

Credit Risk and Financial Performance: Evidence from Microfinance Banks in Nigeria

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Abstract: Microfinance banks hold the key to economic growth in developing economies and their financial health is crucial to achieving this role. One of the factors associated with the financial health of banks is credit risk. Therefore, this study examined the effect of credit risk on the financial performance of microfinance banks in Nigeria. Published financial reports of six purposively selected microfinance banks, covering the periods 2012 to 2018 were used as panel data for the regression model. The panel Ordinary Least Squares (OLS) regression technique was used to estimate the influence of the credit risk variables (proxy by non-performing loans and loan-loss provisions) on the financial performance (proxy by returns on assets) of the banks. The results of the analysis revealed that non-performing loans has a significant and negative effect on returns on assets ($t\text{-stat} = -2.4768$ and $p = 0.02 < 0.05$) while loan-loss provisions has a negative but insignificant effect on returns on assets ($t\text{-stat} = -1.3316$ and $p = 0.19 > 0.05$). Further results also showed a significant and positive relationship between total loans and advances (introduced as control variable) and returns on assets ($t\text{-stat} = 2.8171$ and $p = 0.01 < 0.05$). The study therefore concluded that credit risk significantly predicted financial performance of microfinance banks in Nigeria. It was recommended that microfinance banks should develop credit policies that will enhance proper monitoring of their loan portfolios in order to reduce defaults. Furthermore, government should through their relevant agencies, ensure microfinance bank's compliance with the provisions of the law on debt accumulation.

Keywords: Microfinance; Credit risk; Non-performing loans; Returns on asset.

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I. Introduction

The financial sector is one of the driving forces of a nation's economic growth and banks play prominent roles. Lending activity to individuals, Small and Medium-scale Enterprises (SMEs) and industries is crucial in the race to economic growth, particularly in a developing economy like Nigeria. Microfinance provides the bridge to accessing these formal credits. It is the supply of loans and small credits to finance small projects in order to help the poor have their income, by forming their own small-scale businesses (Munene & Guyo, 2013). This function is carried out by microfinance institutions which are either banks or non-banks (Liman, Khairuddin & Darwina, 2016). Oluyombo (2007) describes Microfinance Banks (MFBs) as means of reaching businesses and persons that have no access or inadequate access to financial services provided by the regular commercial banks. Otieno, Nyagol and Onditi (2016) are of the opinion that a sound and healthy microfinance banking subsector is very crucial for economic development, since the sector assists middle and low end entrepreneurs who operates SMEs. However, loan default, also called credit risk is a major challenge facing microfinance banks and it has limited lending activities to individuals and enterprises in Nigeria (CBN, 2017).

Credit risk is simply the risk of loan default. It is the risk of losing contractually obligated cash flows promised by an individual, a corporation, a financial institution, or government, due to default on the debt obligation (Williams, 2004). Credit risk has been identified to be associated with the performance of loan portfolios in banks (Aremu, Suberu & Oke, 2010; Kargi, 2011; Boahene, Dasah & Agyei, 2012; Ameer & Mhiri, 2013; Ekinci, 2016). Findings have also indicated that banking operations in Nigeria are affected more by credit risk (Ayodele & Alabi, 2014). Its effect, if not properly managed, can negatively impact on a bank's profitability.

The effect of several indicators of credit risk on the performance of banks have been discussed extensively by scholars. These indicators include non-performing loans, provisions for loan-loss, portfolio at risk, net charge-off rate, pre-provision profit, total loans and advances, and others (Aremu, Suberu & Oke, 2010; Kargi, 2011; Kolapo, Ayeni & Oke, 2012; Boahene, Dasah & Agyei, 2012; Ameer & Mhiri, 2013; Kayode, Obamuyi, Owoputi & Adeyefa, 2015; Taiwo, Ucheaga, Achugamonu, Okoye & Agwu, 2017). However, the effect

of these indicators on the financial performance of MFBs in Nigeria is yet to be seen as most of the research works on credit risk in the country revolve around commercial banks (Aremu, Suberu&Oke, 2010; Kargi, 2011; Kolapoet *al.*, 2012; Kayodeet *al.*, 2015; Taiwoet *al.*, 2017). This is partly because the country's microfinance industry is relatively young and still evolving. Besides, lack of sufficient data from this subsector has been a challenge.

The total assets of the microfinance sub-sector in Nigeria stood at ₦408.35 billion, as at the end of 2018 (CBN, 2019). However, reports from CBN confirms this figure to be grossly inadequate when compared with the country's population of over 170 million. This population is characterized by people living below the poverty line, who are veritable target of MFBs. Besides, the country has had her own share of economic recession witnessed between 2016 and 2017, when the standard of living dropped considerably and the country was ranked amongst the top poor-economies in the world (World Bank, 2017). Although the nation has finally existed recession period, from the World Bank reports in 2018, yet economic development is still not very evidenced in the country. MFBs in the world have been identified to hold the key to fast-track quick economic recovery and sustain growth, through provision of loan facilities to individuals and owners of business enterprise.

The CBN has identified non-performing loan as a major credit risk problem facing MFBs in the Nigeria. Reports suggest that many of the MFBs have high volume of non-performing loans which has limited lending activities in the sector (CBN, 2017). In financial terms, high volume of non-performing loans usually result to increase in a bank's loan-loss provisions. In such cases, funds that would otherwise have been used to generate more profits are set aside to cater for possible loss resulting from non-performing loans. In the light of these, the study is guided by the following research questions: What is the effect of non-performing loan on the financial performance of MFBs in Nigeria? What is the effect of loan-loss provision on the financial performance of MFBs in Nigeria?

The main objective of this study was to investigate the effect of credit risk on the financial performance of MFBs in Nigeria. Specifically, the study examined the effect of non-performing loan and loan-loss provision on returns on assets, among MFBs in Nigeria. In order to achieve these objectives, the following hypotheses were tested; non-performing loan does not have a significant effect on the financial performance of MFBs; and loan-loss provision does not have a significant effect on the financial performance of MFBs in Nigeria.

The remainder of the paper is arranged thus; section two consists of the reviews of relevant literatures; section three focuses on the methodology while section four provides the results of the data analysis. Finally, section five presents the conclusion and policy recommendations.

II. Literature Review

Theoretical Background

Microfinance is a financial service for the poor and low-income clients offered by different types of service providers (Karlan & Goldberg, 2007). It is the provision of financial services to individuals traditionally excluded from the banking system (Crabb & Keller, 2011). This assertion agrees with that of Udeaja and Ibe (2006) who define microfinance as the provision of micro-credits to the low income and poor persons in a community. The Central Bank of Nigeria (CBN) refers to financial institutions that engage primarily in microfinance business as microfinance institutions. Lafourcade, Isern, Mwangi and Brown (2005) identify three types of microfinance institutions in Nigeria, namely: regulated (banks); cooperatives (financial cooperatives and credit unions); and unregulated (NGOs and non-bank financial intermediaries). Similarly, Ayayi (2008), in the study of MFIs in Vietnam, classified MFIs into three main types based on the institution, the regulations and core strategies involved. The categories are formal, semi-formal and informal. Oluyombo (2007) defines Microfinance Banks (MFBs) as a globally accepted process of reaching individuals or businesses who are either not served at all or inadequately served by the regular commercial banks.

Credit risk has been defined by many scholars to mean the risk that a borrower will default on any type of debt by failing to make the required payments; the risk that a creditor's ability to repay a loan is impaired; the risk that a loan becomes irrecoverable due to total default; the degree of fluctuation in the value of a debt instrument due to changes in the credit quality of borrowers and many more (Heffernan, 1996; Salas & Saurina, 2002; Chan & Pan, 2012; Aishatti, 2015 and Kayodeet *al.*, 2015). Giesecke (2004) identifies credit risk as the most significant risk facing banks. Ayodele and Alabi (2014) further submit that banking operation in Nigeria is affected more by credit risk. Kayodeet *al.*, (2015) assert that credit risk usually comes from banks' financial activities with individuals, corporate organizations and other banks. According to Basel committee on banking supervision (1999) loan activities are the major and obvious sources of credit risk. Therefore, a high volume of non-performing loans in a bank is an indicator of the presence of credit risk.

Researchers have used different ratios to measure credit risk. These include non-performing loan ratio, loan-loss provision ratio, portfolio at risk ratio, pre-provision profit ratio and total loans and advances ratio (Hassan & Bashir, 2003; Athanasoglou, Brissimis & Delis, 2005; Takang & Ntui, 2008; Aremu, Suberu & Oke,

2010; Kargi, 2011; Kolapo *et al.*, 2012; Boahene, Dasah&Agyei, 2012; Ameer&Mhiri, 2013; Kayode *et al.*, 2015; Otieno *et al.*, 2016 and Taiwo *et al.*, 2017). Although, there is no general consensus among these authors on the actual indicator(s) of credit risk, yet some indicators have frequently been used as study variables in banks. These are the non-performing loan ratio, loan-loss provision ratio and total loans and advances ratio (Takang&Ntui, 2008; Aremu, Suberu&Oke, 2010; Kargi, 2011; Dietrich &Wanzenried, 2011; Kolapo *et al.*, 2012; Ameer&Mhiri, 2013; Kayode *et al.*, 2015; Taiwo *et al.*, 2017).

Several theories have been used to specify the relationship between credit risk and financial performance of banks. Notably among them is the firm characteristic theories, which centered on the management of a firm and its performance in relationship to its loan portfolio. According to Christopher and Ydriss (2008), the theories postulate that the most obvious characteristics of failed banks is not poor operating efficiency, but an increased volume of non-performing loans. Hamisu (2011) further buttressed this theories when he opined that the difference between the failed banks in the US and those that remained healthy or recovered from problems, was the quality of their loan portfolios.

Empirical Review

Several scholars, both nationally and internationally have carried out research works on the empirical relationships between credit risk and financial performance of microfinance banks.

Bourke (1989) worked on a panel of European, North-American and Australian banks and discovered a negative relationship between credit risk and banks' profitability. Athanasoglou *et al.*, (2005) investigated the effect of credit risk on the profitability of banks in Greece, using dynamic panel data model and found that credit risk negatively and significantly affect profitability among the sampled banks. Their findings further implied a lower profit in Greek banks when there is a higher credit risk exposure. In Sweden, Hosna, Manzura and Juanjuan (2009) studied the effect of credit risk management on four banks and discovered that rate of non-performing loan and capital adequacy ratios were inversely related to return on equity (ROE). This inverse relationship between credit risk measures and banks' performance in developed countries has further been established by Epure and Lafuente (2012) and Kolapo, Ayeni&Oke, (2012).

In Ghana, Boahene, Dash and Agyei (2012) studied the empirical relationship between credit risk and profitability using panel data from six selected commercial banks. Their findings show a positive and significant relationship between credit risk and profitability among Ghanaian banks. This assertion is also supported by Ameer and Mhiri (2013), who conducted a similar study on banks in Tunisia. However, Kithinji (2010) investigated the influence of credit risk management on the performance of commercial banks in Kenya, and discovered that credit risk indicator (non-performing loan) has no relationship with profitability. He concluded that other factors influence profit, other than credit risk. This submission has been nullified by further studies on the subject in other developing countries.

In Nigeria, Kargi (2011) did a study on the effect of credit risk on the profitability of commercial banks in Nigeria. Using data from six selected banks for the periods 2004 to 2008, he established an inverse relationship between credit risk (proxy by non-performing loans and total loans & advances) and profitability (proxy by returns on assets). Kolapo, Ayeni and Oke (2012) also investigated the influence of credit risk on bank financial performance in Nigeria, using non-performing loans, loan-loss provisions and total loans and advances as proxies for credit risk. The authors further established the inverse effect of credit risk on banks performance in Nigeria. This result has also been supported by the findings of Kayode *et al.*, (2015) and Taiwo *et al.*, (2017). However, such empirical relationships among the study variables is yet to be established among microfinance banks in Nigeria. Although these banks are smaller in term of their capital base, yet they are more in total numbers than the commercial banks (CBN, 2019). This study was intended to fill this gap in literature.

Conceptual Framework

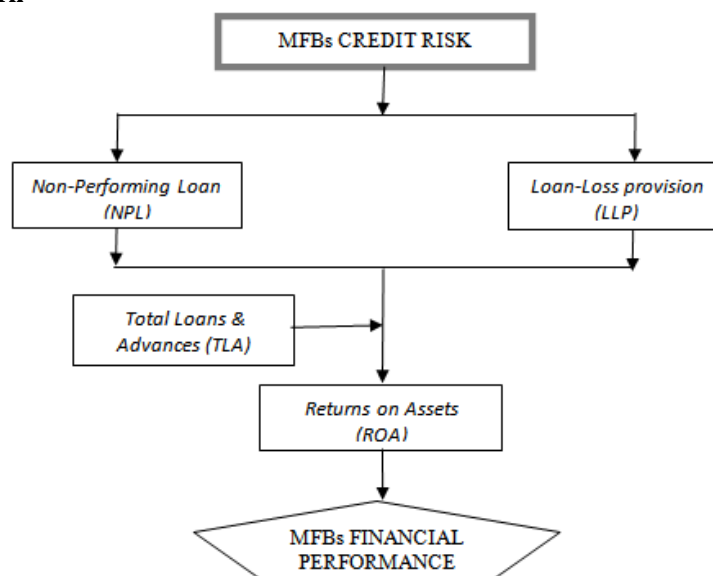


Fig. 1: Conceptual framework on Credit Risk and Financial Performance of Microfinance Banks in Nigeria. Source: Authors’ study framework (2019).

III. Methodology

The Central Bank of Nigeria (CBN) has classified microfinance banks (MFBs) into three categories, based on their required minimum capital base. They are the ‘National’ (₦5 billions capital base), ‘State’ (₦1 billion capital base) and ‘Unit’ (₦200 millions capital base) (CBN, 2019). The MFBs in the national category are the major players in the sub-sector, with branches all over the country. As at the end of 2018, CBN report revealed a total number of eight (8) MFBs in the national category. Six (6) of these banks were purposively selected for the study and their annual financial reports covering the period 2012 to 2018 (7 years) provided forty-two (42) observations, for the panel data analysis in this study.

Descriptive statistical tools such as mean, median, standard deviation, skewness and kurtosis were used for the descriptive analysis of the data. The unit root test and the Hausman specification test were used for the inferential analysis of the panel data, while the Ordinary Least Squares (OLS) technique was used to estimate the parameters of the variables in the model. The analytical model, specifying the relationship between financial performance (proxy by returns on assets) and credit risk (non-performing loans and loan-loss provisions) is written as:

$$ROA_{it} = \beta_0 + \beta_1 NPL_{it} + \beta_2 LLP_{it} + \beta_3 TLA_{it} + e_{it} \tag{1}$$

Where ROA is Returns on Assets measured as the ratio of profit before tax to total assets; NPL is Non-Performing Loan measured as the ratio of non-performing loans to total loans and advances; LLP is Loan-Loss Provision measured as the ratio of loan-loss provisions to total loans and advances; β_0 is the intercept of the model; β_1 to β_3 are the regression coefficients and e_{it} is the panel error term. TLA is Total Loans and Advances and it is introduced as a control variable since it affects the dependent variable. It is measured as the ratio of total loans and advances to total assets.

IV. Empirical Results

Descriptive Analysis

The summary statistics of the explanatory variables in the panel model are presented in Table 1. The descriptive statistics of the credit risk components shows that the sampled MFBs have an average non-performing loan ratio (NPL) of 0.0539 with a standard deviation of 2.65%; an average loan-loss provision ratio (LLP) of 0.0512 with a standard deviation of 5.18% and a total loans and advances ratio (TLA) of 0.7306 with a standard deviation of 9.25%. These show that the microfinance banks on the average, enjoyed a relatively low credit risk during these periods (5.39% - NPL & 5.12% - LLP), even though the average volume of credit facilities to customers was high (73.06% - TLA). Also, the variances of these credit risk measures do not vary significantly across the sampled banks, as indicated by their low standard deviations.

Table 1: Descriptive Statistics of Variables in the Panel Regression Model

	NPL	LLP	TLA	ROA
Mean	0.053966	0.051192	0.730604	0.086282
Median	0.054607	0.036698	0.744897	0.092809
Maximum	0.124632	0.252136	0.880047	0.180180
Minimum	0.011000	0.003602	0.564724	0.001094
Standard Deviation	0.026491	0.051769	0.092480	0.050827
Skewness	0.475548	2.170142	-0.2531	0.163570
Kurtosis	2.665977	7.954758	1.843895	1.902265

Source: Authors' Computation from E-VIEW9 (2019)

Further revelations from Table 1 reveals that the selected MFBs had a positive financial performance throughout the study periods, with the returns on assets ratio (ROA) being 8.62% on the average. This value does not vary significantly during the study periods (2012 – 2018), with the average standard deviation being 5.08%. The median is 9.28%, having a minimum value of 0.10% and maximum value of 18.01%. These statistics suggest a low usage of assets to generate profits among the sample banks during the study periods. A poor returns on the asset of a company will usually discourage investors and limit expansions. This may be part of the reasons why the MFBs sub-sector in Nigeria has not witnessed the desired growth and made the expected impact on the economy.

Unit Root Test

A panel unit root test was carried out on the panel data in the regression model, using the Augmented Dickey-Fuller (ADF) Fisher test, in order to establish the stationarity or otherwise of the variables. Table 2 gives a summary of the result of the test.

Table 2: Summary of the Unit Root Test

Variables	Methods	Statistics	p-value	Order
ROA	ADF-Fisher	47.3596	0.0000	I(0)
NPL	ADF-Fisher	25.8498	0.0113	I(0)
LLP	ADF-Fisher	35.6037	0.0004	I(0)
TLA	ADF-Fisher	28.6929	0.0044	I(0)

Source: Authors' Computation from E-VIEW9 (2019)

The ADF-Fisher test has a null hypothesis that there is unit root, which implies non-stationarity. The result shows that the t-statistic of ROA is statistically significant at the 5% level (t-stat = 47.3596; p = 0.00). This implies stationarity at the level form. Similarly, NPL, LLP and TLA all have t-statistics which are statistically significant at the 5% level (t-stat = 25.8498, 35.6037 and 28.6929; p = 0.01, 0.00 and 0.00 respectively). These imply stationarity at their level forms. The summary of the ADF-Fisher test reveals that all the variables in the panel model are stationary at their level form, and are therefore suitable for the regression model.

Hausman Specification Test

The Hausman test specifies the type of effect on the panel model. The test has a null hypothesis that the random effect and fixed effect do not differ substantially, with an alternative hypothesis that a fixed effect model is appropriate. Table 3 gives the summary of the test. The result shows a chi-square statistic of 8.238 with degree of freedom of 3, which is statistically significant at 5% level (p = 0.0413). This implies that a fixed effect panel model is appropriate for the panel data.

Table 3: Summary of Hausman Specification Test

Correlated Random Effects - Hausman Test			
Equation: Untitled			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	8.23822	3	0.0413

Source: Authors' Computation from E-VIEW9 (2019)

Estimates of Model Parameters

The R-squared result from Table 4 shows that 77% of the variations in the dependent variable (ROA) are explained by the independent variables (NPL, LLP and TLA), suggesting that the model reasonably fit the panel data. The F-statistics ($F = 13.53$ & $p = 0.00$) is also statistically significant at the 5% level, suggesting that the independent variables jointly and significantly explain the variations in the model. The estimated Durbin-Watson statistic (1.50) is less than 2, indicating the absence of autocorrelation in the panel data. The empirical form of the panel model is thus specified as;

$$ROA_{it} = -0.037 - 0.493NPL_{it} - 0.132LLP_{it} + 0.215TLA_{it} \quad (2)$$

Table 4: Estimates of the Variables in the Panel Regression Model

Dependent Variable: ROA				
Variables	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.03733	0.056418	-0.66167	0.5128
NPL	-0.49298	0.199037	-2.4768	0.0186
LLP	-0.13223	0.099298	-1.33162	0.1921
TLA	0.21487	0.076273	2.81711	0.0081
R-squared	0.76632	Durbin-Watson statistic		1.50133
F-statistic	13.52752	Prob (F-statistic)		0.00000

Source: Authors' Computation from E-VIEW9 (2019)

Further results show that the estimate of the co-efficient of NPL is negative and statistically significant at the 5% level ($t = -2.4768$ & $p = 0.019$). This suggests an inverse relationship between NPL and ROA, such that a unit change in NPL results in a corresponding 0.49 unit change in ROA, while other variables remain constant. Similarly, the estimate of the co-efficient of LLP is negative but non-significant at the 5% level ($t = -1.33162$ & $p = 0.192$). This suggests an inverse relationship between LLP and ROA, where a unit change in LLP leads to a corresponding 0.13 unit change in ROA, holding other variables constant. Furthermore, the estimate of the co-efficient of TLA is positive and statistically significant at the 5% level ($t = 2.8171$ & $p = 0.008$). This suggest a direct relationship between TLA and ROA, where a unit change in TLA results in 0.22 change in ROA, with other variables remaining constant. Lastly, the value of the intercept of the model is negative and non-significant at the 5% level ($t = -0.66167$ & $p = 0.513$). This shows that returns on assets will be -0.037, if all other independent variables are zero.

V. Summary of Findings

Empirical result from the panel model has revealed that non-performing loans inversely and significantly affects the financial performance of MFBs in Nigeria. This implies that high volume of non-performing loans among the banks reduces average returns on assets and thus lowers profitability. This finding is consistent with the findings of Kargi (2011); Kolapoet *al.* (2012); Ameer and Mhiri (2013); Kayodeet *al.* (2015); Otione and Onditi (2016) among others, who established an indirect relationship between non-performing loans and bank's profitability. However, the finding disagrees with those of Kosmidou, Tanna and Pasiouras (2005); Ben-Naceur and Omran (2008); Agyei and Dasah (2012); Li and Zou (2014) and Aishatti (2015) who found a positive relationship between non-performing loan and bank financial performance.

Further evidences from the model also establish an inverse relationship between loan-loss provisions and returns on assets among MFBs in Nigeria. This implies that any increase in the bank's provisions for loan-loss will reduces profitability thereby resulting in poor financial performance. This finding agrees with those of Kargi (2011); Kolapoet *al.* (2012); Ameer and Mhiri (2013); Kayodeet *al.* (2015); Otione and Onditi (2016) and others. It however, disagrees with the findings of Kosmidou, Tanna and Pasiouras (2005); Ben-Naceur and

Omran (2008) and Agyei and Dasah (2012) who established a direct relationship between loan-loss provisions and bank's financial performance.

In addition, results also show a direct and significant relationship between total loans and advances and profitability of MFBs in Nigeria. This is expected since loan business is the primary function of the banks and the more the loans are disbursed, the more the interest incomes to the banks. This finding is consistent with the findings of Kolapo *et al.* (2012), Kayode *et al.* (2015) and others, but disagrees with that of Kargi (2011), who established an inverse relationship between total loans and advances and bank's profitability.

VI. Conclusion and Recommendations

This study has investigated the effect of credit risk variables (non-performing loan and loan-loss provision) on the financial performance of microfinance banks in Nigeria. Empirical findings have shown that non-performing loan has a significant effect on the profitability of microfinance banks in Nigeria. However, loan-loss provision does not exhibit such significant effect on profitability. This establishes non-performing loan as a very important credit risk factor which affects financial performance among microfinance banks in Nigeria. Therefore, a strong, healthy and robust microfinance banking sub-sector in Nigeria requires continuous and efficient monitoring of loan portfolios, in order to reduce defaults.

This study recommends regular follow-ups on all customers serving a loan in the bank, by credit managers/officers and frequent updates on their loan-portfolios, in order to be able to identify loans that are close to being tagged 'non-performing'. In addition, policymakers in the microfinance banking sub-sector in Nigeria should devise and implement sound credit management strategies which should include proper credit assessment and evaluation before loan approvals. Furthermore, the federal government in Nigeria, should regularly monitor microfinance bank's compliance to relevant provisions of the law as it concerns debt accumulation, through her relevant agencies. This can be achieved through tougher punishments and stiffer penalties to defaulters of such provisions of the law.

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