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Impact of Capital Adequacy Risk on the Financial Performance of Microfinance Banks in Nigeria

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ABSTRACT

Microfinance banking sub-sector is key to growth and stability, especially in an emerging economy like Nigeria. The sector offers micro-credits to small and medium sized businesses and thus must have sufficient capital to fund their regular operations and guarantee the long-term health of their country's financial system. However, inadequate capital has been reported as a major cause of distress and eventual collapse of banks/financial institutions. Therefore, this study investigated the impact of capital adequacy risk on the financial performance of microfinance banks in Nigeria. Seven microfinance banks operating at the Central Bank of Nigeria's national category were selected and their annual financial reports in the last eleven years were used as panel data for this research. A panel regression model was used to specify the relationship between the dimensions of capital adequacy risk (capital adequacy ratio, operating efficiency & credit risk) and financial performance (return on assets). Descriptive statistical tools such as the mean, standard deviation and Jarque-bera were used to describe the data, while econometric tools such as the LLC unit root, Hausman specification and ordinary least squares technique were used for the inferential analysis. These were done via the E-view 9 statistical software. The results of the analysis revealed that both capital adequacy ratio and cost-to-asset ratio have a direct and significant relationship with return on assets. Similarly, non-performing loan ratio has an inverse and significant relationship with return on asset. The study concludes that capital adequacy ratio, operating efficiency and credit risk are key drivers of profitability among microfinance banks in Nigeria. Therefore, it is recommended that the country's apex bank should enforce compliance with regulations on capital adequacy in the microfinance banking subsector. Furthermore, relevant stakeholders in the bank should ensure prudency in operating cost and monitoring of loan portfolios to reduce defaults.

Keywords: Capital Adequacy Ratio; Operating Efficiency; Credit Risk; Return on Assets

1. Introduction

The financial health of banks has far-reaching effects on the development of new industries and technologies, as well as the economy as a whole (Lipunga, 2014). Any bank's leadership and administration must generate constant income to maintain the institution's continuing concern, and as Lipunga (2021) argues, it is directly tied to the financial soundness of a banking organisation. Equally crucial is the banking sector's profitability, which is highly connected with the health of the economy as a whole (Adeusi et al., 2014). A banking sector that is both productive and skilled may better weather economic downturns (Ally, 2014). Microfinance banking sub-sector has been identified to be crucial to economic growth and stability, especially in emerging economies (Halling & Haydeen, 2006; Otieno, Nyagol & Onditi, 2016). The sector offers micro-credits in form of loans and advances to small and medium size business owners, who may not access such in commercial banks (Oluyombo, 2007). SMEs are catalysts for an emerging economy, such as Nigeria and hence the need for the country's microfinance banks to remain profitable and solvent, while catering for the financial needs of these businesses.

Capital adequacy is the strength or ability of banks as measured by their finances (Pellegrina, 2012). It measures a bank's resilience in unforeseen events and operational setbacks, thereby indicating whether it can successfully integrate new lines of operations. Having a safety net in place to absorb the impact of any hiccups in banking operations is helpful, as it allows a bank to remain operational. One success in the Nigerian banking sector is the upward review of microfinance banks' minimum capital bases (CBN, 2019). Microfinance banks' capital strength is best measured by their capital adequacy ratio, which is the amount of capital needed by law, as a proportion of their risk-weighted assets. Exposure-adjusted credit risks, banking operational efficiency market risks, and the structure and nature of capital held in supporting these exposures are the three significant components that determine a bank's capital adequacy risk, as set out by prudential rubrics on capital adequacy (Okafor, Russell, & Lawal, 2012).

Uchechukwu and Kingsley (2016) argue that a robust regulatory framework is vital for the microfinance banking industry because of their central position and substantial effect on the economy. Key challenges, such as inadequate capital, enhanced non-performing loans, and other assets, act as stressors in the banking sector and have been linked to the poor performance of microfinance banks (Aliyu, Yusof, & Naiimi, 2017; Afolabi, Obamuyi & Egbetunde, 2020). Others include operational efficiency, which is capable of eroding the capital of a bank, if not properly monitored or checked. In the light of these,

the current study investigated the impact of capital adequacy risk on the financial performance of microfinance banks in Nigeria. Specifically, the study examined the effect of capital adequacy ratio, cost to asset ratio and non-performing loan ratio on the return on assets of these banks.

The rest of the paper is arranged thus: section two consists of the literature review, section three presents the methodology used and section four shows the results of the data analysis. The last section reveals the conclusion and policy recommendations.

2. Literature Review

2.1 CONCEPTUAL REVIEW

Capital adequacy, as defined by the Central Bank of the Nigeria (CBN, 2004), occurs when a bank's adjusted capital is high enough to cover its losses and fixed assets, with enough to spare for both present and future growth. A bank is considered to have sufficient capital if it has enough money to meet the required amount and capital ratios for its level of business, to run the bank securely and maintain public confidence, and to invest in the facilities necessary for efficient operations (Rose et al., 2008). According to Olalekan and Adeyinka (2013), a bank may be categorised as under-capitalised, severely under-capitalised, critically under-capitalised, or insolvent based on its capital adequacy ratio relative to the permissible ceiling established by the Basel Accord.

The CBN requires banks to provide updated credit rating ratios compiled by a third-party agency, at end of each year. In addition, these credit ratings are expected to be shown prominently in yearly reports (CBN, 2010). Because adequate capital immediately impacts the amount of money available for loans, which in turn affects the quantity and degree of risk absorption, its impact on a bank's performance cannot be overstated. It is evident that bank capital is serving as a protective buffer against losses brought on by some kinds of uncertainty, as Gardner (I 981 in Hassan and Bashir, 2004) emphasizes. Capital sufficiency is crucial since it aids in distributing the cost of responsible company activity, discourages dishonest business dealings and determines efficiency. Investment return on equity/asset (ROE/ROA), asset growth, loss absorption, and capitalization are four metrics used to evaluate banks' profitability (Qin & Pastroy, 2012).

2.2 THEORETICAL BACKGROUND

Scholars have used several theories to relate capital adequacy to bank’s performance, but the Modigliani-Miller theory postulated in 1958 stands out among the rest (Nugroho & Anggoro, 2013). The theory argues that banks’ market values are explained by their ability to take control of risks associated with their capital. Furthermore, the Buffer theory of capital adequacy, as reported in Shrieves and Dahl (1992), Jacques and Nigro (1997) and Aggarwal and Jacques (2019), claims that financial institutions will keep more money on hand than is really necessary, thereby creating risks which may either be positive or negative. These theories suggest a link between a bank’s performance and its capital adequacy risks and hence form the basis for the model used in the study.

2.3 EMPIRICAL REVIEWS

Muli (2017) analysed the correlation between commercial banks' core capital and their profitability in Kenya. A substantial relationship between the independent factors and financial success was discovered in this descriptive analysis. Mulwa (2015) had earlier used the same descriptive research approach to examine the impact of monetary policy on the financial performance of Kenyan banks and found that the apex bank’s use of monetary policy tools, such as core capital requirements, had little to no effect on the banks' bottom lines. Similarly, Getahun (2015) used a cross-sectional approach to analyse the CAMEL approach impact on the financial performance of commercial banks in Ethiopia and found that core capital had no meaningful effect on financial performance.

In Jordan, Ali (2016) investigated the role of financial institutions’ capital on their productivity. Banks' productivity and earnings were estimated using return on equity (ROE) and return on assets (ROA) and data was used (from 2019-2014) for the study. A linear association was found between capital adequacy and banks' productivity, whereas an inverse relationship was found between the quality of a bank's assets and its profitability. Moussa (2013) used data from 2001-2009 to determine the correlation between financial performance and capital of nineteen Tunisian banks. The ratio of capital to performance was estimated using three metrics: the net interest margin (NIM), return on assets (ROA), and return on equity (ROE). The results showed a connection between financial success and capital. Qin and Pastroy (2012) looked into the banking industry in Tanzania and discovered that core capital had a negative effect on bank profitability. The empirical findings from these developing economies show inconsistent positions on the effect of capital adequacy risk on banks financial performance.

Furthermore, the correlation between bank capital and profits in the United States was studied by Hutchison and Cox (2006). To better understand the relationship between capital and profitability, the research divided its scope between a less regulated time and a more heavily controlled one. Financial leverage was shown to be positively associated with profits in both periods. In Vietnam, Nguyen et al. (2018) conducted an empirical study on the variables determining the profitability of thirteen profitable banks, using data from 2006 to 2015. The results show a positive correlation between liquidity and return on equity (ROE) and a negative correlation between capital structure and net interest margin (NIM). The cost-income ratio was discovered to adversely affect all profitability measurements, with a negative association indicating efficiency and better earnings. Profitability was harmed not just by credit risk but also by foreign ownership. Liquidity had a negative impact on both NIM and ROE, whereas capital structure had a negative impact on ROE. Profitability did not correlate with government ownership, asset size, GDP, or inflation. In addition, Mehta and Bhavani (2017) studied the

productivity of commercial domestic banks in the United Arab Emirates, between 2006 and 2013, to determine the factors which contributed to their growth. The empirical findings indicated that cost efficiency was the most significant across all profitability metrics.

Capital adequacy has also been shown to significantly improve the financial performance of commercial banks in Nigeria (Chinoda, Chingombe, & Chawuruka, 2015; Gary, 2016;). Nestor, Leonard and Okoye (2017), in a cross-sectional study analyzed a subset of listed Nigerian deposit money banks between 2010 and 2015. The findings showed that financial performance was positively and significantly related to capital adequacy. While some studies have established similar results involving these variables in the country (Al-Hadid, 2017; Calem & Rob, 2019), others have also shown capital adequacy to have no impact on the profitability of commercial banks (Mugwang'a, 2014; Musyoka, 2017). This suggests a lack of consensus on the relationship

between capital adequacy risk and profitability, particularly among microfinance banks. This research sought to fill this gap. To achieve this, the following hypotheses were tested; capital adequacy ratio has no significant effect on the financial performance of microfinance banks in Nigeria; operating efficiency has no significant effect on the financial performance of microfinance banks in Nigeria; credit risk has no significant effect on the financial performance of microfinance banks in Nigeria.

2.4 CONCEPTUAL FRAMEWORK

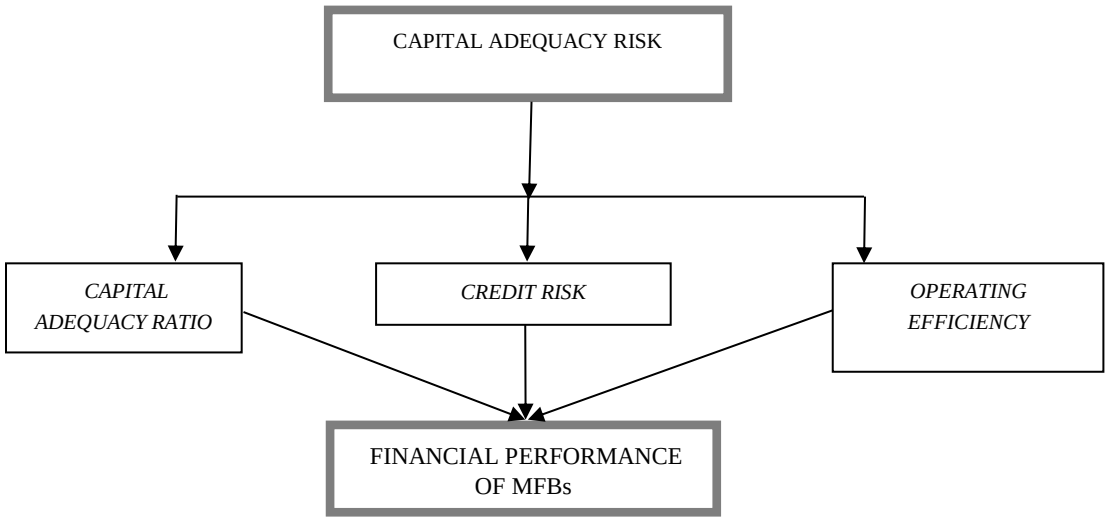

Figure 1: Conceptual Framework
Source: Researcher's conceptualization (2023)

3. Methods

Ten licensed-microfinance banks belong to the top-most ranked 'National category' in Nigeria with minimum operating capital base of N5 Billion (CBN, 2023). Seven of these banks were purposively selected for this study and their financial reports covering an eleven years period (2012-2022) provided the data for the panel regression analysis. Descriptive tools such as the mean, standard deviation, skewness, kurtosis and Jarque-bera were used to describe the panel data, while econometric tools like unit root test, Hausman specification test and panel least squares were used for the inferential analysis. The panel regression model for the hypothesized relationship is specified as;

$$FP_{it} = \beta_0 + \beta_1 CA_{it} + \beta_2 OE_{it} + \beta_3 CR_{it} + e_{it} \quad (1)$$

Where, FP is Financial Performance measured as Return on Asset (ratio of banks profit before tax to their total assets); CAR is Capital Adequacy Ratio measured as the ratio of capital to risk-weighted assets; OP is Operating Efficiency measured as cost-to-asset ratio (ratio of operating expenses to balance sheet total); CR is Credit Risk measured as non-performing loan ratio (ratio of non-performing loans to total loans and advances); β_0 is constant or intercept; β_1 to β_3 is regression coefficients and e_{it} is the error term. The E-view 9 statistical software was used for the analysis and estimates of the panel model.

4. Results

4.1 DESCRIPTIVE ANALYSIS

The summary of the descriptive statistical tools for the core variables in the study are presented in Table 4.1. The statistical tools include the mean, median, maximum value, minimum value, standard deviation, skewness, kurtosis, and the Jarque-bera.

Table 4.1: Statistical Tools of Core Variables

Statistics	Return On Asset	Cost to Asset ratio	Non-Performing Loans ratio	Capital Adequacy ratio
Mean	0.0487	0.0857	0.0978	0.5487
Median	0.0603	0.0484	0.0419	0.6419
Maximum	0.1838	0.4387	0.5506	1.0833
Minimum	-0.2595	0.0000	0.0000	0.0000
Std. Dev.	0.0708	0.0988	0.1273	0.2946
Skewness	-1.3966	1.4581	1.6278	-0.6156
Kurtosis	7.2397	4.5268	5.0389	2.2401
Jarque-Bera	82.7009	34.7628	47.3434	6.7154
Probability	0.3810	0.7423	0.2890	0.3482

Source: Outputs from E-view 9 (2023)

The results from Table 4.1 indicate that the selected microfinance banks have an average non-performing loan ratio of 0.0978 with a standard deviation of 12.73%; an average cost to asset ratio of 0.0857 with a standard deviation of 9.88% and a capital adequacy ratio of 0.549 with a standard deviation of 29.5%. These value suggest that the banks on the average, enjoyed a relatively low credit risk and operating cost during the periods under investigation (CR - 9.8% & OE - 8.6%), although with sufficient capital (CAR - 54.9%). The relatively low standard deviations also attest to the fact that the statistics do not vary significantly across the banks.

Furthermore, results on return on assets show an average value of 0.049 with a standard deviation of 7.1%. This suggests that the selected microfinance banks had a positive and steady financial performance during the periods under study. However, this very low value (ROA – 4.9%) is an indication that the banks have not effectively used their assets in generating sufficient profits for their shareholders.

Additional results from Table 4.1 reveal that the skewness of the distribution of the variables are tailed to the right (cost-to-asset & non-performing ratios) and to the left (return on asset & capital adequacy ratio). The kurtosis statistics also reveal that the distributions are approximately leptokurtic (return on asset, cost-to-asset & non-performing loan ratios) and platykurtic (capital adequacy ratio). In addition, the Jarque-bera results show that all the variables have statistics that are not significant at the 5% level ($p > 0.05$). The summary of the normality test results indicates a normal distribution for the data representing all the variables.

4.2 PANEL UNIT ROOT TEST

Table 4.2 shows the results of the unit root test. The Levin and Chu (LLC) test statistics for variables (capital adequacy ratio, non-performing loan ratio, cost-to asset ratio & return to asset) are all significant at the 5% level ($p<0.05$). This implies stationarity at the level stage. Furthermore, the Im Pesaran and Shin test (IPS) test statistics for only two of the variables (cost-to-asset ratio & return to asset) are significant at the 5% level, suggesting stationarity at the level stage. However, the other two variable (capital adequacy ratio & non-performing loan ratio) only attain stationarity after the first difference ($p<0.05$).

Table 4.2: Unit Root Test Results

Variables	Level Stage		First Difference		Comments based on LLC
	LLC	IPS	LLC	IPS	
Capital Adequacy Ratio	-0.18482 [0.0323]	-1.13933 [0.1273]	- -	-2.4717 [0.0067]	Stationary at the level stage I (0).
Non-Performing Loan Ratio	-3.52579 [0.0002]	-1.50880 [0.0657]	-	-2.86841 [0.0021]	Stationary at the level stage I (0).
Cost to asset Ratio	-8.88331 [0.0000]	-1.88880 [0.0295]	-	-	Stationary at the level stage I (0).
Return on Asset	-3.90075 [0.0000]	-3.25832 [0.0006]	-	-	Stationary at the level stage I (0).

Source: Outputs from E-view 9 (2023)

Since the LLC test results usually lead to a more accurate result about the panel integration properties of variables, it therefore adopted as the unit root test for this study. The (IPS) test results only provided additional information on the panel unit root of the study variables. The summary of the test thus indicate that all the variables are stationary at their level stage.

4.3 CORRELATION MATRIX

The correlation results from Table 4.3 indicate the bivariate correlation of the variables under study. It shows that there is a degree of relationship that exist among return on asset, cost-to-asset ratio, non-performing loan ratio and capital adequacy ratio. The summary of the results implies a moderate relationship and that there is no indication of multicollinearity among the variables

Table 4.3: Correlation Matrix

Correlation	Return on Assets	Cost-to-asset ratio	Non-Performing Loan ratio	Capital Adequacy ratio
Return on Assets	1			
Cost-to-asset ratio	0.0103	1		
Non-Performing Loan ratio	-0.1287	0.94733	1	
Capital Adequacy ratio	0.1983	0.2001	0.2476	1

Source: Outputs from E-view 9 (2023)

4.4 HAUSMAN SPECIFICATION TEST

The Hausman test was computed in order to specify which model effect is appropriate for the panel model. Table 4.4 shows the summary of the test result, which indicates a chi-square value of 1.301 having a degree of freedom of 3. However, this value is non-significant at the 5% statistical level ($p=0.73 >0.05$), thus implying a random effect model for the panel estimates.

Table 4.4 - Hausman Test

Model	Test cross-section random effect			
		ROA		
1	Test Summary	Chi-Sq. Statistic	d.f.	Prob
	Cross-section random	1.301006	3	0.7289

Source: Outputs from E-view 9 (2023)

4.5 PARAMETER ESTIMATES

Since the Hausman test has specified a random effect model for the panel model, Table 4.5 gives a summary of the estimates of the model parameters.

Table 4.5 – Random Effect Model Result

	Beta	t-statistics	p-values
Cost-to-asset ratio	0.9950	4.2926	[0.0001] *
Non-Performing Loan ratio	-0.8444	-4.6387	[0.0000] *
Capital Adequacy ratio	0.0712	2.7688	[0.0071] *
Constant term	0.0070	0.4316	[0.6673]
R Square	0.7684		
Adjusted R-Square	0.7383		
F-Statistic	8.9262 [0.0000] *		

Dependent variable: ROA; * Implies Significant at 5%.

Source: Outputs from E-view 9 (2023)

The R-squared value of 0.728 implies that independent variables explained 72.8% of the total variations in the dependent variable (ROA). Similarly, the F-statistics ($F = 8.93$) is significant at the 5% level ($p<0.05$). These results suggest that the explanatory variables jointly and significantly account for the variations in the model.

Furthermore, the regression coefficient of the cost-to-asset ratio ($\beta = 0.995$) is positive, indicating a direct relationship with returns on asset. The t-statistics of the coefficient (t-stat=4.29) is also significant at the 5% level ($p=0.00<0.05$). This implies a direct and significant relationship between cost-to asset ratio (operating efficiency) and returns on asset (financial performance).

Similarly, the coefficient of the non-performing loan ratio ($\beta=-0.844$) is negative, indicating an inverse relationship with returns on asset. The t-statistics (t-stat=-4.63) is also significant at the 5% level ($p=0.00<0.05$). This suggests an inverse but significant relationship between non-performing loan ratio (credit risk) and returns on asset (financial performance).

Additional results from Table 4.5 reveal a positive regression coefficient (β=0.071) for the capital adequacy ratio. The t-statistic of this coefficient (t-stat=2.77) is also significant at the 5% level (p=0.007<0.05). This implies a direct and significant relationship between capital adequacy ratio and returns on asset (financial performance).

5. Summary of Findings

This research investigated the effect of the dimensions of capital adequacy risk (capital adequacy ratio, cost-to-asset ratio & non-performing loan ratio) on the financial performance (retun on assets) of microfinance banks in Nigeria. The empirical results show that capital adequacy ratio directly and significantly affect the financial performance of microfinance banks. This implies that with more capital, microfinance banks in Nigeria will be able to expand their loan and advances to customers, which will in turn increase their profitability. This finding agrees with that of Chinoda et al. (2015); Al-Hadid (2017); Calem and Rob (2019), but fails to agree with those of Qin and Pastroy (2012) and Getahun (2015).

Further empirical findings from this research has shown that operating efficiency (measured as cost-to-asset ratio) has a direct and significant impact on the financial performance of microfinance banks. This suggests that a prudent management of the banks' operating cost is needed to improve performance and hence profits amongs the banks in the country. This is expected for any going-business-concern since a higher cost of running a business is known to reduce a company's bottom-line. The finding here is in tandem with those of Gropp and Heider (2010); Chami and Cosimano (2017); Mehta and Bhavani (2017) and Krishnan et al. (2019). However, it disagrees with the finding of Getahun (2015).

Lastly, the result from the analysis has revealed that credit risk (measured as non-performing loan ratio) has an inverse but significant effect on the financial performance of microfinance banks in Nigeria. This implies that loan defaults must be dealt with if the banks' loan portfolio must thrive. In addition to mismanagement of funds, failure of customers to repay loan obligations is a strong catalyst for failure amongst microfinance banks. This finding is supported by those of Ameur and Mhiri (2013); Otione and Onditi (2016) and Afolabi et al. (2020). However, it fails to agree with those of Li and Zou (2014); Aishatti (2015) and Nguyen et al. (2018).

6. Conclusion and Policy Recommendations

The empirical findings in this research have established capital adequacy ratio as a key determinant of profitability among microfinance banks in Nigeria. This emphasizes the importance of a strong capital base for microfinance banks to keep providing micro-credits to individuals and small businesses. Similarly, results have shown operating efficiency as a major driver of profitability among microfinance banks in Nigeria. This stresses the need for the banks to be deliberate in the efficient management of their operating cost in order to remain profitable. Furthermore, findings in this research have established credit risk (also known as loan default) as a major factor influencing the performance of microfinance banks in Nigeria. This highlights the importance of a functional and effective credit control system, as a prerequisite for giving loans in the country's microfinance banking subsector.

The study concludes that capital adequacy, operating efficiency and credit risk are key risk components affecting financial performance among microfinance banks in Nigeria. Therefore, it is recommended that the government should implement policies and regulation targeted at ensuring effective management of capital/assets in the microfinance banking subsector. A continuous check-and-balance by the CBN will also help to identify erring banks and appropriate sanctions could be meted to owners/management. In addition, stakeholders and decision makers in the banks should run a system that is cost effective, with the sole aim of minimizing the bank's operating cost and while also monitoring loan portfolios to reduce defaults.

The Central Bank of Nigeria should do more in the area of credit reporting system, by encouraging collaborations among microfinance banks, such that any loan defaulter in a particular bank would be flagged and prevented from accessing further loans elsewhere. This will help to drastically reduce the instances of the same loan defaulter, appearing in the books of several banks.

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