THE EFFECTS OF CREDIT RISK MANAGEMENT ON THE DEPOSIT MONEY BANK'S PERFORMANCE IN NIGERIA

[1]Adeusi, Stephen O; [2]Akosile, Mary O; [3]Ogunsanwo, Odunayo F.
[1&2] Department of Finance, Ekiti State University, Ado-Ekiti, Nigeria.
stephen.adeusi@eksu.edu.ng; mary.akosile@eksu.edu.ng
[3] Department of Finance, Federal University Oye-Ekiti, Nigeria.
odunayo.ogunsanwo@fuoye.edu.ng

ABSTRACT

The study investigated how credit risk management affected Nigerian deposit money banks' performance over a 15-year period (2005 to 2019). The macroeconomic variables considered include the total bank loan, the loan to asset ratio, the loan to deposit ratio, and profit after tax. The long-term link that exists among the variables under consideration was examined using OLS regression techniques, pairwise granger causality tests, Johansen-Fisher cointegration tests, and Kao Residual Co-integration tests. The analysis revealed that, with the exception of total bank loans (TBL), all independent variables had a negative association with the dependent variable (PAT). This meant that the loan to asset ratio had a negative relationship with PAT of (-0.844290). The results also showed that the loan to deposit ratio (LDR) has a statistically insignificant connection with the dependent variable (PAT), with a slope of (-1.571297). The study came to the conclusion that credit risk has a short-term, considerable negative impact on bank performance. The loan-to-deposit ratio LDR was also found to be statistically insignificant and to maintain an inverse relationship with the dependent variable (PAT) by -1.571297%, according to the findings. The study came to the conclusion that credit risk has a negative and significant short-term impact on bank performance. The study concluded that the dependent and independent variables may have a long-term equilibrium relationship based on the estimated results of various co-integration tests. The study suggested that banks should, among other things, follow prudent and stringent credit policies to reduce the number of non-performing loans. In order to reduce the likelihood of a bank's failure and ensure that banks appropriately manage their credit risk, regulators must increase supervision at the macro level.

Keywords: Loan to Asset Ratio, Loan to Deposit ratio, Total Bank Loan, DMBs' Profitability

Introduction

Banks that accept deposits and other types of financial organizations are crucial for transferring money from savers to borrowers. According to Campbell (2007), they offer financial services such as the creation of money in various forms, taking deposits of money, lending money, processing transactions, and creating and managing credits. The most lucrative asset for deposit money banks is the creation of new credit, which is a core banking activity. In order to minimize credit risk and link surplus and deficit units in the economy, banks' operations in the economic environment are crucial to the growth of the economy (Kolapo, Ayeni, & Oke, 2012). Ineffective credit policies, fluctuating interest rates, poor

management, ineffective laws, low capital and liquidity levels, insufficient credit assessment, insufficient loan underwriting, and lax loan assessment are a few of the major sources of credit risk (CBN, 2013). Instability in the economy makes it more difficult for borrowers to repay loans due to decreased real wages and an excessive concentration in certain portfolios claim (Chen & Chen, 2012). This has a huge effect on banks' credit management as a result of loan default.

According to Jane, Kennedy, and Willy (2016), risk management is a human activity that entails acknowledging risk, evaluating risk, developing methods to manage it, and reducing chance using administrative resources. It is impossible to overstate how important credit risk is to bank executives and how important it is to the advancement cycle as a whole. In order to protect the bank from the negative effects of credit risk, the credit risk management board regulates bank risk and changes risk pace of return by maintaining recognize risk openness (Campbell, 2007). The board for credit risk is the identifying evidence, assessment, checking, and control of risk arising from the potential for advance reimbursement default (Coyle, 2016). Banks often extend credit with the understanding that the borrower or borrowers would pay back their loans. Despite this, the risk of failure from such expanded loan might result in a notable decrease in banks' remuneration because of the need for arrangements for such advances. When store cash banks don't know to what extent their borrowers would fail, income will change in line with that, putting the banks at an additional risk of inconsistent benefit payments (Onyiriuba, 2009).

When credit isn't properly redirected, managed, and regulated, it has a significant negative impact on banks, reducing their production and causing greater hurt and disappointment (Berger and Christa, 2009). Poor credit management and insufficient credit administration, according to Alalade, Binuyo, and Oguntodu (2014), are the main reasons why Nigeria's banking industry is having trouble. For financial institutions to survive and expand, it is essential that credit risk be managed effectively. Credit risk management is an organized method of handling uncertainties through risk assessment, plan formulation, and risk reduction using managerial resources. Some of the options include transferring to a new party, avoiding the risk, limiting its negative impacts, and accepting some or all of a certain risk. This study focuses on the profitability of Nigerian banks and the key elements that contribute to the risk of bank default. The main goal is to look at the relationship between credit risk management and the loan-to-asset ratio, loan-to-deposit ratio, total bank loan, and profitability of the deposit money bank in Nigeria.

2. Literature and Empirical Reviews

As indicated by Odawo, Makokha and Namusonga (2019), risk management has gotten broad consideration from both the corporate world and the scholarly community, in light of the fact that, as Oduro, Aseidu and Gadzo (2019) expressed it, it is the existence blood of each and every association and corporate officials to manage it definitively any place it shows up. According to Ndubuisi and Amedu (2018), risk management is an organized method for identifying and evaluating the pure loss exposure that a business has as well as choosing the best strategy to address such exposure. In their research, Philip and Abisola (2019) described risk management as a set of coordinated actions that are intended to reduce the negative effects of uncertainty surrounding potential losses. The process of risk management, from the forgone, entails identification, measurement, administration of certain approaches, and

control. Researchers such as Fatemi and Glaum (2000), Ejoh, Okpa, and Egbe (2014), Akotey and Abor (1998), and Fatemi and Glaum (1998) highlighted the benefits of managers paying close attention to risk management. This is so that an organization can achieve its goals, which may include minimizing foreign exchange losses, lowering the volatility of cash flow, protecting earnings from fluctuations, and promoting the survival of the business through growth and profitability. Credit risk, market risk (which includes foreign exchange risk, liquidity risk, and interest rate risk), operational risk, which occasionally includes legal risk, and most recently strategic risk are the different types of risk associated with the banking industry (Asare-Bekoe, 2010; Cooperman, Mills & Gardner, 2000). This essay tries to add to the study, assessment, and management of credit risks in Nigerian deposit money institutions. We are particularly interested in determining whether there is a correlation between the financial success of Nigerian DMBs and their credit risk management practices. Credit risk is the probability that a borrower will either fail to make payments on time or at all (Sinkey, 2002). Due to loan delinquency or borrower default, there is a chance that the actual return on a loan portfolio will differ from the predicted return (Conford, 2000). Loan defaults suggest non-payment, whereas loan delinquencies indicate late payments, and the former, if left unchecked, leads to the latter (Onaolapo, 2012).

According to certain empirical data, credit risk management can forecast a bank's overall performance and profitability. For instance, non-performing loans, a sign of credit risk, can lower a bank's value and weaken the financial system (Agu, 1998). According to Padmanabham (1998), loan failure lowers a bank's resource base for additional lending, degrades employee morale, and lowers borrower trust. The expense of handling past-due loans is frequently quite high, which can lower a bank's profitability levels. Occasionally, the cost of past-due loans is transferred to other clients or borrowers in the form of a high interest margin levied on new loans. The effect of credit risk on the financial performance of Nigerian cash store banks was discussed in a paper written by Folajimi and Dare in 2020. In order to analyze the data, the review engaged in exhibition facto research and used inferential measures. In the study, the following variables were identified: the capital adequacy ratio, the loan loss provisions loan to deposit ratio, and the control variables of bank size. The financial performance (dependent variable) surrogated with return on capital employed (ROCE), the credit risk proxy with non-performing loans (independent variable), and the capital adequacy ratio. According to the study, credit management had a good and considerable influence on the MDB's financial performance. According to the assessment, the credit board has an effect on how much money Deposit Cash Banks in Nigeria show.

In a study of the Kenyan banking sector, Kithinji (2010) showed that non-performing loans, an indication of credit risk, and profitability had a symbiotic relationship. Other empirical research outside of Africa have discovered a strong and substantial link between bank performance and credit risk. For instance, research by Achou and Tengnuh from 2008 showed that better credit risk management enhances bank performance. To secure the bank's assets and safeguard the interests of investors, they conclude that banks must exercise appropriate credit risk management. According to Achou and Tengue, banks with sound credit risk management practices often have reduced net interest revenue and loan default (i.e., impaired loans). Achou and Tengue's findings are corroborated by comparable Swedish research conducted by Hosna and Manzura (2009).

Jane, Kennedy and Willy (2016) examined how credit risk impacted the financial performance of Kenyan commercial banks between 2005 and 2014. Credit risk was

calculated using return on equity (ROE), weighted resources, resource quality, credit loss arrangement, credit and advance proportions, and financial execution. Panel data were used to analyze endogeneity risks and remove time-invariant unobserved firm-specific effects using fixed effects estimation and the generalized method of moments (GMM). The findings indicate a negative relationship between bank profitability and credit risk. It was advised that Kenyan commercial bank management develop their skills in credit analysis and loan administration. There should be developed clear credit standards and lending guidelines.

3. Methodology

The data in this paper are gathered from a variety of secondary sources and span 15 years, from 2005 to 2019. An empirical model based on the modification of Jane, Kennedy, and Willy (2016) in Kenya was used to capture the effect of credit risk management on the performance of Nigeria's five deposit money banks as a case study.

$ROE = f\,(CRWAR, LLPR, AQR, LAR)$……3.0

Profit after tax (PAT) was chosen as the dependent variable in this study because it was seen to be a suitable indicator of financial success along with loan to deposit ratio, total loan, and loan to total asset ratio. The study made the assumption that there was a general multiplicative Cobb Douglas functional connection between the independent variables and the dependent variable, as indicated in model 3.1.

Thus, the following is provided as the study's model:

$PAT = f\,(\text{LDR, TBL, LAR})$……. (3.1)

The econometric form is as follows:

$$PAT = \beta_0 + \beta_1 LDR + \beta_2 TL + \beta_3 LAR + \mu \text{ ……..... (3.2)}$$

Table 3.1: Data Description and Sources

Variables	Symbol	Description	Source
Profit after tax	PAT	It is regarded as the net profit following the deductibility of all costs and taxes. PAT is the metric that most immediately reflects the health of the bank since it represents the amount that may be kept as retained profits or distributed as dividends to owners.	Annual Rep.
Loan to deposit ratio	LDR	It is a frequently employed metric for determining the credit risk of banks. It is calculated by subtracting the bank's total deposits from its total loans.	CBN Bulletin
Bank Total loan	TBL	This includes all performing and non-perforating loans that the bank grants each year in terms of loans and advances.	Annual Rep.
Loan to Total Asset ratio	LAR	Loan match is a ratio that gauges how much the bank is exposed to credit risk. Credit risk exposure is greater for banks with larger loan to total asset ratios.	Annual Rep.

Sources: Authors' compilation

This current study in its bid to examine the dynamic relationship and direction of causality between the variables in the model, it employs the OLS regression techniques and pairwise granger causality test. It is expected '*apriori'* that

$\frac{\partial PAT}{\partial LDR} < 0; \quad \frac{\partial PAT}{\partial TL} > 0; \quad \frac{\partial PAT}{LAR} >< 0;$

4. Results Presentation and Interpretation

Table 4.1: Descriptive Analysis

	PAT?	**TBL?**	**LAR?**	**LDR?**
Mean	31996699	4.36E+08	41.07686	65.55643
Median	15310352	3.07E+08	43.42500	70.18000
Maximum	1.85E+08	1.99E+09	65.44000	85.66000
Minimum	501515.0	177303.0	14.48000	37.97000
Std. Dev.	37906456	4.96E+08	11.21178	14.28126
Skewness	2.068842	1.364751	-0.258742	-0.666032
Kurtosis	7.552558	4.115695	2.366597	2.352241
Jarque-Bera	110.3848	25.36029	1.951219	6.399129
Probability	0.000000	0.000003	0.376962	0.040780
Sum	2.24E+09	3.05E+10	2875.380	4588.950
Sum Sq. Dev.	9.91E+16	1.70E+19	8673.583	14072.86
Observations	70	70	70	70

Source: *E-View*

Due to the nature of the data, a total of 70 observations were used, as shown in Table 4.1. The average LDR in Nigerian deposit money institutions during the past 15 years, according to the mean result, was 65.56% with a standard deviation of 14.3%. The value of LDR ranged from 38% to 85.66%, showing that loans and advances are dependent on the total deposits made by the consumers. The TBL value represents the total loans and advances that deposit money institutions anticipate making to commercial enterprises. From the table, it can be seen that TBL maintains an average of 436%, with lowest and highest values of 177% and 199%, respectively. This demonstrates that Nigerian banks comply with the Central Bank of Nigeria's requirements for loan provisions. Additionally, with minimum and greatest values of 14% and 65%, respectively, the average LAR of Nigerian banks was 41%, indicating that banks should focus on lending to businesses, which is among other possibilities more risky but offers larger returns. According to the Skewness statistic, all the variables were favorably skewed, with the exception of LDR and LAR. Because all the variables have values larger than 1, the Jarque-Bera statistic's probability value demonstrated that all the variables were regularly distributed.

Hausman Test

In econometrics, a statistical hypothesis test known as the Durbin-Wu-Hausman test—also known as the Hausman specification test—is named for James Durbin, De-Min Wu, and

Jerry A. Hausman. The test measures an estimate's consistency in relation to a different, less effective estimator that is previously known to be consistent. It aids in determining if a statistical model matches the data. In panel data, the Hausman test may be used to distinguish between fixed effects models and random effects models. The random effect model will be accepted as the null hypothesis if the probability value associated with the Chi-Sq. Statistics of the Hausman test is more than 5% significance; otherwise, it will not be accepted.

Table 4.2: Hausman Test

Chi Sq. Statistics	**Chi-Sq. d.f.**	**Prob.**
0.334860	3	0.9533

Source: *E-View*

Given that the probability value associated with the Hausman test is more than 5% significant value, it can be inferred from table 4.2 that the random effect model is the appropriate model for the research. As a result, the random effect model will receive all of the attention in this study.

Table 4.3: Random Effect Model

Dependent Variables: PAT

Variables	Coefficient	Std. Error	T-Stat.	Prob.
C	34316798	20295431	1.690863	0.0956
TBL?	0.057269	0.007193	7.961277	0.0000
LAR?	-220190.2	260799.3	-0.844290	0.0416
LDR?	-278013.4	176932.4	-1.571297	0.1209
Random Effects (Cross)				
_ACCESS—C	-19255937		**_FBN—C**	28671343
_FCMB—C	-16091987		**R-squared**	0.542433
_STANBIC—C	-13377142		**Adjusted R-squared**	0.521634
_GTB--C	20053722		**F-statistic**	26.08038

Source: *E-View*

The correlation between the dependent variable (PAT) and the independent factors is shown in Table 4.3. If all variables are maintained constant, PAT will increase by 34316798 units, according to the coefficient of the constant parameter, which has a positive value of 34316798 units. Also in accordance with theoretical expectations, Total Bank Loan (TBL) showed a positive connection with Profit After Tax (PAT) of 0.057269 units, which suggests that a rise in Total Bank Loan will improve PAT by the same amount of units. Contrarily, it was also discovered that the Loan to Asset Ratio (LAR), in accordance with theoretical predictions, was adversely associated to PAT by (-220190.2) units, which implies that a unit rise in the LAR will result in a unit drop in profitability. In a similar vein, the loan to deposit ratio (LDR) was discovered to be negatively correlated with PAT by (-278013.4) units,

meaning that a unit rise in the loan to deposit ratio will cause a corresponding unit drop in PAT. The analysis found that all the variables were statistically significant, taking into account the probability value of the coefficient, with the exception of the loan to deposit ratio (LDR), which has a p-value larger than 5% significant level. The Adjusted R2 coefficient of multiple determination, which has a value of 0.521634, indicates that on the short run, all three explanatory variables (LDR, TBL, and LTA) together can account for about 52% of the behavior of the PAT in the Nigerian deposit money bank, with the remaining 48% being explained by other factors in the model.

The probability is used to test the validity and importance of the research model used for this investigation. The entire model is statistically significant in explaining the behavioral changes in PAT since the probability value of the F-statistics is less than 0.05. However, a glance at the data reveals that Access Bank, FCMB, Stanbic Bank, GTB, and FBN had cross-sectional variability with coefficients of (-19255937, -16091987, -13377142, 20053722, and 28671343, respectively). This demonstrates that First Bank and GTB, with the exception of FCMB, Stanbic Bank, and Access Bank, have a propensity to see increases in the dependent variable (profit after tax).

Long Run Relationship Tests

Table 4.4: Kao Residual Co-integration Test

		t-stat.	**prob.**
ADF		-0.391482	**0.0477**
	Residual variance	2.43E+14	
	HAC variance	1.77E+14	
	RESID?(-1)	-3.310220	**0.0015**
	Observations	70	

Source: E-views

The findings of the Kao Residual Co-integration Test, which we calculated using no deterministic trend as the trend assumption, automated lag length selection based on SIC with lags of 3, automatic bandwidth selection using the Newey-West algorithm, and Barlett Kernel are presented in Table 4.4. The findings indicate that at a 5% level of significance taking the value of ADF into account and a 1% level of significance taking the value of RESID(-1) into account, we have sufficient data to reject the null hypothesis of no co-integration.

Table 4.5: Johansen Fisher Panel Co-Integration Test

Unrestricted Co-integration Rank Test (Trace and Maximum Eigenvalue)

Hypothesized No. of CE(s)	Fisher Stat.* (from trace test)	Prob.	Fisher Stat.* (from max-Eigen test)	Prob.

None	224.8	0.0000	200.0	**0.0000**
At most 1	94.55	0.0000	60.82	**0.0000**
	70			

Observations

Source: E-views

Table 4.5 shows the results of the Johansen- Fisher co-integration test, which was calculated using the asymptotic Chi-square distribution and the quadratic deterministic trend as the trend assumption and lags interval (in first differences). The findings show that, at the 1% level of significance, the null hypothesis of no co-integration may be rejected. This shows that there is a significant long-term equilibrium link between the variables. The study concluded that there is a very likely long-run equilibrium link between credit risk management and deposit money banks performance in Nigeria based on the estimated findings from multiple panel cointegration tests.

5. Conclusions

It was clear from the results of the descriptive study, which was one of several tests on the impacts of credit risk management on the performance of deposit money banks in Nigeria, that there was an excessive dependence on loans being provided on total deposits by banks. The report also demonstrates that Nigerian banks provide the necessary loan provisions as outlined by CBN. Nigerian banks focused on lending, which is among the alternatives more riskier and offers greater return. A random effect has the best effects that the study can rely on, according to the Hausman test results. More importantly, the outcome showed that indicators for credit risk management may influence banks' performance in concert. The findings demonstrated that indicators of credit risk management had an effect on the profitability of Nigerian banks. At a 5% level of confidence, LAR and TBL were not statistically significant. Additionally, there is a significant negative correlation between the loan to total asset and loan to deposit ratios and the performance of deposit money banks (PAT). The fact that there is a negative correlation between the factors and bank profitability suggests that their profitability is declining. The loan to deposit ratio was discovered to be unimportant and negative. Credit risk exposure is greater for banks with larger loan to deposit ratios.

Due to various income streams for the banks, such as bank fees, high interest rates on loans and advances, low interest rates on deposits, and other sources, it has a negligible influence on the profitability of banks that accept deposits. LDR may not appear to pose a danger to bank profitability in Nigeria as a result, but caution should still be used as the negative correlation is small. Additionally, the outcome demonstrated that bank profitability (PAT) and total bank loans continue to have a positive, substantial association. Taking into account their respective P-values, all the variables were statistically significant, with the exception of LDR and the dependent variable. According to the findings analysis, all variables—with the exception of total bank loan—were adversely connected to the dependent variable (PAT) at the random effect stage. The variables that were discovered to have a substantial influence on profit after taxes were the loan to asset ratio and total bank loan.

This is sufficient evidence to draw the conclusion that credit risk management has a shortterm, considerable negative impact on deposit money institutions' performance (PAT). With an estimated 0.521634, the coefficient of multiple determinants (Adjusted R2) produced from the random effect demonstrates the model's strong fit. This shows that the explanatory factors may account for 52% of the behavior of the dependent variable (PAT) of the tested deposit money institutions, with the remaining percentage of behavior being explained by the existence of the error term. This demonstrates that the factors used to explain the dependent variable have captured the behavior of the endogenous variable up to 52% in a suitable manner. According to empirical evidence, total bank loans have a positive but considerable influence on profit after taxes, which is consistent with Li and Zou's (2014) research. In conclusion, the loan to deposit ratio and the loan to assets ratio continue to have a substantial inverse association with the dependent variable (PAT), in keeping with the research of Odawo, Makokha, and Namusonga (2019). The F-statistics p-value is less than 0.05, indicating that the whole model is statistically significant in explaining the behavioral fluctuations in profit after tax. Additionally, the Durbin Watson graph demonstrated that the model does not exhibit autocorrelation. Finally, it was determined that factors related to credit risk management have a significant role in determining deposit money banks' profitability in Nigeria. In other words, the profit after tax has responded to the lending policies of Nigerian banks.

5. Recommendations

The results have significant ramifications for decision-makers, academics, and development partners who are supporting the development of Nigeria's banking and financial sector. This is because one of the functions of the banking sector is to mobilize savings, distribute resources, and diversify risks. A more effective banking system could have a positive effect on financial development and economic growth given that the banking system makes up a significant portion of Nigeria's financial systems, particularly if banks are able to effectively fulfill their role as financial intermediaries (i.e. convert collected deposits into loans for investments). If there is a very strong credit risk environment and management, as well as judicial and legal backing, among other factors, they can achieve this. In addition to the mentioned ramifications, the advice is as follows:

1. In order to boost profitability and credit availability for the deficit units of the economy, deposit money banks in Nigeria should exert enough effort to mobilize deposits.

2. The government should establish proper legislation and provide enough oversight through the central bank and parliaments. Banks must create a portfolio of assets (loans and securities) that diversify the degree of risk in order to control the credit risk that is inherent in both the overall portfolio as well as in individual credits or transactions.

3. Deposit money banks should improve their ability to conduct credit analyses, appraisals, and loan administration; they should also develop clear credit rules and lending standards; and management must ensure that the terms and conditions of loan approval are followed.

4. By boosting competition in the financial sector, a stronger securities market will benefit the banking industry's overall growth. When there is a broad variety of portfolio

options, investors may evaluate the returns and security of their investments across banks and securities market participants. Thus, there is still some pressure on banks to strengthen their financial stability.

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Department of Finance, Ekiti State Univeristy, Ado – Ekiti