidation of equitable mortgage collateral and its effect on non-performing loans of deposit money banks in Nigeria over the period of 1981 to 2020, secondary data were collected from the Central Bank of Nigeria Statistical Bulletin. Analytical techniques include stationarity, Johansen's co-integration, error correction estimations and Granger causality tests. One-year lag length was determined as most appropriate for the collateral types. The sub-standard loans model showed that equitable mortgage collateral liquidation is statistically valuable in determining Nigerian Deposit Money banks' non-performing loans but failed in terms of Deposit Money banks' doubtful loans and lost loans as non-performing loans indicator in Nigerian banks. The Granger causality test results indicated that equitable mortgage valuably promote sub-standard loans in Nigerian bank but failed in light of the other non-performing loans. In light of these findings, the study recommended that;Only marketable equitable mortgage assets should be accepted for loan purposes banks should make proactive provisions for losses for non-performing loans before they crystallize. The study also suggeststhirty days as against the current ninety days by Prudential guidelines against loan loss provision. Also, the Central Bank of Nigeria should set a write off policy for banks to declassify non-performing loans with one-hundred percent provision from the statement of financial position within four years. This is to ensure transparency of financial information to users.
Keywords: Mortgage collateral, liquidity, non-performing loan, deposit money banks.

I. INTRODUCTION

Collateral is an item of value used to secure a loan. Collateral minimizes the risk for lenders. If a borrower defaults on the loan, the lender can seize the collateral and sell it to recoup its losses. Mortgages and car loans are two types of collateralized loans . Collateral is any property or asset that is given by a borrower to a lender in order to secure a loan . (Alihodžić & Ekşi, 2018; Abah &Naankiel, 2016). Over the past decade, the credit quality of the loan portfolios among most of the countries in the world remained relatively stable until the financial crisis hit the global economy in 2007-2008 (Vouldis&Lousiz, 2010).

Nigerian banks give loans to qualified borrowers with the expectation that they will earn interest income at the agreed interest rate and to be liquidated at an agreed date. Non-performing loans normally start as performing loans, whereby the borrower has been meeting the terms and conditions of the loan contract. However due to some reasons which include poor credit risk management, high interest rate among other reasons, borrowers begin to default in their loan repayment. In the Promise to Pay model designed by Grainger (2009), four types of borrowers were identified and must be known by all the banks. The first set of borrowers are willing and able to pay. The second set of borrowers are willing but unable to pay. The third set of borrowers are unwilling but able to pay and the fourth set of borrowers are unwilling and unable to pay. Banks should identify this last set of borrowers and develop effective strategy to manage their credit risk. It will be a waste of useful time and bank resources to manage the credit risk from this class of borrowers. This is therefore based on the promise to pay model. A promise to pay agreement is a promissory note, that details the amount of debt outstanding, the conditions under which the money will be repaid, the interest rate, and what will happen if the money is not repaid in a timely manner(Kjosevski&Petkovski, 2017).Non-performing loan repayment is a concern to banks. When the number of days loan repayment and

interest payment are overdue by 90 days and above, they begin to attract serious attention from management and from regulatory authorities. Non-performing loans are now a global problem(Central Bank of Nigeria statistical bulletin, 2018).

Non-performing loans can be secured with Equitable Mortgage or with Fixed and Floating charges. However, these collaterals are considered weak. Their weakness is traceable to the lengthy legal process banks have to endure to convert them to cash. Secondly, the outcome of the legal process is unpredictable. Sometimes due to technicalities, banks lose good cases. Thirdly, the legal process is an expensive burden for banks to bear. The professional fees paid for legal services and for the valuation of the borrowers assets constitute significant portion of their operating expenses. Fourthly, there are no ready markets for the sale of collateral assets. As a result, buyers offer ludicrous low prices to purchase the collaterals that have deteriorated in value through the passage of time, wear and tear from environmental factors among other reasons.The accounting implications of securing non-performing loans with these weak collaterals are that the banks are not liquid because of poor sales proceeds from the collaterals. Banks cannot comfortably meet their financial obligations to their vendors, pay staff salaries as at when due among other problems. Above all, because of liquidity problems banks find it difficult to give out more loans to borrowers, which is a major source of their income.

In summary, there are strong collaterals and there are weak collaterals. From the merits and the demerits of the collaterals mentioned above, it is the duty of banks to decide on which collaterals meet their requirements. While strong collaterals promote high liquidity due to full recovery of non-performing loans, the provisions for future losses are low. Weak collaterals frustrate banks with low liquidity, high provision for future losses with uncertainties that could lead to their eventual collapse. The nature of non-performing loans in Nigerian banks has been introduced in this study with discussions on interest income recognition under accrual basis, its implications and suspension when payments are overdue for more than 90 days and the substitution of cash basis in its stead. There is also classification into three groups and provisioning for their future losses. Non-performing loans are all collateralised. Those secured with strong collaterals are recoverable, while those secured with weak collaterals will be difficult to recover and some of them may be written off.

Based on the aforementioned, Bloem and Gorter (2001) stressed that the causes of non-performing loans are entirely based on credit management practices and collateral might be the needed cure. They opined that bank credit officials do not properly assess the sustainability of granting credit to their customers. They further observed that credit officers do not adhere to good lending principles. All the affected banks show similar symptoms such as insider abuse, poor monitoring of loan accounts, lack of qualified staff, little or no cash flow appraisal of loan requests, which all can be avoided with the implementation of a strong collateral system. This study, therefore, seeks to address the situation and re-examine the influence of collaterals on non-performing loans and its implications for credit risks management in Nigerian banks.

Banks must identify each non-performing loan for the purpose of monitoring, control, recovery or write off. The Prudential Guideline direct banks to classify each non-performing loan according to the established criteria. Classification is a reflection of the level of risk associated with each class. However, collaterals play significant role in determining the provision for future losses on non-performing loans. Low quality collaterals will require high provisions, while high quality collaterals will require low provision. But most banks are not able to make high provisions because the level of income earned is inadequate. Correspondingly, most statements of financial position are not realistic because not enough provisions were made. Theoretically, the higher the provisions for non-performing loan losses, the lower the value of the non-performing loan and the lower the statement of financial positions strength but this is not the case. Conversely, the lower the provision for losses due to high quality of the collateral, the higher the value of the non-performing loan in the statement of financial position and the stronger is the strength of the statement of financial position.

In summary, it is the continuous default of most Nigerian banks to adopt international best practices that has compounded the problem of non-performing loan. The acceptance of weak collaterals from borrowers, the inappropriate classification of non-performing loans and the inadequate provision for losses, and the confusion created by accrual basis of interest income recognition are some of the factors inhibiting non-performing loan recovery.In the light of the aforementioned, the study seeks to determine the nature and direction of the relationship between

collateral and non-performing loans of deposit money banks in Nigeria.

The aim of the study is to examine the nexus between collaterals and non-performing loans in Nigerian banks. The specific objectives are to:
  i. evaluate the nature of relationship betweenequitable mortgageandsub-standard loansin Nigerian banks.
  ii. evaluate the effect of equitable mortgage on doubtful loansin Nigerian banks.
  iii. appraise the nature of the effect of equitable mortgage on lost loansin Nigerian banks.

Firstly, policy makers are hoped to benefit from the results of this study as they will enhance understanding and formulation of policies that will enable collected collateral types to be deployed strategically towards uplifting loan performance standardsin Nigerian banks. Further, an objective determination of sensitivities of non-performing loans indicators to collaterals resources will hopefully assist Nigerian Deposit Money banks'financial managers to adopt steps towards employment of the realized collateral types in loan-loss reduction especially when there are improved collections and rational operational activitiesin order to meet and possibly exceed the Basel standards stipulated for bank liquidity and profitability management.

This research exercise is organized in five sections. Section one introduces the background of the study, statement of the problem, the aim and objectives of the study, research hypotheses, research questions, scope, the significance of the study and the organization of the study. Section two reviews the related literature of the study to situate the conceptual, theoretical and empirical framework and identify any perceived gap in literature. Section three examines the methodology of study, which comprises the sources of data collection, model specification and the method of data analysis of the study. Section four deals with the data presentation, analysis, test of hypothesis and discussion of findings. Section five ends the study with a summary of findings, limitations of the study, conclusion,recommendations, and contribution to knowledge.

II. LITERATURE REVIEW
2.1 Theoretical/Conceptual Framework
2.1.1 Mortgage/Real Estate Collateral
The most common type of collateral used by borrowers is real estate, such as one's house or a parcel of land. Such properties come with a high value and low depreciation. However, it can also be risky because if the property is seized or

sequestered due to a default, it cannot any longer be taken back (Coco, 2000).
2.1.2 The Concept of Non-performing loan
Loans: In its general term a loan is a written or oral agreement for a temporary transfer of a property (usually cash) from its owner (the lender) to a borrower who promises to return it according to the terms of the agreement, usually with interest for its use. However, in the ambience of banking upon which our research is based, a loan is regarded as money which is borrowed from a lending institution or a government agency and repaid at a future date. According to Onyiriuba (2009) a loan is money that a bank lets a borrower to have the use of as a credit facility on condition that they pay it back with interest to the bank at an agreed future date.According to Onyeagocha (2001), the term credit is used specifically to refer to the faith placed by a creditor (lender) in a debtor (borrower) by extending a loan usually in the form of money, goods or securities to debtors. Essentially, when a loan is made, the lender is said to have extended credit to the borrower, and he automatically accepts the credit of the borrower. Credit can therefore be defined as a transaction between two parties in which the creditor or lender supplies money, goods and services or securities in return for promised future payments by the debtor or borrower.

Loans are generally repaid according to pre-agreed terms of agreement as detailed in the repayment schedule which states the amount of principal and interest that are due during the tenor of the loan. If the loan is repayable on the demand of the lender, it is called a demand loan. If the loan is repayable in equal monthly installments (EMI), it is referred to as an installment loan. If repayable is in lump sum at the loan's maturity (expiration) date, it is a time loan. Banks further classify their loans according to the assets financed such as consumer loan for consumer items. Others are commercial, industrial, construction, personal or mortgage. Further loan classification could be secured or unsecured depending on whether they were properly backed by collateral.
2.2 Theoretical Framework
This section clarifies related theories underpinning non-performing loans and Collaterals.
2.2.1 Procyclical Theory of Bank Lending
Procyclicality refers to the interactions between the financial system and the real economy which are mutually reinforcing. Such interactions tend to amplify the amplitude of the business cycle, thereby heightening the risk to financial stability. A procyclical lending and risk-taking response by banks has been explained on various theoretical

grounds: First, such responses can be on account of 'herd behaviour' by banks. Rajan (1994) argues that banks are rational agents but are driven by two short-term concerns: earnings and reputation. Hence, they tend to herd their peers in terms of lending with the comfort that they would not severely under-perform even if the credit cycle busts. In the process, however, they tend to follow a more liberal credit policy by extending the terms of loans and weakening credit covenants, thus explaining the procyclicality in risk-taking as explained by Chavan and Gambacorta (2016).

2.2.2 Cognitive Bias of Lending

Secondly, the literature also discusses various cognitive biases afflicting banks. First, 'disaster myopia' or short-sightedness in underestimating the likelihood of high loss low-probability events is one such bias (Guttentag & Herring, 1986). Although banks can mitigate this risk by investing adequately in information about market conditions and borrowers, their myopia often inhibits them from making such an investment. The second cognitive bias relates to 'cognitive dissonance', wherein banks do have the necessary information at their disposal but tend to interpret it in a biased way, reinforcing their existing beliefs about market conditions. Borio et al., (2001) argue that such biases give rise to misperceptions about prevailing risks leading to a more procyclical risk-taking response by banks.

2.3 Empirical Review

This section reviews relevant and related studies as to the subject matter towards knowing the consensus of scholars as to the existent interrelationship of study variables over time and are arranged chronologically as follows:

Alihodžić and Ekşi (2018) evaluated factors that affect the credit growth rate of some Western Balkan countries (Bosnia and Herzegovina, Croatia and Serbia) and the credit policy in Turkey will be investigated through a multiple regression analysis. The credit growth rate will be used as the dependent variable while the rate of the non-performing loans along with the growth rate of the deposit, the return of equity and the real growth rate of the gross domestic product will be used as independent variables. In this paper the STATA 13.0 software package will be used. This data analysis will include a quarterly basis data for the period: 2007q1 – 2017q2 due to its higher significance. The result of the regression analysis showed that there is a reverse relationship between the rate of the non-performing loans and the credit growth rate for all the observed countries. The high share of problematic loans in total loans relatively reflects in a negative way the overall

tendency of the banks towards taking risks and credit growth. It reduces the profitability of the banking sector and increases the systemic risk as well. The basic results of the regression analysis also showed a positive relationship between economic growth and the credit growth of banks. On the one hand, the economic growth of the region insufficiently follows the credit growth due to the stagnation of the real sector, and the recovery of the economy on the other hand. Similarly, there is a positive relationship between the growth rate of the deposits and credit growth, since the deposits sources are the basis for performing credit nomination. Except for Croatia where a negative correlation was recorded, there is a positive relationship in terms of the return on equity and credit growth.

Atoi (2018) examined non-performing loan and its effects on the stability of Nigerian banks with national and international operational licenses from 2014:Q2 to 2017:Q2. A "restricted" dynamic GMM is employed to estimate the macroeconomic and bank specific drivers of non-performing loans for each licensed category. Z-Score is constructed to proxy banking stability, and its response to shocks. Non-performing loans are examined in a panel vector autoregressive framework. The results reveal that drivers of non-performing loans vary across the two categories of banks, but weighted average lending rate is a vital macroeconomic driver of non-performing loans for both. The results also confirm the moral hazard hypothesis and riskreturn tradeoff of efficient market theory. Furthermore, international banks withstand non-performing loan shocks in the long run, despite temporary flux in the short horizon, while the stability of national banks is susceptible to non-performing loans shocks in the long run. The study recommends that weighted average lending rate, anchored on monetary policy rate should be the focus of banks' regulators when addressing issues of non-performing loans.

Kingu, Macha and Gwahula (2018) examined the impact of non-performing loans on banks' profitability using information asymmetry theory and bad management hypothesis. This study adopted causality research design using panel data (2007 to 2015) of 16 commercial banks in Tanzania. The study employed Descriptive statistics and multiple regression analysis estimation methods. Likewise, Ordinary Least-Squares (OLS) regression technique was also used, and then Fixed Effects (FE) and Random Effects (RE) assumptions were considered. The study found that occurrence of non-performing loans is negatively associated with the level of profitability

in commercial banks in Tanzania. The results extend further the information asymmetry theory and bad management hypothesis. The findings of the study have both theoretical and managerial implications for practitioners and policy-makers.

John (2018) identifies the cause and effect relationships between the non-performing loan and its determinants. Two commercial banks in Nigeria were sampled judgmentally. This study used secondary sources of data, which are panel data in nature, over the period 2010-2015. These data were collected from Annual statement of account and CBN statistical bulletins. The study found that GDP ratio had positive relationship with ROA, whereas exchange rate as well as unemployment rate had negative relationship with ROA. The study, therefore, recommended that the government should maintain political stability and combat corruption at all levels, banks should have a good track of their customers regarding loans repayment and lastly, banks should employ sustainable manpower.

Etale, Ayunku and Etale (2016) 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.

Ozurumba (2016) examined the impact of non-performing loans on the performance of selected commercial banks in Nigeria covering the period 2000 - 2013 with special emphasis on Access Bank, United Bank for Africa and Union Bank of Nigeria Plc. It specifically determined the effect of non-performing loans, provision for loan loss and loans and advances on the performance of banks measured by Return on Assets and Return on Equity. The study utilized secondary data obtained from Annual report and accounts of the selected banks for the period under study. The data were analyzed using ordinary least square method and ratio analysis. The specific finding of the work is that Return on asset and Return on equity have

inverse relationship with non-performing loans and loan loss provision respectively while they are positively related to loans and advances. The conclusion therefore is that the effects of non-performing loans on Commercial Banks' performance is negative and cannot be underestimated, and poses a fundamental danger to the very existence of the Banks as corporate business entities. Based on the above findings, the work recommends that banks should maintain high credit standards while the Apex Bank and other regulatory agencies should maintain high surveillance on banks' credit operations.

Godlewski, (2004) used Return on asset (ROA) as a proxy for bank performance and the result shows that banks profitability negatively impacted on the level of non-performing loans. AlsoWarue (2013) in a study identified that bank lending rates are positively and significantly related to non-performing loans in commercial banks. While Skarica (2014) studied the determinants of non-performing loans in Central and Eastern European countries for the period 2009-2012 and found out that GDP growth rate and unemployment rate have statistically significant and negative association with non-performing loans while inflation has a positive impact on non-performing loans.

Saba, Kouser and Azeem (2012) in their study on determinants of non-performing loans in the US banking sector for the period 1985-2010 using ordinary least square regression model for data analysis and found that real total loans have positive significant effect on non-performing loans, while interest rate and GDP per capital has a negative significant association with non-performing loans. Ali and Iva (2013) conducted a study on the impact of bank specific factors on non-performing loans in the Albanian banking system. The study employed ordinary least square regression model to analyze panel data for the period 2002-2012. Their findings reveal that real exchange rates and loan growth rate have a positive association with non-performing loans, while GDP growth rate and interest rate had negative association with non-performing loans. The study show that inflation rate had insignificant effect on non-performing loans.

Also in Albanian, Shingjergji (2013) studied the impact of bank specific factors on non-performing loans in the banking system using a simple regression model for data analysis. The study found that capital adequacy ratio had negative but insignificant association with non-performing loans, while return on equity and loans to asset ratio had negative but significant effect on

non-performing loans, Their study also found that total loan and net interest margin had positive significant relationship with non-performing loans.

The varied studies reviewed so far have attempted to evaluate the interrelationships between collateral typeswithout specific evaluation of the liquidity prowess of equitable mortgage collaterals. In the light of more current or recent data. The deficiencies highlighted above tend to provide the gap which this study intends to address and to that extent, provides a relevant basis in support of the problem statement earlier addressed.Unlike previous studies, this research will be incorporating the influence of the collateral of banks and their non-performing loan into the equation. Similarly, the study ensures a uniform standard of measurement of all employed data which was missing in many other studies.

III.   METHODOLOGY

The study employed the ex-post facto research design. This was applicable considering the historical nature of employed data. Based on this, the study proposed testable hypotheses to evaluate the nature of predictive and prevailing interrelationships between the various dimensions of Nigerian Deposit Money banks' non-performing loans and the study's selected collateral types for analytical and policy formulation purposes. The population in focus is all the banks operating in Nigeria at any point in time over the study period which operational records are consolidated by the central bank of Nigeria in the statistical bulletin. Presently, there are 33 operating deposit money banks in Nigeria according to the Central Bank of Nigeria (2020). The study employed the consolidated statistics for all the operating banks in Nigeria in accordance with Central Bank publications. Consequently, the sample is equal to the population which is 33 deposit money banks as at 31st December 2020.Due to the nature of the various collateral avenues available to the Deposit money banks in Nigeria, a comprehensive adoption of all equitable mortgagecollateral avenues will be impossible and inconsistent. To this extent, the study employed a purposive/non-random sampling method and therefore limits its sample elements to collateral avenues and blanket liens collateral which constitute even and accessible equitable mortgage collateral avenues available to the deposit money banks. The sample period of study is from 1981 to 2020as a result of the availability of uniform and statistically sufficient datasets.This study hopes to rely on secondary/published sources of data, especially from reputable institutions,

specifically, the annual reports and Statistical Bulletins of the Central Bank of Nigeria.

Model Specifications:
This study employed the investigative research process. It will be reinforced with three fundamental models arising from theoretical constructs. This study employedsub-standard loans as a proxy for non-performing loans. Accordingly, the empirical model is formulated in a functional form as follows;

$$SSL = f(EQM_t) \quad 3.1$$

Where;
SSL   =   Sub-standard loans
EQM   =   Equitable mortgage

Secondly, doubtful loans will be formulated as a function of this study's explanatory variables as follows;

$$DBL = f(EQM_t). \quad 3.2$$

Where;
DBL = Doubtful loans and EQM retains their notations in equation 3.1.

Thirdly, the study employed lost loans as a proxy for non-performing loans with valuable results. Accordingly, and in line with the above study, it is proposed that:

$$LSL = f(EQM_t). \quad 3.3$$

Where;LSL = Lost loans and EQM retainsits notations in equations 3.1 and 3.2.

For estimation purposes, equations 3.1, 3.2 and 3.3 are re-written as follows to accommodate the estimation parameters;

$$SSL_t = \alpha_0 + \alpha_1 EQM_t + \mu_t \quad 3.4$$

$$DBL_t = \beta_0 + \beta_1 EQM_t + \pi_t \quad 3.5$$

$$LSL_t = \varphi_0 + \varphi_1 EQM_t + \psi_t \quad 3.6$$

Where;
SSL, DBL and LSL retain their previous notations, α_0, β_0, and φ_0 are the constants for equations 3.4, 3.5 and 3.6, while α_{1-} α_5, β_{1-} β_5, and φ_{1-} φ_5 are the respective coefficients for EQM for the respective equations 3.4, 3.5 and 3.6. Further, μ_t, π_t, and ψ_t are the error (stochastic) terms for the estimated equations 3.4, 3.5 and 3.6 respectively.

Methods of Data Analysis
This study will employ various methods of statistical analysis. For the purpose of clarity, the study proposes to proceed with presentation of the following analytical tools;

Stationarity (Unit Root) Test:
Given the specific objectives of this study, unit root tests will be conducted on all the study time-series variables in order to ascertain the extent or not, the data could be relied upon for further estimates in order to avoid spurious estimates. Maddala (2007), as well as Gujarati and Porter (2009), spell out the unit root procedure as for a given time series within the differencing framework. However, if the time series are found stationary at levels, i.e. I(0), then there will be no need for any further differencing. Accordingly, equation 3.7 below provides a general framework for differencing as follows;

$$\Delta Y_t = \alpha + \beta T + \delta Y_{t-1} + \gamma_i \Delta Y_{t-i} + \varepsilon_t$$
$$3.7$$

Where;
Y is the dependent variable of choice.
α is the slope, while Δ is the first difference operator.
β_i = (for i = 1 and 2) and δ_i (for i = 1, 2 –δ) are given parameters.
ε equals the stochastic process which is assumed stationary
$_t$ is the number of lags preferred in accordance with Akaike criterion in order to ensure that ε_t remains white noise.

Accordingly, the resulting hypothetical situations for possible testing arising from equation 3.7 above are;
H_0: $\beta_i = 0$. This implies that there is a unit root. As such, the time series data collected is non-stationary and,
H_A: $\beta_i \neq 0$. This implies that there is no unit root in the time series. As such, series is stationary.

Following this, the decision rule for unit root test is that the Augmented Dickey-Fuller (ADF) test statistics should in absolute terms, be higher than all the corresponding McKinnon's critical values at 1%, 5% and 10% levels of significance. Consequently, a rejection of the null hypothesis will for all-time series variables constitute sufficient basis for reliance of the time-series data for subsequent analyses and employment of same for Johansen's co-integration test. However, if the null hypothesis fails to be rejected at first differencing, further differencing will be conducted on the first differenced variants in order to achieve stationarity in accordance with equation 3.8 below:

$$\Delta^2 \ddot{Y}_t = \ddot{Y}\Delta Y_{t-1} + \beta T + \delta Y_{t-1} + \gamma_i \Delta Y_{t-i} + \varepsilon_t$$
$$3.8$$

Given this further differencing in equation 3.8 above, the resulting hypotheses for testing will be;
H_0: $\ddot{Y}_i = 0$, implies the existence of a unit root. Consequently, time series is non-stationary

H_0: $\ddot{Y}_i \neq 0$. implies non-existence of a unit root. As such, time series is stationary.
However, if stationarity is not achieved at the first and second stages of differencing, either due to fractional integration or the problem of small sample/lower time coverage, then Auto Regressive Distributed Lag Bound (ARDL) test will be employed.

Johansen's Co-integration Test:
This test will be employed to evaluate the extent of the prevailing long-run relationship between each set of the study variables to be employed as expressed in equations 3.1, 3.2 and 3.3.
Given a time series with assumed stationary disturbances as well as a defined order of integration say n, the set of time series variables are said to be consequently integrated of order n also. Brooks (2009) observed that where a given set of variables prevail, which consist of a minimum of two variables, it necessitates setting up a variance auto regression (VAR) model that equally accommodates the variables in their differenced first forms inclusive of given k lags of the nature k-1 which is associated with a matrix of T-coefficient in nature. Accordingly, Brooks (2009) expressed the nature of Johansen's co-integration within a multivariate framework with a given number of g variables as expressed below in equation 3.9.

$$\Delta X_t = \tau_1 \Delta X_{t-1} + \ldots\ldots + \tau_{k-1} \Delta X_{t-k+1} + \pi X_{t-k} + \varepsilon$$
$$3.9$$

The decision rule is that the trace statistics value should be higher than the critical value at the 0.05 level.

Equilibrium/Error Correction Estimations:
To evaluate the nature of long-run/short-run relationships that may prevail between the dependent variable in each set of equation and each of the explanatory variable as well as the rate at which the relationship is corrected to equilibrium in the long-run, the Error Correction estimation technique is employed. If all study variables converge to a given set of long term values, they by implication, will not change. Hence, everything in the expression would cancel out. However, Brooks (2009) observed that error correction model approach can avert this problem by employing combinations of the first differences as well as lagged values of the co-integrated time series in accordance with equation 3.12 below:

$$\Delta X_t = \lambda_0 + \lambda_1 X_{t-1} + \lambda_2 T + \sum_{i=1}^{n} \varphi i \Delta X_{t-i} + \varepsilon$$

3.10

Where:

$\lambda x_{t-1} + \lambda_2 T$ represents the error correction term. Θ represents the long term relationship between the time series variables x and y. λ_t is the short term relationship between x and y while λ_2 represents the speed at which the variables adjust to equilibrium.

Granger Causality Test

The standard pair-wise Granger causality test seeks to examine the extent to which variations in a given set of time series say Y, tend to promote, support or reinforce growth in another variable say X. It also, evaluates the extent to which inclusion of the lagged values of the variables would tend to significantly improve the explanation by virtue of the significance of their coefficients in a regression framework. In this sense, Brooks (2009), Maddala (2007) as well as Gujarati and Porter (2009)

advance a formulation for the Pair-wise Granger causality framework as below in equation 3.11.

$$X_t = \beta_0 + \sum j=1pA11, jX1(t-j) + \sum j=1pA12, jX2(t-j) + \mu_t$$

3.11

$$Y_t = \alpha_0 + \sum j=1pA21, jX1(t-j) + \sum j=1pA22, jX2(t-j) + v_t$$

3.12

Where;

X_t and Y_t are the time series variables under evaluation. μ_t and v_t constitute the idiosyncratic (white noise) errors embodying all variations in X_t and Y_t which are not incorporated in their lagged values. A maximum lag length of 2 will be stipulated.

IV.   RESULTS AND DISCUSSIONS
4.1: Presentation of Data
The employed time series data are presented in this section as follows to reflect the numerical trend of employed variables over the study period 1981-2019.

Table 4.1 Sub-standard loans (SSL), Doubtful loans (DBL), Lost loans (LSL), and Equitable mortgage (EQM) in Nigerian Deposit Money Banks1981 - 2020.

Year	SSL ₦-B	DBL ₦-B	LSL ₦-B	EQM ₦-B
1981	7.285	3.107	1.735	0.246
1982	9.068	3.867	2.160	0.239
1983	9.918	4.230	2.363	0.334
1984	10.593	4.518	2.524	0.397
1985	11.110	4.738	2.647	0.386
1986	12.960	5.527	3.088	1.469
1987	17.921	7.643	4.269	2.728
1988	23.227	9.906	5.534	4.193
1989	25.843	11.021	6.157	6.743
1990	28.516	12.161	6.793	5.553
1991	35.150	14.990	8.374	1.082
1992	49.405	21.070	11.770	16.507
1993	108.050	46.080	25.741	23.446
1994	71.994	32.025	16.564	15.530
1995	80.503	36.251	18.326	50.760
1996	91.214	41.854	20.418	43.847
1997	103.826	48.645	22.795	46.932
1998	112.253	52.820	24.544	41.756
1999	125.026	59.712	26.945	87.484
2000	139.798	67.852	29.646	132.140
2001	168.108	84.455	34.377	250.737
2002	189.513	96.741	38.073	350.439
2003	210.968	109.059	41.777	378.372
2004	248.333	131.320	47.867	405.726

2005	294.857	159.306	55.330	415.734
2006	344.931	189.511	63.327	1,232.401
2007	487.586	277.579	85.210	888.336
2008	915.486	543.925	149.880	1,459.162
2009	1,119.382	670.268	180.950	1,208.803
2010	1,187.092	711.496	191.591	1,210.522
2011	1,100.129	656.052	179.032	1,606.494
2012	1,474.342	888.844	235.649	1,885.161
2013	1,595.971	963.770	254.379	2,101.343
2014	1,829.981	1,108.935	289.965	1,894.075
2015	2,028.375	1,231.839	320.209	1,493.043
2016	2,266.908	1,379.831	356.475	1,765.578
2017	2,415.154	1,471.393	379.197	2,304.505
2018	2,438.720	1,485.030	383.217	2,204.668
2019	2,746.626	1,676.380	429.888	2,301.834
2020	3,088.951	1,889.242	481.722	2,399.001

Source: Central Bank of Nigeria Statistical Bulletin

4.2 Data Analysis
4.2.1. Stationarity Test
This study proceeds to evaluate the stationarity of employed variables over the study period, which results are presented in table 4.2;

Table 4.2 Results of Unit Root Test (Augmented Dickey Fuller) at level

Variable	ADF statistics At Level	T- 1%	Mackinnon's test critical values @ 5%	10%	Probabili ty Level	Order of Integratio n	Decision
SSL	-2.323661	-3.632900	-2.948404	-2.612874	0.9399	0(0)	Not stationary
DBL	-0.725277	-3.632900	-2.948404	-2.612874	0.8273	0(0)	Not stationary
LSL	-2.416214	-3.626784	-2.945842	-2.611531	0.1445	0(0)	Not stationary
EQM	-1.530918	-3.699871	-2.976263	-2.627420	0.7392	0(0)	Not stationary

Source: Extracts from E-Views 10.0 output.

The results of the test for the stationarity of employed variables at levels shown in table 4.2 above indicate that none of the study variable is stationary at level, since all the ADF t-statistics are on absolute basis lower than all Mackinnon's test critical values at 1%, 5% and 10% respectively with all their significance levels far lower than 0.05 minimum acceptance level. Due to the insignificance of the study variables at level, the study proceeds to evaluate the stationarity of the employed variables at the first difference. The results are presented below in Table 4.3.

Table 4.4: Results of Unit Root Test: (Augmented Dickey Fuller) at First Difference.

Variable	ADF T-statistics 1st difference	Mackinnon's test critical values @ 1%	5%	10%	Probability Level	Order of Integration	Decision
D(SSL)	-4.899645***	-4.243644	-3.544284	-3.204699	0.0007	I(1)	Stationary
D(DBL)	-8.407534***	-3.632900	-2.948404	-2.612874	0.0000	I(1)	Stationary
D(LSL)	-6.789215***	-3.769597	-3.004861	-2.642242	0.0000	I(1)	Stationary
D(EQM)	-4.553106***	-3.699871	-2.976263	-2.627420	0.0000	I(1)	Stationary

*** sign at 10%, 5% and 1%, ** sign at 10% and 5%.
Source: Extracts from E-Views 10.0 output.

The stationarity test results at first difference presented in table 4.4 above shows that all the employed variables are significant at first difference. The results therefore confirm absence of any unit root in the time series. To that extent therefore, all the employed variables are confirmed reliable for further estimations with minimal possibility of biases in long run estimations as well as satisfy conditions for employment in Johansen Co-integration analysis. In light of the observe stationarity, the study therefore proceeds to the cointegration test.

Presentation of Johansen Co-integration Test for Study Models One to Three:
To evaluate the extent to which a valuable long run relationship prevailed among the employed variables, the study employed the Johansen's cointegration technique. The results of the Johansen's cointegration analysis are presented in table 4.5 below for the first study model, which employed sub-standard loans as the dependent variables.

Presentation of Johansen Co-integration Analysis for Model 1: Sub-standard loans (SSL)
Model 1: Sub-standard loans (SSL)
Table 4.5: Results of Johansen Cointegration Analysis for Model 1: Sub-standard loan Model (SSL)

Date: 11/03/21   Time: 11:35
Sample (adjusted): 1984 2020
Included observations: 36 after adjustments
Trend assumption: Linear deterministic trend
Series: D(SSL) D(EQM)
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.925799	194.6783	95.75366	0.0000
At most 1 *	0.656510	106.2449	69.81889	0.0000
At most 2	0.022117	0.760405	3.841466	0.3832

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.925799	88.43338	40.07757	0.0000
At most 1 *	0.656510	36.33230	33.87687	0.0249
At most 2	0.022117	0.760405	3.841466	0.3832

 Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
 * denotes rejection of the hypothesis at the 0.05 level
 **MacKinnon-Haug-Michelis (1999) p-values

Source: E-Views 10.0 output extract

The results of Johansen's Cointegration analysis shown in table 4.5 above for both Trace and Max-Eigen Statistics indicate five (5) significant co-integrating equations. The results therefore provides evidence to assert the prevalence of significant long run relationship between the collateral types of the government and sub-standard loans (SSL) as a proxy for non-performing loans. It further provides evidence of non-prevalence of full-rank situation.

Presentation of Johansen Co-integration Analysis for Model 2: Doubtful loans (DBL)
The Johansen's Cointegration results of the study variables with doubtful loans as proxy for non-performing loans as shown in table 4.6 below:

Table 4.6: Johansen Cointegration for Model 2: Doubtful loans (DBL) as Proxy for Non-performing loans:

Date: 11/03/21   Time: 11:37
Sample (adjusted): 1984 2020
Included observations: 36 after adjustments
Trend assumption: Linear deterministic trend
Series: D(DBL) D(EQM)
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.884537	176.4434	95.75366	0.0000
At most 1 *	0.610086	103.0441	69.81889	0.0000
At most 2	0.244042	9.512153	3.841466	0.8620

 Trace test indicates 2 cointegratingeqn(s) at the 0.05 level
 * denotes rejection of the hypothesis at the 0.05 level
 **MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**

None *	0.884537	73.39936	40.07757	0.0000
At most 1 *	0.610086	32.02221	33.87687	0.0019
At most 2	0.244042	9.512153	3.841466	0.8620

Max-eigenvalue test indicates 2 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: E-Views 10.0 output extract

The results of Johansen's Co-integration analysis on employment of doubtful loans as proxy for non-performing loans indicate that, both the Trace and Maximum Eigen show the presence of five significant co-integrating equations. This confirms evidence of prevalence of significant long run relationship between Nigerian Deposit Money banks'collateral types and non-performing loans as measured by Doubtful loans (DBL), as well as non-prevalence of full-rank situation.

Presentation of Johansen Co-integration Analysis for Model 3: Lost loans (LSL)
Table 4.7: Johansen Cointegration for Model 3: Lost loans (LSL) as Proxy for Non-performing loans

Date: 11/03/21   Time: 11:44
Sample (adjusted): 1984 2020
Included observations: 36 after adjustments
Trend assumption: Linear deterministic trend
Series: D(LSL) D(EQM)
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.889562	181.5518	95.75366	0.0000
At most 1 *	0.645650	106.6396	69.81889	0.0000
At most 2	0.237741	9.229959	3.841466	0.0724

Trace test indicates 2 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.889562	74.91221	40.07757	0.0000
At most 1 *	0.645650	35.27402	33.87687	0.0239
At most 3	0.237741	9.229959	3.841466	0.0724

Max-eigenvalue test indicates 2 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: E-Views 10.0 output extract

The results of Johansen's Cointegration from employing lost loans as dependent variable shown in table 4.7 above also indicates the presence of 5 significant co-integrating equations. It therefore shows material evidence of a significant long run relationship between collateral types held by Nigerian banks and non-performing loans measured by Lost loans (LSL).

Presentation of Error Correction Model Estimations;

To ascertain the nature of long run dynamics in the study models, the Error Correction Model was employed. The results are presented in table 4.11 to 4.13 below;

Error Correction Model Estimation for Model 1: Sub-standard loans (SSL)
The results of error correction estimation for sub-standard loans (SSL) model one are shown in table 4.11 below:

Table 4.11: Results of Error Correction Estimation for Sub-standard loans (Model 1):

Error Correction Model
Dependent Variable: D(SSL)

Date: 11/03/21   Time: 11:59

Sample (adjusted): 1983 2020

Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	140.2799	12.98535	10.80294	0.0000
D(EQM)	3.374303	11.10025	3.039843	0.0051
D(EQM-1)	-0.264312	0.182076	-1.451654	0.1586
ECM(-1)	-0.918624	0.094914	-9.678512	0.0000
R-squared	0.860203	Mean dependent var		16962.94
Adjusted R-squared	0.830246	S.D. dependent var		17319.52
F-statistic	28.71505	Durbin-Watson stat		1.965226
Prob(F-statistic)	0.000000			

Source: E-Views 10.0 output extract

From the results of Error Correction estimations for sub-standard loans (SSL) model 1, it can be observed that after adjusting for short-run distortions, variations in the study's explanatory variables jointly explain 86.02% of variations in Sub-standard loans (SSL). The ECM has the expected negative sign and its associated F-statistic value of 28.71505 is significant. It confirms a good line of fit. Further, the Durbin-Watson statistic of 1.965226 is within the acceptable range. The absolute value of the ECM is 91.86%. This implies that 91.86% of the disequilibrium in Nigerian banks'Sub-standard loans is offset by short-run

adjustments in the study's explanatory (predictor) variables yearly. The ECM value of 91.86% is also associated with a probability value of 0.0000, which is statistically significant at the 0.05 level.

The results indicate that in the long run, current values of equitable mortgage have significant influences on Nigerian Deposit Money banks'sub-standard loans (SSL) as a proxy for non-performing loans.

Error Correction Model Estimation for Doubtful loans (DBL): Model 2:

The results of Error correction estimation for   Doubtful loans are shown in table 4.12 below:

Table 4.12: Results of Error Correction Model Estimation for Model 2: Doubtful loans (DBL) model 2:

Dependent Variable: D(DBL)
Method: Least Squares
Date: 11/03/21   Time: 12:07
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.004708	0.005178	0.909167	0.3710
D(EQM)	1.96E-08	4.18E-07	0.046918	0.9629
D(EQM-1)	3.15E-08	6.98E-07	0.045160	0.9643
ECM(-1)	-0.316296	0.150948	-2.095397	0.0074
R-squared	0.622424	Mean dependent var		0.004846
Adjusted R-squared	0.565629	S.D. dependent var		0.027675
F-statistic	6.510091	Durbin-Watson stat		2.081170
Prob(F-statistic)	0.020164			

Source: E-Views 10.0 output extract

The Error Correction estimates results shown in table 4.12 above indicate that in the long run, after adjusting for short-run distortions, variations in the study's explanatory variables jointly explain 62.24% of doubtful loansin Nigerian banks. The ECM has an expected negative sign. Its associated F-statistic value of 6.510091 has a probability of 0.020164 which is significant at a 5% level. It thus, confirms a good line of fit. Further, the model's Durbin-Watson statistic of 2.081170 is within the acceptable range. The absolute value of the ECM is 31.62%. This implies that 31.62% of the disequilibrium in Nigerian banks'doubtful loans (DBL) is offset by short-run adjustments in the explanatory (predictor) variables yearly. The ECM value of 31.62% is also associated with a probability value of 0.0074, which is statistically significant at the 0.05 level.

In the long run, model (2) shows that all lagged revenue values have insignificant influences on doubtful loans (DBL).

Error Correction Model Estimation for Lost loans (LSL): Model 3.
The results of error correction model for lost loans are shown in table 4.13:

Table 4.13: Results of Error Correction Model for Lost loans (LSL) Model 3

Dependent Variable: D(LSL)
Method: Least Squares
Date: 11/03/21   Time: 12:12
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.009720	0.009143	1.063169	0.2968
D(EQM)	-6.15E-07	7.39E-07	-0.833214	0.4118
D(EQM-1)	1.82E-06	1.20E-06	1.513261	0.1418
ECM(-1)	-0.436118	0.132032	-3.303128	0.0026
R-squared	0.560858	Mean dependent var		0.005165
Adjusted R-squared	0.518958	S.D. dependent var		0.049965
F-statistic	8.945721	Durbin-Watson stat		2.023863
Prob(F-statistic)	0.019883			

Source: E-Views 10.0 output extract

The results presented in table 4.13 above show that this study's explanatory variables jointly explain 56.09% of Nigerian Deposit Money banks'Lost loans (LSL) in the long run. The ECM has the expected negative sign. The associated F-statistic value of 8.945721 has a probability of 0.019883 which is significant at 5% level. It confirms a good line of fit. Further Durbin-Watson statistic of 2.081170 is within the acceptable range. The absolute value of the ECM is 43.61%. This implies that 43.61% of the disequilibrium in Nigerian banks'lost loans (LSL) is offset by short-run adjustments in the explanatory (predictor) variables yearly. The ECM value of 43.61% is also associated with a probability value of 0.0026, which is statistically significant at the 0.05 level.In the long run, lost loans model shows that Nigerian Deposit Money banks'lost loans is significantly insensitive to both current and lagged value of equitable mortgage

Pairwise Granger Causality Estimation:
To ascertain the extent to which the employed variable of this study support, promote and/or re-inforce themselves in the process of growth, this study executed the pair-wise Granger causality tests. The results are shown below for all the models employed in this study as below:

4.2.5.1: Presentation of Pairwise Granger Causality Results for Sub-standard loans (SSL), Model 1 (SSL):
The results of Pair-wise Granger causality for sub-standard loans (SSL) model 1 is shown below;

Table 4.14: Results for Pairwise Granger Causality Test Estimation for the 3 models:

Pairwise Granger Causality Tests

Date: 11/03/21   Time: 12:15

Sample: 1981 2020

Lags: 2

Null Hypothesis:	F-Statistic	Prob.
D(EQM) does not Granger Cause D(SSL)	0.30573	0.7389
D(SSL) does not Granger Cause D(EQM)	7.61194	0.0092

D(EQM) does not Granger Cause D(DBL)	36	0.01026	0.9898
D(DBL) does not Granger Cause D(EQM)		0.01414	0.9860
D(EQM) does not Granger Cause D(LSL)	36	1.64496	0.2105
D(LSL) does not Granger Cause D(EQM)		0.14036	0.8696

Source: E-Views 10.0 output extract

The results of Pairwise Granger Causality test for lost loans model shown in table above confirms prevalence of one significant uni-directional causalities spilling from SSL to EQM. These obviously result from the fact that sub-standard loanstends to be supported or promoted based on appropriateness of the liquidity of equitable collaterals held by banks.

V. DISCUSSION OF FINDINGS

This study disaggregated the findings in the light of the study models employed. These discussions will, therefore, follow the models accordingly for clarity. These are;

Model I: Sub-standard loans Model: This model is represented as:

SSL = f (EQM).

Equitable mortgage (EQM): This variable displayed at current level, a positive and significant influence on sub-standard loans (SSL). The result provides evidence that equitable mortgagees provide very reliable and predictable collateral typeto Nigerian banks. This might probably have resulted from that fact that Nigerian Deposit Money banks' government might largely be able to liquidate these loan types hence, this result. In all, equitable mortgagees are more reliable and predictable in Nigerian banks compared with cash deposits/treasury certificate collaterals which experience higher default collection rate. The Granger Causality show that equitable mortgage supports Nigerian Deposit Money banks'sub-standard loans as shown in table 4.14. These results are in support of the findings of Godlewski, (2004), Warue (2013), Saba, Kouser and Azeem (2012), Ali and Iva (2013), Albanian, Shingjergji (2013), Ranjan and Chandra (2003), and Hamisu (2011), andin conflict with John (2018) and Ozurumba (2016).

The Granger Causality results in table 4.14 also supports the above analysis that blanket liens collateralin Nigerian banks promotes her sub-standard loans as a type of non-performing loan.

Model 2: Doubtful loansModel: This model is represented as:

DBL = f (EQM).

On specific basis, and relying on results shown in tables 4.12 and 4.15 which are discussed as follows;

Equitable mortgage (EQM): From tables 4.12 and 4.15, equitable mortgage insignificantly relates and also, insignificantly promotes or supports Nigerian Deposit Money banks'Doubtful loans. Since equitable mortgage accrues to the deposit money banks in accordance with Nigerian Deposit Money banks'default rules and prudential guidelines, the results could have emanated from the fact equitable mortgage might not have constituted a significant source of doubtful loans elements on the part of Nigerian Deposit Money banks' due to the length of liquidation, hence this insensitivity of Nigerian Deposit Money banks'DBL to variations in equitable mortgage collateral. However, a more appropriate explanation would have been possible if this research had access to detailed breakdown of sources and applications of collaterals and liquidation proceesess with respect to each collateral types . The study supported the research of Alihodžić and Ekşi (2018), Atoi (2018), Kingu, Macha and Gwahula (2018), John (2018), Etale, Ayunku and Etale (2016), and Ozurumba (2016).

Model 3: Lost loansModel: This model is represented as:

LSL = f (EQM).

On specific basis and relying on the results shown in tables 4.13 and 4.16, the following details are discussed;

Equitable mortgage (EQM): This study element displays a negative and insignificant influence on Lost loans (LSL). Although, the direction of the relationship is as expected theoretically but the insignificant nature of the relationship is an issue of concern. The results of causality analysis in table 4.16 equally demonstrate the disconnect between Nigerian Deposit Money banks'equitable mortgage and lost loans as they operate independently . In this

instance do not support or promote themselves in the operational environment of banks .These results agree with Alihodžić and Ekşi (2018), Atoi (2018), Kingu, Macha and Gwahula (2018), John (2018), Etale, Ayunku and Etale (2016), and Ozurumba (2016).

VI.   SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Summary of Findings

This study evaluated the nature of prevailing interrelationships between equitable mortgage collateral liquidity and non-performing loans indicators in deposit money banks over the period 1981-2020. The study employed both the current and one-year lagged values of the collateral types as appropriately determined through the appropriate lag-length selection test to determine the optimal lag length appropriate. This is because of the profound fact that some current government collaterals expenditures on non-performing loans projects could become of significant effect on the nation's non-performing loans indicators in later periods. The study accordingly employed both the current and one-period lagged values of Nigerian Deposit Money banks'collateral types on basis. These include cash deposits/treasury certificate collaterals (CDT), equitable mortgage (EQM), Fixed/Floating charges (FFC), inventory financing collateral (IVT) and Blanket liens collateral (BLK).

Three crucial indicators of Nigerian Deposit Money banks' non-performing loans were employed which include sub-standard loans (SSL), Doubtful loans (DBL) and Lost loans (LSL). Further, the study employed stationarity test and observed all the variables to be stationary at the first difference. The study proceeded to evaluate the nature of prevailing long-run relationships by employing the Johansen cointegration method. The results show significant long-run relationships between all employed variables per model of the study. In the long run, the study assessed the varying influences of employed collateral types on Nigerian Deposit Money banks' non-performing loans and observed that;
i.   Equitable mortgage (EQM) displayed at current level, a positive and significant influence on sub-standard loans (SSL).
ii.   Equitable mortgage (EQM) insignificantly related with Doubtful loansin Nigerian banks.
iii.   Equitable mortgage (EQM) displayed a negative and insignificant influence on Lost loans (LSL).

Conclusion

The study observed high level of non-performing loan and poor liquidity of equitable mortgage collaterals. But, with the high rate of non-performing loans, it is obvious that the assets backing these loans are not quality assets due to observed lapses in liquidation of these collateral types.From the results of this study, the following conclusions are arrived at with respect to the three models expressed. These models include Nigerian Deposit Money banks'sub-standard loans, doubtful loans and lost loans as functions of equitable mortgage. They are;
i)   Among the variables of study, equitable mortgageis the most valuable factors in explaining Nigerian Deposit Money banks'sub-standard loans.
ii)   Equitable mortgageis the valuable factors that support or promote Nigerian Deposit Money banks'sub-standard loans as a type of non-performing loan.

Recommendations

In accordance with the results of this study, the following recommendations are made;
i)   Only marketable equitable mortgage assets should be accepted for loan purposes.
ii)   The CBN should set a write off policy for banks to declassify NPLs with 100% provision from the statement of financial position within 4 years. This is to ensure transparency of financial information to users.
iii)   Banks should actively observe the respective sectoral investment contribution and use this as a guide as to the required level of development needed and mobilize loans accordingly. This should therefore inform the mobilization of capital resources to stimulate and rejuvenate these sectors. This is important in light of the Economic Recovery and Growth Plan (ERGP) which seeks to encourage investment diversification.

REFERENCES
[1].   Abah, D., &Naankiel, P. W. (2016). Structural adjustment program in Nigeria and its implication on socio-economic development, 1980–1995. Calabar Historical Journal, 6(2), 45-71.
[2].   Ali, S. & Iva, S. (2013). Impact of Bank Specific Variables on the Non –Performing Loans Ratio Albanian Banking System,Journal of Finance and Accounting 4(7).
[3].   Alihodžić, A., & Ekşi, İ. H. (2018). Credit growth and non-performing loans: evidence from Turkey and some Balkan

countries. Eastern Journal of European Studies, 9(2).

[4]. Atoi, N. V. (2018). Non-performing loan and its effects on banking stability: Evidence from national and international licensed banks in Nigeria. CBN Journal of Applied Statistics. 9(2), 43-74.

[5]. Basel Committee on Banking Supervision, (2001). Risk management practices and regulatory capital: Cross-sectional comparison. Basel Committee on Banking Supervision. Retrieved fromwww.bis.org.

[6]. Bloem, A. M. & Gorter, C. N. (2001). The treatment of Non-Performing loans in Macroeconomic Statistics, IMF Working Paper WP/01/209

[7]. Borio, C., C. Furfine, & Lowe, P. (2001). Procyclicality of the Financial System and Financial Stability: Issues and Policy Options, BIS Paper No. 1, March.

[8]. Business, University of Nairobi, Kenya.

[9]. CBN (2010). Prudential Guidelines for Deposit Money Banks, Central Bank of Nigeria.

[10]. Central Bank of Nigeria (CBN). 2010 Prudential Guidelines for Deposit Money Banks in Nigeria

[11]. Chavan, P., & Gambacorta, L. (2016). Bank lending and loan quality: the case of India.

[12]. Coco, G. (2000). On the use of collateral. Journal of Economic Surveys, 14(2), 191-214.

[13]. Etale, L. M., Ayunku, P. E., & Etale, E. (2016). The impact of non-performing loans and bank performance in Nigeria. International Journal of Humanities and Social Science Invention, 5(4), 1-5.

[14]. Godlewski, C.J. (2004). Bank Capital Credit Risk Taking in Emerging Market Economic. Journal of Banking Regulation 6 (2)128-145

[15]. Grainger, M. A. (2009). Collection Strategies-Treatment, timing and Tone. New Canadian Library.

[16]. Guttentag, J. M., & Herring, R. J. (1986). Disaster myopia in international banking, Essays in International Finance, 164, International Finance section, Princeton University.

[17]. Hamisu, S.K. (2011). Credit Risk and the Performance of Nigerian Banks, Department of Accounting, Ahmadu Bello University, Zaria, Nigeria

[18]. John, T. A. (2018). Effect of Non-Performing Loans on Bank Performance of Some Selected Commercial Bank in the Nigerian Banking Sector. International Journal of New Technology and Research, 4(4).

[19]. Kingu, P. S., Macha, S., &Gwahula, R. (2018). Impact of Non-Performing Loans on Bank's Profitability: Empirical Evidence from Commercial Banks in Tanzania. International Journal of Scientific Research and Management, 6(01).

[20]. Kjosevski, J., &Petkovski, M. (2017). Non-performing loans in Baltic States: determinants and macroeconomic effects. Baltic Journal of Economics, 17(1), 25-44.

[21]. Onyeagocha, S. U. O. (2001), problems and challenges of Nigeria Financial Institution in credit operations. NigeriaBanker, July-December, 2001.

[22]. Ozurumba, B. A. (2016). Impact of non-performing loans on the performance of selected commercial banks in Nigeria. Research Journal of Finance and Accounting, 7(16), 95-109.

[23]. Rajan, R., Aitkin, L. M., Irvine, D. R., & McKay, J. (2016). The real cause of bad loan menace. Journal of Banking and Financial Services, 64(3), 872-887.

[24]. Rajan. R. G. (1994). Why Bank Credit Policies Fluctuate: A Theory and Some Evidence, The Quarterly Journal of Economics, 109 (2), May, pp. 399-441.

[25]. Ranjan, R. & Chandra, D. (2003). Non-Performing Loans and Terms of Credit of Public Sectors Banks in India, An Empirical Assessment Indian Reserve Bank of India. Occasional Papers 24(3)

[26]. Saba, I., Kouser, R., & Azeem, M. (2012). Determinants of non-performing loans: Case of US banking sector, InternationalJournal of Banking and Finance (44) 479-488

[27]. Shingjergji A., (2013). Impacts of bank specific variables on the non-performing loans ratio in Albanian banking system. Journal of Finance and Accounting 4 (7)

[28]. Skarica B. (2014). Determinants of non-performing loans in Central and Eastern European countries, Financial Theory andPractice 38(1) 37-59.

[29]. Warue, B. N. (2013). The effects of bank specific and macro-economic factors on non-performing loans in commercial banks in Kenya: A Comparative Panel Data Analysis. Advances in Management & Applied Economics, 6(3) 135-164.