
**CREDIT RISK MANAGEMENT AND FINANCIAL PERFORMANCE
OF DEPOSIT MONEY BANKS IN NIGERIA: 2003-2016**

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ABSTRACT

This study examined the relationship between credit risk management and the financial performance of deposit money banks (DMBs) in Nigeria. There has been concern for improved commercial banks performance with a view of sustaining the growth potentials in Nigeria economy. Some financial reforms have been executed and yet threats of distress and bank failure looms. This work aimed at determining the effect of credit default risk and concentration risk on the return on assets of DMBs in Nigeria. The independent variables of this study are: Non-performing loans, non-performing loans to total loans ratio, non-performing loans to shareholders' fund, loan to deposit ratio and Herfindahl Hirschman index. Secondary data were sourced from the Central Bank of Nigeria statistical bulletin and Nigerian Deposit Insurance Corporation. Ordinary least square (OLS) regression model was used for model estimation. The results showed that credit default risk has significant effect on the return on assets of Deposit Money Banks in Nigeria; credit concentration risk has significant effect on the return on assets of Deposit Money Banks in Nigeria; there is no significant relationship between Non-performing Loans and the Return on assets of Deposit Money Banks in Nigeria; loans to deposit ratio has significant effect on the return on assets of Deposit Money Banks in Nigeria; credit default risk in terms of non-performing loans to total loans has a positive significant effect on the profitability of Deposit money banks. The study recommends among others that the credit risk managers and officers should be adequately trained and retrained on regular basis on state of art technology on credit assessment and review and to imbibe the discipline of integrity and conscientiousness; and that the job of the credit officers should be guaranteed and protected from unscrupulous and selfish bank managers.

Keywords: Credit default, Loan concentration, Non-performing loans, Bank's financial performance.

1.0 INTRODUCTION

A bank is a person licensed as such whose main business consists of acceptance of deposits that are repayable on demand or at short notices and lending the deposits to bank-customers in order to make profit. Deposit money banks for our purpose means commercial banks. Commercial

bank is any bank in Nigeria whose business includes the acceptance of deposits withdraws able by cheques (Banks and Other Financial Institutions Act, 1991 as amended). They generally retail-banking services. Technically, Deposit money banks, would include all deposit taking financial institutions such as finance houses, microfinance banks, Bank of Agriculture, Investment banks and primary mortgage institutions.

The vital role of deposit money banks credit in ensuring growth has been widely acknowledged. The Deposit money banks' credit on the various economic agents which is regarded as bank loans and advance said in financial intermediation between deficit units and surplus units, enhances productivity, and impacts positively on economic growth (Ali, Jatau&Ashami, 2016).

Deposit Money Banks encounter credit risks in the course of performing their credit function. The credit risk may be Credit collection difficulties or simply "credit risk." Credit collection difficulties refer to defaults, and credit failures, that have been experienced; that is, to actual collection difficulties recorded after the fact. The term "credit risk," on the other hand, is a forward-looking concept, focusing on the probable incidence of credit difficulties in the future. Credit risk, generally arises from the failure of an obligor of the bank to repay principal or interest at the stipulated time or failure otherwise to perform as agreed. Sansui (2009) attributed credit risk in the Nigerian banks to excessive high non-performing loans and non-adherence to credit risk management practices.

Concentration risk is an aspect of credit risk in banks. This is the credit risk associated with any single exposure or group of exposures with the potential to produce large enough losses to threaten a bank's core operation. Rita and Eduard as (2012) mentioned that concentration risk in loan portfolios arises from uneven distribution of credit across sectors or providing large loans to individual borrowers. Concentration risk has been one of the major problems confronting the Nigerian banking industry due to the undue concentration of loans to the oil and gas sector. Modupe (2017) observed that the top five banks in Nigeria in 2016: Zenith Bank, GT Bank, First Bank, United Bank for Africa Plc and Access Bank accounted for 60 percent of loans disbursed to the oil and gas sector which heightened concentration risk.

Non-performing loans (npls) have been viewed to constitute one of the most important factors causing reluctance for the bank stop to provide credit. Huge non-performing loans erode the ability of banks to make a profit (dermine, 2013; hou& Dickinson, 2007; John, 2016). Osuka and amako,(2015)assert that between 1999 and 2009, non-performing loans were critical highatandpeakedat35%in2009in deposit money banks in Nigeria. This excessively high level of Aplin the bank was caused by poor corporate governance practices, lax credit administration processes, and the absence of non-adherence to credit risk management practices. High levels of npl have a tendency to reduce the lending ability of deposit money banks and possibly put them out of business. Asset management corporation of Nigeria(amcon)was established in 2010as a monetary policy response to solve the aching problem of non-performing loan troubling the commercial banks. However, despite the activities of amcon the ratio of npls to total loans in Nigeria remained high at 5.82 percent asat 2011, and short of the global best practice of3 percent. In view of the worrisome situation, the bordered commercial banks to double provisions on performing loans (npls) to 2 percent from 1 percent, in order to build adequate buffers against unexpected losses

(Abioye, 2015). According to Olaoluwa (2015) as at December 31st, 2013, the bank's NPL ratio was 12.98 percent; and by the end of 2014, the ratio improved to 5.81 percent; and by the end of 2015 the NPL ratio stood at 11.12%. The risk assets examination of 20 DMBs as of December 31, 2016, revealed that the NPL ratio has reached 19.91%.

It is against the worrisome condition of the NPLs and concentration risk among the Deposit money banks in Nigeria that this work seeks to determine the relationship between the credit risk management and the financial performance of Deposit Money Banks in Nigeria. Specifically the work studied the effect of credit default risk on the return on assets (ROA) of Deposit money banks (DMBs) in Nigeria; the effect of Loans to deposit ratio (L/D) on return on assets (ROA) of Deposit money banks (DMBs) in Nigeria; the effect of credit concentration risk on the return on assets (ROA) of Deposit money banks (DMBs) in Nigeria; the relationship between non-performing loans and return on assets (ROA) of Deposit money banks (DMBs) in Nigeria.

The following hypotheses guided this study: Credit default risk does not have significant effect on the return on assets of Deposit Money Banks in Nigeria; Credit concentration risk does not have significant effect on the return on assets of Deposit Money Banks in Nigeria; There is no significant relationship between Non-performing Loans and the Return on assets of Deposit Money Banks in Nigeria; and Loans to deposit ratio does not have significant effect on the return on assets of Deposit Money Banks in Nigeria.

The work is further presented in the following sections: Conceptual framework; Theoretical framework; Empirical studies' review; research methodology; data presentation and analysis; Summary of findings, conclusion and recommendations.

2.0 CONCEPTUAL FRAMEWORK

2.1 Bank Credit risk concept

The quality of credit and credit risk are related concepts. The term "credit quality" describes the credit packaging and level of likely success all things being equal, i.e. the rewards and hazards of credit. Credit risk is the probability that a loan will not be repaid according to the terms of the contract. Not minding the different meanings, a common element is that they relate to the risk of credit difficulties.

Credit creation exposes banks to credit risks (Kolapo, Ayeni & Oke, 2012). Credit risk in this instance refers to delinquency and default by borrowers. Delinquency means delay in payment while default denotes non-payment. Credit risk is the unwillingness of a borrower to fulfill a pre-committed contract. Credit risk can be of the following types: the Credit default risk, credit concentration risk and country risk.

Credit Default Risk is the risk of loss arising from a debtor being unlikely to pay its loan obligations in full or the debtor is more than 90 days past due on any material credit obligation. The fundamental determinants of credit default risk are the CAMELS factors: capital adequacy, asset quality, earnings potential, liquidity and sensitivity to market risk (Chodnicka-Jaworska & Jaworski, 2017).

Concentration risk is the risk associated with any single exposure or group of exposures with the potential to produce large enough losses to threaten a bank's core operations. The

concentration of credit exposures can pose risks to the earnings and capital of any financial institution in the form of unexpected losses (Arindam, 2010). Credit concentration risk arises in banks due to the following reasons: the specialization of banks say in certain areas of activities (they credit companies that carry out a certain economic activity) with the aim of becoming a leader of the market; seeking for higher profits when rapidly increasing economic activity comes in to being, banks positively measure its perspectives and expect higher than the average profits (e.g. From the rise of costs of assets, higher margin of credits or charges); the reasons outside the control of the bank arising from saying due to their reasons outside the control of the bank, E.G. A small-size market, in which the bank is operating. Herfindahl-Hirschman index is a best-known and widely used measure among accumulative indicators of concentration. Generally, herfindahl-Hirschman index (hhi) is the sum of squares of the market shares of all companies in the industry concerned (Valvionis, 2007; Rita & Eduardas, 2012).

Country risk: Credit risk consists of two elements namely: quantity of risk and quality of risk (Raghavan, 2005). Tijani (2012) described the elements as the severity and frequency of risk. The quantity of risk refers to the outstanding loan balance as on the default date while the quality of risk denotes the severity of loss.

The bank's exposure to credit risk stem from the level of Non-performing loans. Non-performing loans can be classified into three categories:

Substandard: Loans whose interest or principal payments are longer than three months in arrears of lending conditions are eased. The banks make 10% provision for the unsecured portion of the loans classified as substandard.

Doubtful: Full liquidation of outstanding debts appears doubtful and the account suggests that there will be a loss, the exact amount of which cannot be determined yet. Banks make 50% provision for doubtful loans.

Virtual Loss and Loss (Unrecoverable): Outstanding debts are regarded as not collectable, usually loans to firms which applied for legal resolution and protection under bankruptcy laws. Banks make 100% provision for loss loans (Olawunmi, Deji & Yinka, 2016).

2.2 Bank Credit Risk Management

The aim of credit risk management is to maximize bank's risk-adjusted rate of return by maintaining credit risk exposure within acceptable boundary. The efficient management of credit risk is a vital part of the overall risk management system and is crucial to each bank's success and the survival of all banking establishments. It is the reform important that credit decisions are made by sound analyses of risks in valued to avoid harms to bank's profitability (Rosemary, 2013). It is an activity designed to develop risky bank lending policies. Its effectiveness depends on three main strategic goals of every bank: growth, protection and development. The bank credit risk management involves some procedures namely: Definition of the system, principles and mission of the bank on credit risk; Combined analysis of exogenous and endogenous factors affecting the system of credit risk management; Effective planning for the desired conditions of the given risky positions; Choice of credit risk management strategy and the development of appropriate credit policies; Development of mechanism for implementing credit risk policies; Monitoring and adjustments; Credit

reviewing; Checking all the critical conditions of each credit agreement; and Frequent checking of major credits (Marina, 2009).

Managing credit risk is an essential corporate function. It is a critical component of a bank's overall risk management and is fundamental to the long-term success of any banking firm. Credit risk management if deployed well can be a value enhancing activity that goes beyond regulatory compliance and can provide a competitive advantage to institutions that execute it properly. The components of effective credit risk management comprise active board management oversight; adequate policies; procedures and limits; adequate risk measurement; monitoring and management information systems; and wide internal controls (Lepus, 2004).

2.3 Bank Credit Risk Management Strategies

For an active management of credit risk, banks employ various strategies which include:

- I. **Credit Policy Strategy:** This involves the use of credit manuals which contain statutory requirements on bank lending, credit approval process, credit procedure and penalties for defaulters. Such credit manuals should elicit rules and regulations guiding credit administration within the credit department of banks (Graham, 1997). Some of the methods banks use to monitor adherence to credit policy according to Lepus (2004) are
- II. **Limit Checking:** This involves specifying the maximum exposure a firm is willing to take to counterparty;
- III. **Credit Inspection:** This connotes having an internal audit group that inspects the quality of credit;
- IV. **Education and Training:** This method involves educating employees of the banking firm the relevance and components of credit policy. It involves enlightening employees about current policies;
- V. **Credit Portfolio Management:** This is the process of identifying, analyzing and selecting the best combination of assets in form of loans and advances to be held by the banking firm. Credit portfolio management results in measuring and limiting credit risks taken as well as optimizing the return gained for a given level of credit risk. The objective of credit portfolio management is to improve risk-adjusted returns. Credit portfolio management helps banks to analyze credit risk factors such as inflation, level of interest rates, gross domestic product (GDP) rate, and market value of collaterals (Samuel, Julius & Samuel, 2012);
- VI. **Credit Risk Hedging:** Hedging of credit risk is another credit risk strategy whereby banks control credit risks they have already acquired and make acceptable the credit risks that they about to acquire. The overall objective of credit risk hedging is to optimize the use of banks' capital, so that the risk is minimized for a given return. Hedging helps banks understand whether a deal will be profitable; allows the bank to make better economic decisions and allows better trades to occur if the right decisions are made (Lepus, 2004). The strategies for hedging credit risk include the following: Credit Derivatives; Adoption of An Effective Lending Policy; Compliance to Basel Accord; Credit Bureau; and Credit Securitization.

2.4 Financial Performance

Financial performance is the ability to operate efficiently, profitably, survives, grow and

react to the environmental opportunities and threats (Rosemary, 2013). Financial performance is thus scientific evaluation of profitability and financial strength of any business concern. Bank's profitability refers to the ability of the bank's loans, advances and investments to yield profit for its shareholders. The determinants of financial performance can be classified into two: the micro-economic (internal factors) and the macro-economic (external factors). The micro-economic (internal factors) include: capital adequacy, asset quality, management efficiency and liquidity management. The external factors include: Gross Domestic Product (GDP), macroeconomic policy stability, inflation, interest rate and political stability (Mwongeli, 2016).

The commercial bank's profitability is the focus of this study. The profitability measure include there turn one equity (ROE); net-interest margin(NIM); and Return non Assets(ROA)(Waqas, Muhammed, Haseeb, Inam & Imran, 2014). Return on equity (ROE) is Return on equity ratio that measures a company's earnings performance. The ROE tells common shareholders how effectively their money is being employed. The ROE can be calculated as follows:

$$ROE = \frac{\text{Net Income (NI)}}{\text{Shareholders Equity (E)}}$$

Investors analyze the trend in ROE for individual firms and compared his to historical and industry benchmarks. Arising ROE can signal that a company is able to grow profits without adding new equity into the business, which dilutes the ownership share of existing shareholders (Kijewska, 2016).

Net Interest Margin (NIM) is the ratio of net interest income to the average earning assets (interest earning assets) or net interest profitability (Svetlana, 2014). This indicator is less frequently encountered in reports and statistics compared to returns on assets (ROA) or returns on equity (ROE). The larger the net interest margin, the more successfully does the bank manage its' interest bearing assets. $\text{Net Interest Margin} = (\text{Interest Received} - \text{Interest Paid}) / \text{Average Invested Assets}$.

Return on Asset (ROA) falls within the domain of performance measures and tracks DMBs ability to generate income based on it sassiest. There to exclude non-operating income and donations. ROA provides a broader perspective compared toothier measures asset transcends the core activity of DMB sanely, providing loans, and tracks income from operating activities in clouding investment, and also assesses profitability regardless of the DMBs funding structure. ROA is expected to be positive as a reflection of the profit margin of the DMBs, otherwise it reflects non-profit or loss. Return on Assets (ROA), reflects the organization's ability to use its assets productively. $\text{ROA} = \text{After-tax profits} / \text{Starting (or period-average) asset}$.

3.0 EMPIRICAL STUDIES REVIEW

Kargi (2011) assessed the effect of credit risk on the profitability of banks in Nigeria. Data relating to the performance of the sampled banks were gathered from the annual reports and accounts over five years (2004-2008) and analyzed using regressions and correlation techniques. The study incorporated the ratio of loan loss provision to classified assets

(LLP/CL) as a measure for credit risk. The results of the study revealed that credit risk management has a significant impact on the profitability of Nigerian Banks.

Kolapo, Ayeni and Oke (2012) carried out an empirical investigation into the quantitative effect of credit risk on the performance of commercial banks in Nigeria over the period of 11 years (2000-2010). Five commercial banks were selected on a cross-sectional basis. Panel model analysis was used to estimate the determinants of the profit function measured by Return on Asset (ROA), ratio of total loan and advances to total deposit (LA/TD) and the ratio of loan loss to classified loans (LLP/CL). The results revealed that the effect of credit risk on bank performance is similar across banks in Nigeria. Furthermore, it was discovered that a 100% increase in non-performing loans reduces profitability (ROA) by about 6.2% while a 100% increase in total loan and advances increase profitability by about 9.6%.

Taiwo, Ucheaga, Achugamonu, Adetiloye, Okoye, and Agwu (2017) carried out an empirical investigation into the quantitative effect of credit risk management on the performance of Nigeria's Deposit Money Banks (DMBs) and Bank lending growth over the period of 17 years (1998-2014). Using regression techniques the result of the study showed that sound credit management strategies can boost investors and savers confidence in banks and lead to a growth in funds for loans and advances which leads to increased bank profitability. The finding revealed that credit risk management has an insignificant impact on the growth of total loans and advances by Nigerian Deposit money banks. The study the reform recommended that DMB in Nigeria should strictly adhere to their credit appraisal policies which ensures that only credit worthy borrowers have access to loan able funds. Banks are tone sure that funds are allocated to borrowers with decent to high credit ratings.

Olawunmi, Deji and Yimka (2016) investigated loans default (problem loans) and returns on assets in Nigeria banks, employing the data of five banks for a period of five years (2010-2014), using the ordinary least squares (OLS) regression techniques to check the relationship between problem loans and returns on assets (ROA). A major suggestion is that banks in Nigeria should enhance the incapacity in credit analysis and loan administration, while the regulatory authority should pay more attention to banks compliance to relevant provisions of Bank and other Financial Institutions Act (1991) and prudential guidelines.

Lepus (2004) examined best practices in strategic credit risk management which viewed specific areas like effective credit risk management; enterprise view of credit risk; strategy, policy and business processes alignment; active management of credit risk. The study revealed that the main ingredients of effective credit risk management are robust technology, defined business processes, detailed policies and sophisticated analytics. It also revealed that Basel II is the key driver in shaping the banks' approach to credit risk management. The findings from Lepus' survey illustrate that credit risk management practices differ among banks, as it is dependent upon the nature and complexity of individual banks' credit activities.

Abdullahi (2013) assessed the efficacy of credit risk management on the performance of banks in Nigeria with particular reference to Union Bank Plc. The aim of the study was to determine if credit risk has an effect on the profitability of banks and to determine the relationship between "interest income" and "bad debt" of the union bank. Data were analyzed using correlation, regression and time series analysis. The standards used to measure

profitability were: Returns on Equity (ROE); Returns on Assets (ROA); ratio of net interest income to total assets (NI/TA); ratio of net interest income to total income (NI/TI). The study concluded that credit risk affect the performance of Union Bank Plc and that to maintain high interest income, attention needs to be given to credit risk management.

Anthony (2010) carried out an empirical study on credit risk management in the Nigerian banking industry. The study asserts that the basic credit risk problem in the Nigerian banking industry is the drive to grow its risk assets by taking excessive risks. According to Anthony (2010), the most widely used indicators of credit risk are: the ratio of total loans to total deposits; the ratio of non-performing loans to total loans; ratio of net charge-off of loan to loans; the ratio of provision for loan losses to total loans; the ratio of non-performing assets to equity. Onaolapo (2012) analyzed credit risk management in Nigeria commercial banking sector over the period of six years. Findings of the study indicated minimal causation between deposit exposure and performance but greater dependency on operational efficiency parameters.

Shahid, Tasheen-ul-Ahad, Faisal, Asif and Ateeq (2012) evaluated the impact of credit risk on the profitability of Nigerian banks. The findings showed that credit risk management has significant effect on the profitability of Nigerian Banks. Hence, management needs to be cautious in setting up a credit policy that will have no negative effect on profitability.

Aykut (2016) stated that there is a strong relationship between bank performance and economic growth. The study investigated the effect of credit and market risk on bank performance for the Turkish banking sector. The results suggested two main findings: (i) Credit risk has a negative and FX rate has appositve effect, but interest rate has insignificant effect on banking sector profitability, (ii) credit and market risk have a positive and significant effect on conditional bank stock return volatility.

4.0 RESEARCH METHODOLOGY

The study design of this work is ex post-facto using regression techniques. This study covers the two areas of credit risk that affect the Nigerian banking industry 2003 to 2016. These Credit risks are credit default risk and concentration risk. The data were sourced from the annual reports and statement of accounts of Nigerian Deposit Insurance Corporation (NDIC); Central Bank of Nigeria (CBN) annual reports and accounts; and CBN statistical bulletin; CBN banking supervision annual reports.

The model specification for establishing a relationship between credit risk and deposit money banks' profitability was adopted from Olawunmi, Deji and Yimka (2016).

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + e \dots \dots \dots (1)$$

This work proposed that:

$$ROA = f(NPL/TL, NPL/SHF, HHI, LTDR, NPL)$$

Explicitly, it may be written as:

$$ROA = \beta_0 + \beta_1 NPL/TL + \beta_2 NPL/SHF + \beta_3 HHI + \beta_4 LTDR + \beta_5 NPL + e \dots \dots \dots (2)$$

Where:

ROA= Return on assets

NPL/TL= Non-performing loans to Total loans Ratio
 NPL/SHF= Non-performing Loans to Shareholders’ Fund ratio
 HHI= Herfindahl-Hirschman Index (HHI)
 LTDR= Loan-to-Deposit ratio (LTDR)
 NPL= Non-performing Loans
 β_0 = Constant term
 $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ = Coefficients of the independent variables
 e = error terms

The *a priori* expectations of the model in line with the hypotheses are indicated in table 1.

Table 1: A priori expectations

Classification	Variables	Expected effect
Credit default risk	Non-performing Loans to Total loan ratio (NPL/TL)	Negative (-)
	Non-performing Loans to Shareholders’ Fund ratio (NPL/SHF)	Negative (-)
	Non-performing loans (NPLs)	Negative (-)
	Loan to Deposit ratio (LTDR)	Negative (-)
Concentration risk	Herfindahl-Hirschman Index (HHI)	Negative (-)

Source: Authors’ compilation

The data were processed using e-views 7 and the model was estimated using the Ordinary Least Square regression method. It is important to note that the **Herfindahl-Hirschman Index(HHI)** is the sum of squares of the market shares of all companies in the industry concerned. Given as: $HHI = \sum_{i=1}^n s_i^2$

Where; HHI stands for the percentage of the sum of squared market shares of all companies in the industry, and s_i^2 stands for the squared market share of the *i*th company in the industry (Pavicet *al*, 2016). However, for the purpose of this study, the HHI stands for the sum of squared of the percentage share of loans that are distributed to the sectors of the economy from deposit money banks in Nigeria.

In addition, Rita and Eduardas (2012) affirmed that the Herfindahl-Hirschman Indexes best-known and widely used measure among accumulative indicators of concentration. It is popularly used to measure concentration risk. The formula of the index may be drawn as follows:

$$HHI = (\%S_1)^2 + (\%S_2)^2 + (\%S_3)^2 + \dots + (\%S_i)^2 + \dots + (\%S_n)^2$$

Where: %S– a percentage of every loan of the loan portfolio in a decree sing order. And according to Arindam (2010), as a general rule, a HHI below 0.1 (10%) signals low

concentration, while a HHI above 0.18 (18%) signals high concentration. Between 0.1 and 0.18 the industry is moderately concentrated.

5. 0 DATA PRESENTATION AND ANALYSIS

The input data processed in this study are presented in Table 2.

Table 2 Dependent and Independent variables input data

Year	ROA	Credit default risk		Concentration risk	LTDR	NPLs
	(%)	NPL/TL (%)	NPL/SHF (%)	HHI (%)	(%)	(₹' Trillion)
2003	2.67	20.45	81.38	43.10	61.9	0.24
2004	3.12	21.60	90.03	43.72	68.6	0.32
2005	1.85	24.10	64.14	50.03	70.8	0.36
2006	2.65	7.92	22.50	15.97	75.60	0.23
2007	3.64	7.39	23.98	17.15	91.75	0.39
2008	4.29	6.25	16.78	17.52	85.20	0.46
2009	-9.28	32.80	135.70	15.42	89.21	2.92
2010	3.91	15.04	250.85	13.56	66.13	1.08
2011	-0.04	4.95	17.13	13.68	55.95	0.36
2012	2.62	3.51	14.34	14.30	54.29	0.29
2013	2.33	3.20	13.35	15.55	57.95	0.32
2014	2.29	2.81	12.01	14.10	68.11	0.35
2015	2.34	4.88	12.79	11.83	73.76	0.65
2016	1.48	12.80	43.84	14.03	87.69	2.08

Sources: CBN statistical bulletin and authors' computation

The descriptive statistics are shown in table 3.

Table 3: Descriptive Statistics

	ROA	HHI	LTDR	NPL	NPL_SHF	NPL_TL
Mean	1.705000	21.42571	71.92429	0.717857	57.05857	11.97857
Median	2.480000	15.48500	69.70000	0.360000	23.24000	7.655000
Maximum	4.290000	50.03000	91.75000	2.920000	250.8500	32.80000
Minimum	-9.280000	11.83000	54.29000	0.230000	12.01000	2.810000
Std. Dev.	3.338299	13.27806	12.57558	0.802498	67.29536	9.437331
Skewness	-2.767127	1.396475	0.228290	1.950892	1.903322	0.876097
Kurtosis	9.778341	3.106076	1.816207	5.440200	5.949556	2.592755
Jarque-Bera	44.66810	4.556897	0.939068	12.35412	13.52774	1.887686
Probability	0.000000	0.102443	0.625294	0.002077	0.001155	0.389130
Sum	23.87000	299.9600	1006.940	10.05000	798.8200	167.7000

Sum Sq. Dev.	144.8751	2291.991	2055.888	8.372036	58872.65	1157.822
Observations	14	14	14	14	14	14

Source: E-views 8 output data

The descriptive statistics shown in tables 2 and 3 reveal the mean return on assets of the deposit money banks in Nigeria over the period under review (2003 to 2016), to be 1.705% with the highest value of 4.29% in 2008 and the lowest value of -9.28 in 2009 following the banking crisis of 2009. This period recorded huge mismanagement of depositors funds by the bank managements causing the ratio of non-performing loans to shareholders’ funds to rise to its second highest value in 2009 and subsequently its highest value in 2010 (135.70 and 250.85 respectively). This period coincided with the highest value of non-performing loans recorded (₦2.92 Trillion). In this same period, majority of the deposit money banks’ total loans were not repaid leading to the highest ratio of non-performing loans to total loans of the commercial banks in 2009 (32.8%). The Jarque-Bera statistic for ROA is 44.66810 (prob. 0.00000); indicating the distribution is normal.

The Ordinary Least Square Method was used to run the regression analysis. The regression estimates were analyzed using the R-squared, the coefficients or regression, the F-statistic and the Durbin-Watson statistic. The output data are shown in Table 4.

Table 4: OLS output data on the model

Dependent Variable: ROA				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.147831	1.839738	-3.885245	0.0046
HHI	0.340910	0.056772	6.004841	0.0003
LTDR	0.105145	0.023642	4.447466	0.0021
NPL	0.850114	0.879653	0.966419	0.3621
NPL_SHF	0.038494	0.005404	7.122708	0.0001
NPL_TL	-0.736358	0.101556	-7.250797	0.0001
R-squared	0.959966	Mean dependent var		1.705000
Adjusted R-squared	0.934945	S.D. dependent var		3.338299
S.E. of regression	0.851464	Akaike info criterion		2.813809
Sum squared resid	5.799933	Schwarz criterion		3.087691
Log likelihood	-13.69666	Hannan-Quinn criter.		2.788456
F-statistic	38.36602	Durbin-Watson stat		2.6579

				07
Prob(F-statistic)	0.000022			

Source's-views 8 output data

Table 4 shows the regression output for ROA and the other independent variables: HHI, LTDR, NPL, NPL_SHF, and NPL_TL. From the results, R-squared value of 0.959966 suggests that 96 percent of the variations in ROA is explained by variations in the independent variables. This indicates a good fit of the model. The F-Statistic value is 38.36602 with Probe (F-statistic) of 0.000022 indicates the model is globally useful and significant at 5 percent level of significance. The Durbin-Watson statistic is 2.657 which is little above the benchmark of 2. Thus, we accept the hypothesis of no autocorrelation in the time series data.

The regression model estimate is $ROA = -7.147831 + 0.340910HHI + 0.105145LTDR + 0.850114NPL + 0.038494NPL_SHF - 0.736358NPL_TL$

For each unit increase in HHI, LTDR, NPL, and NPL_SHF, the ROA increases by 0.340910%, 0.105145%, ₦0.850114 Trillion, and 0.038494% respectively. However, unit increase NPL_TL will result in decrease of ROA by 0.736358%.

Test of the Hypotheses

The hypotheses are tested using t-statistics and the p-values from the regression estimate. The decision rule for using these statistics is that the null hypothesis is rejected if the p-value is less than 0.05; otherwise accepts the null hypothesis. The summary statistics for hypotheses testing is shown in Table 5.

Table 5: Summary statistics for hypotheses testing

Variables	Calculated t-statistic	Table t - statistic @ 0.05	p - value @ 0.05	Decision
HHI	6.004841	>1.1771	0.0003	Reject
LTDR	4.447466	>1.1771	0.0021	Reject
NPL	0.966419	<1.1771	0.3621	Accept
NPL_SHF	7.122708	>1.1771	0.0001	Reject
NPL_TL	-7.250797	>1.1771	0.0001	Reject

Source: Extracted and computed from Table 4

Credit default risk hypothesis was analyzed from two aspects; the ratio of non-performing loans to share holders' funds and the ratio of non-performing loans to Total loans. From table 5, for the hypothesis one, two indicators were used: NPL_SHF and NPL_TL. Their p values were 0.0001 and 0.0001. The null hypothesis is rejected. Thus, Credit default risk has significant effect on the return on assets of Deposit Money Banks in Nigeria.

For hypotheses two (HHI) and four (LTDR), the p values are 0.0003 and 0.0021 respectively. We conclude that the Credit concentration risk has significant effect on the return on assets of

Deposit Money Banks in Nigeria; Loans to deposit ratio has significant effect on the return on assets of Deposit Money Banks in Nigeria.

The hypothesis three stating that there is no significant relationship between Non-performing Loans and the Return on assets of Deposit Money Banks in Nigeria is accepted given the p value of 0.3621.

Discussion of Findings

From the analysis conducted, the results show that there is a negative and significant relationship between NPL/TL and ROA while NPL/SHF has a positive and significant effect on ROA. This satisfies *a priori* expectation. The result is also in line with the findings of Kargi (2011) and Shahid, *et al.* (2012), who also found a significant relationship between Credit risk management and the profitability of banks. The result also agrees with the findings of Samuel, *et al.* (2012) which indicated a positive relationship between Credit risk and Bank's profitability in Ghana.

Concentration risk which was measured using the HHI was found to have positive and significant relationship with Return on assets of the commercial banks. This agrees with the *a priori* expectations and confirms the findings of Ben and Omran (2008) who found a positive relationship between concentration risk and banks' profitability. It shows that the concentration of loans to specific sector has actually positively affected the profitability of deposit money banks in Nigeria. In order words, high concentrated risk will tend to reduce the profit of the deposit money banks.

The findings further reveal the existence of a significant and negative relationship between non-performing loans and return on assets of the deposit money banks. Non-performing loans are direct shortages on the profitability of the deposit money banks. Kolapo, *et al.* (2012) also found a negative and significant relationship between non-performing loans and return on assets of the deposit money banks in Nigeria.

Loans to deposit ratio was also found to have a positive significant relationship with the return on assets of the deposit money banks. Thus, an increase in the ratio of loans to deposit will result to increases in the profitability contribution of the deposit money banks' assets. Of course, the banks generate profit if more deposits/fund are extended as credits to good bank customers, who keep to the terms of the facilities.

6.0 SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

The summary of findings of this work is that:

1. Credit default risk has significant effect on the return on assets of Deposit Money Banks in Nigeria.
2. Credit concentration risk has significant effect on the return on assets of Deposit Money Banks in Nigeria.
3. There is no significant relationship between Non-performing Loans and the Return on assets of Deposit Money Banks in Nigeria.
4. Loans to deposit ratio has significant effect on the return on assets of Deposit Money Banks in Nigeria.

5. The study has showed that credit default risk in terms of non-performing loans to total loans has a positive significant effect on the profitability of Deposit money banks. However, credit default risk in terms of non-performing loans to shareholders' fund has a negative significant effect on the profitability of deposit money banks in Nigeria. The study also concluded that credit concentration risk has significant effect on the profitability of deposit money banks.

Based on the results from the tests of research hypotheses, the following recommendations should be given consideration by deposit money banks in Nigeria for sound credit risk management and good financial performance:

- i. The bank management should be consistent in credit policies so as not to expose the bank to non performing facilities.
- ii. The credit risk managers and officers should be adequately trained and retrained on regular basis on state of art technology on credit assessment and review and to imbibe the discipline of integrity and conscientiousness.
- iii. The job of the credit officers should be guaranteed and protected from unscrupulous and selfish bank managers.
- iv. The bank credit policy should entrench continuous assessment and the monitoring of counterparty and portfolio to know when a loan is becoming non-performing for prompt predetermined actions.
- v. Banks should employ stringent mechanisms to hasten the repayment of loans by registering and executing collaterals promptly; as well as sharing of intelligence report among banks on credit history of notorious bank customers.
- vi. Borrowers should be adequately informed of the procedures involved in getting a loan and the penalties given for loan defaulters.
- vii. The banks should endeavour to diversify loans to various sectors of the economy to reduce the banks' exposure to high concentration risks in their loan portfolios.

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