

Estimated Panel Data Effect of Capital Adequacy Ratios and Return on Equity of Selected Microfinance Banks in Nigeria

¹Dr. Chituru Wike, ²Dr. Buloh Abelta Kpekpe, ³Dr. Daniel Ikezam Nwonodi
Department of Finance, Rivers State University,
Port Harcourt, Nigeria

DOI: [10.56201/ijbfr.v10.no2.2024.pg93.110](https://doi.org/10.56201/ijbfr.v10.no2.2024.pg93.110)

Abstract

Micro financing is a type of banking service that is provided to unemployed or low-income individuals, or groups who otherwise have no other access to financial services. Ultimately, the goal of microfinance is to give low-income people an opportunity to become self-sufficient by providing a way to save money, borrow money and get insurance. Micro financing provides options to customers with limited resources to promote participation in productive activities or to support a small business. This study examined capital adequacy ratios and performance of quoted microfinance banks in Nigeria. The objective was to investigate the relationship between bank capital adequacy ratios and the return on equity of quoted microfinance banks. Cross sectional data were sourced from Stock Exchange Fact-Book and Financial Statement of the banks from 2013-2021. Return on equity of the microfinance banks were proxy for dependent variable while capital adequacy ratios were proxy by Tier I to Total Capital, Tier II to Total Capital, Adjusted Capital to Risk Assets Ratio, and Capital to Risk Asset Ratio. The Ordinary Least Square (OLS) method of regression, were employed with the aid of E-view statistical package. The study found that Tier 1 capital to Total capital ratio, capital to risk assets ratio, capital to total asset ratio have positive relationship while Tier 2 to total capital ratio and adjusted risk capital ratio have negative relationship. The model summary revealed that the independent variables can explain 64 percent variation on the dependent variable. From the above, the study concludes that capital adequacy ratios have positive and significant relationship with the return on equity of quoted microfinance banks in Nigeria. It recommends that the monetary authority should formulate policies of deepening capital adequacy of microfinance banks and ensure strict compliance to all capital regulatory policies in Nigeria.

Keywords: Capital Adequacy Ratios, Return on Equity, Microfinance Banks, Nigeria

INTRODUCTION

Prior to the Banking Ordinance of 1952, commercial banks in Nigeria operate without any form of regulation. The period where known as the Free Banking Era and was cauterized with high level of banking sector crises as a result of inadequate capital. Historically, the issue of bank capital in Nigeria dates back to the banking ordinance of 1952 when banks were for the first time mandated to have a capital base of £12,500 (Akani & Lucky, 2016). The regulatory authorities have adopted capital adequacy policy as a regulatory tool and constitute the most proactive measures of repositioning the banking industry to achieve its economic and monetary policy objectives.

According prudential guideline for microfinance banks in Nigeria, microfinance banks shall commence operations with, and maintain at all times, a minimum paid-up capital appropriate for its authorization as may be prescribed by the CBN from time to time. The Capital Adequacy Ratio (CAR) of an MFB shall be measured as a percentage of the qualifying capital to its risk weighted assets. MFBs shall maintain minimum CAR of 10 per cent at all times or as may be prescribed by the CBN. An MFB shall maintain a ratio of not more than 1:10 of its shareholders' funds unimpaired by losses to the net credits. The CBN may require an MFB to maintain additional capital as it considers appropriate in respect of specific concentration of risks or market risks or connected lending. MFBs that do not possess adequate capital will be classified and appropriate supervisory actions taken in line with the Supervisory Intervention Framework. The capital adequacy of a bank is rated based upon and not limited to an assessment of level and quality of capital and the overall financial condition of the institution, ability of management to address emerging needs for additional capital, nature, trend, and volume of problem assets, and the adequacy of allowances for loan and lease losses and other valuation reserves and risk exposure represented by off-balance sheet activities.

Financial performance refers to the ability of the management to maximize shareholders wealth. The quantity and quality of earnings can be affected by excessive or inadequately managed credit risk that result in loan losses and require additions to the allowance for loan and lease losses, or by high levels of market risk that may unduly expose an institution's earnings to volatility in interest rates. The quality of earnings may also be diminished by undue reliance on extraordinary gains, nonrecurring events, or favorable tax effects. Future earnings may be adversely affected by an inability to forecast or control funding and operating expenses, improperly executed or ill-advised business strategies, or poorly managed or uncontrolled exposure to other risks. Adequate capital in the banking business will provide the ultimate protection against insolvency and liquidation arising from the risk in the banking business. Bank capital adequacy is important in preventing banks from bankrupt by protecting the stakeholders' interest and capital is seen to be safeguard to protect stakeholders' interest and maintain the stability of banking system of an economy. It is an indicator which reflects the ability of a bank to bear unexpected losses arising in the future and bank leverage (Parvesh & Afronze, 2014). Regulations are aimed at ensuring the safe operation of financial institutions set by both state and federal authorities (Tadesse, 2014). Given the interconnectedness of the banking industry and its reliance on national and global economy, it is important for regulatory agencies to maintain control over standardized practice of these financial institutions (Munene, 2015; Akani & Lucky, 2016). These regulations range from credit risk ratio, interest rate, capital adequacy ratio to liquidity ratio. Adequate capital is required for commercial banks to operate efficiently because it provides protection against failure (Gudmundsson, Ngoka-Kisinguh & Odongo, 2013; Anyamaobi & Lucky, 2017).

The examinations carried out by the Central Bank of Nigeria (CBN) between March to June 2010 revealed that they failed to target their market the active poor (Akani & Lucky, 2016). Consequently, CBN closed down majority of the Micro Finance Banks (MFBs) due to various shortcomings and challenges experienced by the banks at the period. This led to the review of the existing Regulatory and Supervisory Guidelines policy in 2011. In 2013 NDIC in collaboration with the CBN conducted routine examination of 731 MFBs in Nigeria. The examination findings

still revealed that some of the institutions were incapable of honoring their obligations to their customers as at when due. A total of 106 MFBs were subject of serious regulatory concern. Out of that number, MFBs were rendering skeletal services were undergoing restructuring, had voluntarily closed shop while the licenses of 83 others were revoked (Agbola, Acupan & Mahmood, 2017). From the above, this study examined the effect of capital adequacy ratios on the return on equity of selected microfinance banks in Nigeria.

LITERATURE REVIEW

Capital Adequacy Ratio

Since Capital adequacy ratio (CAR) is the ratio that is set by the regulatory authority in the banking sector, and this ratio can used to test the health of the banking system. Hence, capital adequacy ratio for banking organizations is an important issue that has received a considerable attention in finance literature. According to Al-Sabbagh (2004), capital adequacy is defined as a measure of bank's risk exposure. Banks risk is classified into credit risk, market risk, interest rate risk and exchange rate risk that are included in the calculation of capital adequacy ratio. Therefore regulatory authorities used capital adequacy ratio as an important measure of safety and soundness for banks and depository institutions because they view capital as a buffer or cushion for absorbing losses.

CAR also called Capital to Risk (Weighted) Assets Ratio (CRAR) is a ratio of a bank's capital to its risk. It is a measure of the amount of a bank's core capital expressed as a percentage of its 10 risk-weighted asset (Berger et al., 1995). The NBE keep track of a bank's CAR to ensure that it can absorb a reasonable amount of loss and complies with statutory Capital requirements as these ratios are a measure of the amount of a bank's capital in relation to the amount of its credit exposures. They are usually expressed as a percentage. For instance, a capital adequacy ratio of eight (8) percent means that a bank's capital is eight percent of the size of its credit exposures (Alfon et al., 2004; Lucky & Nwosi, 2015). The purpose of having minimum capital adequacy ratios is to ensure that banks can absorb a reasonable level of losses before becoming insolvent, and before depositors funds are lost (Harley, 2011).

Applying minimum capital adequacy ratios serves to promote the stability and efficiency of the financial system by reducing the likelihood of banks becoming insolvent. A bank becoming insolvent may lead to loss of confidence in the financial system, causing financial problems for other banks and perhaps threatening the smooth functioning of financial markets (Soludo, 2009; Lucky, 2017). Therefore, the application of minimum capital adequacy ratios by the central bank assists in maintaining a sound and efficient financial system. It also gives some protection to depositors. In the event of a winding-up, depositors' funds rank in priority before capital, so depositors would only lose money if the bank makes a loss which exceeds the amount of capital it has. Hence, Alashi (2002) observed that the higher the capital adequacy ratio, the higher the level of protection available to depositors.

The capital adequacy principle states that bank's capital should match risks. Since capital is the most scarce and costly resource, the focus of risk monitoring and risk measurement follows. The central role of risk-based capital in regulations is a major incentive to the development of new tools and management techniques. Undoubtedly a most important innovation of recent years in

terms of the modelling toolbox is the VaR concept for assessing capital requirements. The VaR concept is a foundation of risk-based capital or, equivalently, economic capital (Bessis 2002). The VaR methodology aims at valuing potential losses resulting from current risks and relies on simple facts and principles. VaR recognizes that the loss over a portfolio of transactions could extend to the entire portfolio, but this is an event that has a zero probability given the effective portfolio diversification of banks. Therefore, measuring potential losses requires some rule for defining their magnitude for a diversified portfolio. VaR is the upper bound of losses that should not be exceeded in more than a small fraction of all future outcomes. Management and regulators define benchmarks for this small preset fraction, called the „confidence level“, measuring the appetite for risk of banks. Economic capital is VaR based and crystallizes the quantified present value of potential future losses for making sure that banks have enough capital to sustain worst-case losses. Such risk valuation potentially extends to all main risks.

The Basel Committee established in 1974, is a committee that represents central banks and financial supervisory authorities of the major industrialized countries (the G10 countries). The committee concerns itself with ensuring the effective supervision of banks on a global basis by setting and promoting international standards. Its principal interest has been in the area of capital adequacy ratios. In 1988 the committee issued a statement of principles (Basel Capital Accord) dealing with capital adequacy ratios. The statement contains a recommended approach for calculating capital adequacy ratios and recommended minimum capital adequacy ratios for international banks. The Accord was developed in order to improve capital adequacy ratios (which were considered to be too low in some banks) and to help standardize international regulatory practice. This Accord has been adopted by the OECD countries and many developing countries (Basel Committee on Banking Supervision, 2003).

Minimum capital adequacy ratios and its limitations The minimum CAR that supervisory authorities are encouraged to apply according to the Basel Capital Accord are: one, that tier 1 capital to total risk weighted credit exposures should not be less than 4 percent; and: two, that total capital (i.e. tier 1 plus tier 2 less certain deductions) to total risk weighted credit exposures should not be less than 8 percent. Akerlof (1990) observed that having a CAR above the minimum recommended level is not a guarantee that the bank is "safe" as CAR are concerned primarily with credit risks. There are also other types of risks which are not recognized by CAR, for instance inadequate internal control systems could lead to large losses by fraud, or losses could be made on the trading of foreign exchange and other types of financial instruments. Furthermore, CARs are only as good as the information on which they are based. For instance, if inadequate provisions have been made against problem loans, then the CAR will overstate the amount of losses that the bank is able to absorb. Therefore, CAR should not be interpreted as the only indicators necessary to judge a bank's financial soundness.

Introduction to 1988 Basel Accord Basel committee for banking regulations and supervisory practices has been established in 1988. The committee consisted of representatives of the group of ten (G-10) countries which are Canada, France, Germany, Italy, Japan, Sweden, Switzerland, United Kingdom, and United States. The heads of central banks of G-10 countries had met in 7-December 1887 at Basel city to study the first report of Basel committee which tries to establish equilibrium between rules and regulatory actions about measuring the adequacy of capital. So the

report has been published and distributed to the G-10 countries and another countries, to let banks study it for a period of 6 months and to look at the committee and put their final report and presented it in July 1988 which has been agreed upon by the heads of the central banks and was called (Basel accord). The major objective of Basel committee is to reduce fragility of international banking system, and to reduce competitive inequities created by the application of differential standards at the national level (Cornford, 2003). 1988 Capital Accord specified a board range of principles to govern the division of supervisory responsibilities between parent and host banking supervisory authorities in G-10 countries. It was last amended in 1983 and is widely applied today in financially developed countries.

Measurement of Bank Capital Adequacy Ratio

Traditionally, bank capital is measured by Capital Assets Ratio (CAR). The banking sector crisis prior to the establishment of Nigerian Deposit Insurance Corporation (NDIC) may have been examined using this ratio.

Capital to Deposit Ratio: The banking Act of 1969 provided that the paid-up capital and statutory reserve of banks operating in Nigeria should not fall below 10% of a bank's total deposit. It is expected that for every unit of deposit liabilities there should be at least 1 unit of bank Capital for the protection of the deposit. There has been criticism about this ratio. Opponent of the ratio argued that it will lead to fall in the operating profit of the banks as significant proportion of the bank's capital will held in idle cash or near cash which is low interest income. The principle of striking balance between liquidity, safety and liquidity by banks would not be achieved if higher level of cash or near cash instruments were kept by banks (Lucky & Akani, 2017).

Equity Capital- Total Assets Ratio: The ratio of equity capital or primary capital to total assets is another good measure for the capital adequacy of banks. A high ratio position the bank in a better measure to absorb shocks in the operating environment.

Capital to Risk Assets Ratio: Bank operation and the operating environment is characterized with risk, this ratio measures the depth of exposure of a bank to risk assets and the number of times risk assets can be covered by capital, the higher the ratio of risk assets to total capital, the worse the capital adequacy disposition of the bank.

Adjusted Capital to Risk Assets Ratio: This ratio is used to measure the strength of adjusted capital to risk assets of the bank. Adjusted capital is defined as: Total Capital (AC) - (55% Bank Premises) Risk Assets (R.A) is calculated as: Total Assets - (Liquid Assets + 55% Bank premises) Therefore $AC - RA \text{ Ratio} = TC - (55 \text{ BP})$

$TA - (LA + 55 \text{ BP})$

Adjusted Equity Capital to Risk Assets Ratio: This is the variant of the adjusted capital to risk assets ratio. It indicates the extent to which a unit of adjusted equity capital is able to cover a unit or units of risk assets at a given period of time. Adjusted equity capital is defined as: Total Capital - (Subordinated notes + debentures + 55% Bank premises).

Capital to Weighted Risk Assets: Bank assets differ and the degree of risk also differs. Appropriate weight can be assigned to match each class of bank assets according to the perceived degree of risk exposure of the assets with the assets quality. This was adopted by the Basle of International settlement to determine the standard of Bank capital adequacy.

Capital -Net Loans and Advances Ratio: This measures bank capital to loans and advances in the banking system. This rating is influenced by the monetary and macroeconomic condition of the country.

The Basel Capital Accord

Tier 1 Capital This includes only permanent shareholders' equity (issued and fully paid ordinary shares/common stock and perpetual non-cumulative preference shares) and disclosed reserves (created or increased by appropriations of retained earnings or other surpluses). In the case of consolidated accounts, this also includes minority interests in the equity of subsidiaries which are not wholly owned. This basic definition of capital excludes revaluation reserves and cumulative preference shares (Akani & Lucky, 2016). There is no limit on the inclusion of Tier 1 capital for the purpose of calculating regulatory capital. For this purpose, the equity shares with the following characteristics are included in Tier 1 capital: Issued directly by the bank;

- i. Clearly and separately identified in the balance sheet –
- ii. Have no maturity (are perpetual);
- iii. Fully paid;
- iv. Cannot be refunded beyond the possibility of the liquidation of bank or reduction of share capital;
- v. Do not give to the holder rights to a minimum remuneration nor are there any clauses that require the compulsory payment of dividends.
- vi. The dividends are paid solely out of distributable profits or retained earnings distributable; classified as equity instruments in accordance with IFRS.

Tier 2 Capitals

Revaluation Reserve

Fixed Asset Revaluation Reserve: This relates to revaluation of fixed assets in line with market values reflected on the face of the balance sheet. Prior approval of the CBN must be obtained by any bank before the recognition of the revaluation surplus on fixed assets in its books, which can only be done taking into consideration the following:

- i. The valuation must be made by qualified professionals and the basis of the revaluation as well as the identities of the values must be stated.
- ii. The difference between the market and historic values of the eligible fixed assets being revalued shall be discounted by 55%.
- iii. The revaluation of fixed assets is applicable to own premises only; and
- iv. The revaluation of fixed assets (own premises only) is permissible within a minimum period of seven years after the date of the purchase of the asset or the last revaluation.

Other revaluation reserves: The inclusion of other revaluation reserves created by the adoption of the international Financial Reporting Standards (IFRS) as part of the Tier 2 capital shall be subject to the limitations that will be specified by the CBN from time to time.

General provisions/General loan-loss reserves: For the purpose of the standardized credit risk measurement approach, provisions or loan-loss reserves held against future (presently unidentified), losses are freely available to meet losses which subsequently materialize and therefore qualify for inclusion in Tier 2 capital. Provisions ascribed to specific or identified deterioration of particular assets or known liabilities, whether individual or grouped (collective), are excluded. Furthermore, general provisions/general loan-loss reserves eligible for inclusion in

Tier 2 will be limited to a maximum of 1.25 percentage points of credit risk weighted assets and subject to the approval of the CBN.

Hybrid (Debt/equity) capital instruments: These include financial instruments which combine characteristics of equity and debt capital. Essentially, they should meet the following requirements:

- i. They are unsecured, subordinated and fully paid-up;
- ii. They are not redeemable at the initiative of the holder or without the prior consent of the CBN.
- iii. They are available to participate in losses without the bank being obliged to cease trading (unlike conventional subordinated debt);
- iv. Although the capital instrument may carry an obligation to pay interest that cannot permanently be reduced or waived (unlike dividends on ordinary shareholders equity), it should allow service obligations to be deferred (as with cumulative preference shares) where the profitability of the bank would not support payment.
- v. Hybrid capital instruments that are redeemable must have a maturity of at least 10 years. The contract must clearly specify that repayment is subject to authorization by the Central Bank of Nigeria. Cumulative preference shares, having these characteristics, would be eligible for inclusion in this category.

Subordinated term debts Subordinated debts issued by banks shall form part of the Tier 2 capital provided that the contracts governing their issue expressly envisage that:

- i. In the case of the liquidation of the issuer, the debt shall be repaid only after all other creditors not equally subordinated have been satisfied.
- ii. The debt has an original maturity of at least five years; where there is no set maturity; repayment shall be subject to at least five years' prior notice.
- iii. Early repayment of the liabilities may take place only at the initiative of the issuer and shall be subject to approval of the CBN.
- iv. The contracts shall not contain clauses whereby, in cases other than those referred to in points a) and c), the debt may become redeemable prior to maturity.
- v. During the last five years to maturity, a cumulative discount (or amortization) factor of 20% per year will be applied to reflect the diminishing value of these instruments as a continuing source of strength. Unlike instruments included in hybrid capital above, these instruments are not normally available to participate in the losses of a bank which continues trading. For this reason, these instruments will be limited to a maximum of 50% of Tier 1 Capital.

Micro Finance Bank

The term microfinance refers to the provision of financial services (generally savings and credit) to low-income clients. The clients are often identified as traders, street vendors, small farmers, service providers (hairdressers, rickshaw drivers), and artisans and small producers, such as blacksmiths and seamstresses (Ledgerwood, 1999). Microfinance is more than micro credit. Microfinance includes a range of financial services such as savings, credit, money transfers and insurance, among other things for poor and low-income people. For credit to be of help to people,

the recipient should have the capacity to service the credit, in addition to having an intention to do so. According to Central Bank of Nigeria (2004), microfinance is about providing financial services to the poor who are traditionally not served by the conventional financial institution. Robinson (2001) points out that the term microfinance refers to small-scale financial services, primarily credit and savings, provided to people who farm or fish or herd; who operate small enterprises or micro-enterprises where goods are produced, recycled, repaired, or sold; who provide services; who work for wages and commissions; who gain income from renting out small amounts of land, vehicles, draft animals, or machinery and tools; and other individuals and groups at the local levels of developing countries, both rural and urban areas. Akanji (2001) asserted that microfinance is the provision of very small loans (micro credit) to the poor, to help them engage in new productive business activities and/or to grow/expand existing ones. The author further states that microfinance recognizes the peculiar challenges of micro enterprises of their owners and the inability of the poor to provide tangible collateral and therefore promotes collateral substitution. Disbursement and repayment are structured to suit credit needs and cash flow patterns of small business. There are three features that distinguish microfinance products from other formal financial products. These are: (i) the smallness of loans granted or savings collected; (ii) the absence of asset-based collateral; and (iii) simplicity of operation. The Central Bank of Nigeria (2004b) recognizes that the existence of informal institutions which are under its control and supervision through policy formulation would not only enhance monetary stability, but will expand the financial infrastructure of the country to meet the financial requirements of the micro, small and medium enterprises. The objectives of the microfinance institutions in Nigeria include:

- (i) Promotion of rural development through financial intermediation
- (ii) Stimulation of productive activities in the rural sector,
- (iii) Development of banking habits in rural dwellers and ensuring the development of an integrated national financial system, and
- (iv) Improving the economic status of small scale producers in the rural and urban areas (Central Bank of Nigeria, 2008).

Finance theory readily lends itself to the micro credit delivery model, which is the pre-occupation of the microfinance paradigm. Iniodu and Ukpak (1996) pointed out that finance is an indispensable tool in development. They opined that a poorly developed financial system is an obstacle to the development of wealth, enhancement of socio-economic welfare and promotion of human dignity. Thus, the provision of financial support through credit and savings for the acquisition of capital goods is crucial for effective economic management. Microfinance institutions also stimulate savings and asset accumulation. The empirical and anecdotal evaluation of many microfinance institutions reports conclusively, from the clients perspective that learning to save and having a safe place to keep those savings are principal benefits of the microfinance institutions (Odejide, 1997). Thus, microfinance has demonstrated ability to build up capacity of people and communities; as well as make a significant and social development in developing countries.

Micro financing is a type of banking service that is provided to unemployed or low-income individuals, or groups who otherwise have no other access to financial services. Ultimately, the goal of microfinance is to give low-income people an opportunity to become self-sufficient by providing a way to save money, borrow money and get insurance. Micro financing provides options to customers with limited resources to promote participation in productive activities or to support a small business. Micro financing is a source of financial services for entrepreneurs and small businesses lacking access to banking and related services. The two main mechanisms for the delivery of financial services to such clients are: (1) relationship-based banking for individual entrepreneurs and small businesses; and (2) group-based models, where several entrepreneurs come together to apply for loans and other services as a group.

It is a broad category of services, which includes microcredit. Microcredit is provision of credit services to poor clients. Microcredit is one of the aspects of microfinance and the two are often confused. Critics may attack microcredit while referring to it indiscriminately as either 'microcredit' or 'microfinance'. Due to the broad range of microfinance services, it is difficult to assess impact, and very few studies have tried to assess its full impact. Proponents often claim that microfinance lifts people out of poverty, but the evidence is mixed. What it does do, however, is to enhance financial inclusion. Like conventional banking operations, microfinance lenders must charge interest on loans, and they institute specific repayment plans with payments due at regular intervals. Not all applicants qualify, depending on the amount of default risk the institution attributes to potential borrowers and the terms of the loans for which the borrowers are applying.

Buffer Theory of Capital Adequacy

The objective of ensuring that bank capital is adequate is to withstand and absorb monetary and macro-economic shocks which bank operation is very sensitive. However, banks may prefer to hold a buffer of excess capital to reduce the profitability of falling under the legal capital requirements, especially if their capital adequacy ratio is very volatile (Ikpefan, 2013). Capital adequacy has in recent time gone beyond that of banking supervision instrument and become a monetary policy tool of achieving financial stability. Section 7 (2) of BOFIA states that any banks that fail to comply with the capital adequacy within such period as may be determined by the CBN shall be a ground for revocation of license (Lucky & Tamunoiduabia, 2022). Section 13 states that bank shall maintain at all times capital funds unimpaired by losses in such ratio to all or any assets or to all or any liabilities or both such assets and liabilities of the bank and all its offices in and outside Nigeria as may be specified by CBN. The revocation of some banks license in 2005 after the consolidation and recapitalization reforms were reference to these sections. The buffer theory of Calem and Rob (1996) predicts that a bank approaching the regulatory minimum capital ratio may have an incentive to boost capital and reduce risk in order to avoid the regulatory costs triggered by a breach of the capital requirement. The collapse of some Nigerian Banks has been traced to high risk taking couple with poor capitalization.

Empirical Review

Akani and Lucky (2015) examined capital adequacy ratios and the impact on the profitability of Commercial Banks in Nigeria from 1980 – 2013. The objective is to investigate whether there is a dynamic long run relationship between capital adequacy ratios and the profitability of commercial

banks. Time series data were sourced from Stock Exchange factbook and financial statement of quoted commercial banks and the Johansen co-integration techniques in vector error correction model setting (VECM) as well as the granger causality test were employed. The study has Return on Asset (ROA), Return on Investment (ROI) and Return on Equity (ROE) as the dependent variables and the independent variables are Adjusted Capital to Risk Asset Ratio (ACRR), Capital to Deposit Ratio (CTD), Capital to Net Loans and Advances Ratio (CNLAR), Capital to Risk Asset Ratio (CRA) and Capital to Total Asset Ratio (CTAR). The empirical result demonstrated vividly in the models that there is a positive long run dynamic and significant relationship between return on asset and capital to risk asset ratio and capital to deposit ratio while others are negatively correlated. The findings also revealed that there is bi-directional causality running from ROA to ACRR and ROA to CNLAR.

Lucky and Nwosi (2015) investigated the relationship between asset quality and the profitability of the fifteen (15) quoted Deposit Money Banks in Nigeria from 1980- 2013 using Secondary data were sourced from annual reports of the quoted Deposit Money Banks. Multiple regressions with econometric view statistical package were employed as data analysis method. The Ordinary Least Square properties of Augmented Dickey Fuller Test, Co-integration and Granger Causality test were used to ascertain the short and long-run relationship between the dependent and the independent variables. Findings from the regression result showed that percentage of Loan Loss Provision to Total Loans has a negative relationship with Return on Investment of the Deposit Money Banks. The study suggests that bank lending environment should be well examined before and after credit. Also, the regulatory authorities are enjoined to ensure sound bank lending environment to avoid the incidence of non-performing loans to improve the profitability of Deposit Money Banks in Nigeria.

Mwongeli (2016) determined if there was a relationship between regulations and financial performance. Capital adequacy was one of the independent variables while financial performance is the dependent variable. This study was a descriptive design. The population of study was the 43 commercial banks in Kenya and the period of study was between 2010 and 2015. Chi square test of independence was used to analyze the relationship between the two variables. The study found out that most of the banks had complied with the minimum capital requirement and the government must continue to ensure that there is compliance of the stipulated guidelines in order to ensure the stability of the banking sector in Kenya. This will enable Kenya as an economy avoid financial crisis. This research determined whether the period from 2014-2016, regulations have affected financial performance of second tier commercial banks.

Karanja and Nasieku (2016) examined the effect of capital on the financial performance of commercial banks in Kenya. The study adopted a descriptive research design. The target population was the listed commercial banks in Kenya as licensed by the Central Bank of Kenya as of 2014. The study was based on secondary data retrieved from the banks' annual audited financial reports spanning 5 years between 2010 and 2014. The study was based on quantitative data. Pearson's Correlation Coefficient analysis was used to test the strength of the relationship between the dependent and independent variables. Multiple regression analysis was used to test the effect of the capital variables on the financial performance of the commercial banks in Kenya. Study findings showed that the core capital to total risk weighted assets for the Tier I banks decreased

from 2010 to 2014 while that of the Tier II banks decreased from 2010 to 2014. Findings also showed that the total capital to total risk weighted assets for the Tier I banks decreased from year 2010 to year 2014 while that of the Tier II banks decreased from year 2010 to year 2014. Findings further showed that Tier I and Tier II banks maintained their core capital to total risk weighted assets ratios and their total capital to total risk weighted assets ratios at a significantly higher level than the set minimum requirement of 8% and 12%, respectively. Empirical studies examined above failed to consider the problem of microfinance banks as this study focused on the effect of capital adequacy ratios on the return on equity of selected microfinance banks in Nigeria.

METHODOLOGY

This study used quasi experimental research design approach for the data analysis. This approach combines theoretical consideration (a prior criterion) with the empirical observation and extract maximum information from the available data. It enables us therefore to observe the effects of explanatory variables on the dependent variables. However, for the purpose of this study, the secondary data collection method was used, and the multiple regressions. The two-tailed test was used in testing the hypotheses formulated. The study adopted the purposive sampling methods to study the 10 quoted microfinance banks. The two types of data collection method are the primary and the secondary data source from published material such as Central Bank of Nigeria Statistical Bulletin and annual report which is known as secondary data. The data in this study will be sourced from the financial statement of banks and Central Bank of Nigeria Statistical Bulletin.

Model Specification

$$ROE = f(TIER1/TC, TIERII/TC, ACRR, CRA) \quad (1)$$

Transforming equation 1 to econometrics form, we have:

$$ROE = \alpha_0 + \alpha_1 TIER1/TC + \alpha_2 TIER II/TC + \alpha_3 ACRR + \alpha_4 CRA + \mu \quad (2)$$

Where:

ROE	=	Return on Equity
TIER1/TC	=	Tier I to Total Capital
TIERII/TC	=	Tier II to Total Capital
ACRR	=	Adjusted Capital to Risk Assets Ratio
CRA	=	Capital to Risk Asset Ratio
$\alpha_0, \beta_0, \chi_0$	=	Regression Intercept
μ	=	Error term

Data Analysis Method

The method of data analysis to be used in this study was the panel data multiple linear regressions using Ordinary Least Square (OLS) method. The study adopts the panel data method of data analyses which involve the fixed effect, the random effect and the Hausman Test. This approach, which is a quantitative technique, includes tables and the test of the hypotheses formulated by using ordinary least square regression analysis at 5% level of significance. To arrive at a result that will not lead to spurious regressions, the study will test for stationarity at different levels in the variables making up the model. Other tests that will be carried out on the model include test of Normality, Durbin Watson Test of serial correlation, test of heteroskedasticity and test of model specification so as to achieve the objectives of our study as well as answer the research question

and hypotheses. Moreover, in order to undertake a statistical evaluation of our analytical model, so as to determine the reliability of the results obtained and the coefficient of correlation (r) of the regression, the coefficient of determination (r^2), the student T-test and F-test will be employed.

Fixed Effect, Random Effect and FGLS Ordinary Least Square (OLS) is usually used to estimate the parameters of a single equation model. Besides, the estimator yields estimates that are best, linear, and unbiased estimators (BLUE) with the desirable properties of consistency, efficiency and being unbiased. However, these properties are made possible after all the assumptions of the OLS method have been satisfied, (Ifuero and Chijuka 2014). By following the path of (Jim, Eric, Tom and Choi 2006) in estimating the equation for the study, Feasible Generalized Least-Squares (FGLS) procedure was used in confirming further the output of FE model instead of applying the method of ordinary least squares (OLS) because estimators of the former (FGLS) are more efficient with a large sample.

A-priori Expectation of the Result

The elasticity parameter also known as the a-priori expectation of the variables proposes that an increase in the independent variables return on equity. Therefore it can be mathematical stated as follows:- $\alpha_1, \alpha_2 < 0, \alpha_3 > 0$

ANALYSIS AND DISCUSSIONS OF FINDINGS

Table 1: Presentation of Pooled Effect Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TIER1	0.003043	0.008229	0.369719	0.7120
TIER2	-0.059116	0.079068	-0.747664	0.4555
CRA	-0.009101	0.003641	-2.499318	0.0132
ACRR	0.010805	0.017574	0.614863	0.5393
C	34.73163	1.307675	26.55982	0.0000
R-squared	0.035413	Mean dependent var		13.48000
Adjusted R-squared	0.001125	S.D. dependent var		3.104893
S.E. of regression	3.106639	Akaike info criterion		5.147465
Sum squared resid	1273.959	Schwarz criterion		5.274736
Log likelihood	-349.1751	Hannan-Quinn criter.		5.199185
F-statistic	0.969213	Durbin-Watson stat		1.957794
Prob(F-statistic)	0.439137			

Table 2: Presentation of Fixed Effect Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TIER1	0.802271	0.010381	2.218794	0.0271
TIER2	0.611128	0.114236	2.097411	0.0325
CRA	0.734919	0.012475	2.394350	0.0338
ACRR	-0.009044	0.022360	-0.404479	0.6864
C	34.26306	1.912073	17.91933	0.0000
Effects Specification				
			S.D.	Rho
Cross-section random			0.000000	0.0000

Idiosyncratic random		3.089154	1.0000
Weighted Statistics			
R-squared	0.735413	Mean dependent var	13.48000
Adjusted R-squared	0.601125	S.D. dependent var	3.104893
S.E. of regression	3.106639	Sum squared resid	1273.959
F-statistic	9.969213	Durbin-Watson stat	1.957794
Prob(F-statistic)	0.009137		
Unweighted Statistics			
R-squared	0.035413	Mean dependent var	13.48000
Sum squared resid	1273.959	Durbin-Watson stat	1.957794

Table 3: Presentation of Random Effect Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TIER1	0.000290	0.010492	0.027654	0.9780
TIER2	-0.057941	0.074523	-0.777491	0.4379
CRA	-0.010084	0.003368	-2.993803	0.0031
ACRR	0.020747	0.016985	1.221509	0.2235
C	34.51742	1.232530	28.00533	0.0000

Effects Specification

Cross-section fixed (dummy variables)				
R-squared	0.640171	Mean dependent var		13.48000
Adjusted R-squared	0.410113	S.D. dependent var		3.104893
S.E. of regression	3.089154	Akaike info criterion		5.220904
Sum squared resid	1135.602	Schwarz criterion		5.623931
Log likelihood	-341.2424	Hannan-Quinn criter.		5.384684
F-statistic	4.077754	Durbin-Watson stat		2.176062
Prob(F-statistic)	0.002724			

Source: Extract from E-View 9.0, 2024

Table 4: Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	10.179027	5	0.0403

Source: Extract from E-View 9.0, 2024

Our study used the likelihood ratio test to choose between the Pooled effect model and the fixed effects model as how in table 4 above. The fixed effects model is better than pooled effect that the results of the likelihood ratio test were significant ($p\text{-value} < 0.0000$ for the three models). This result means that we reject the Pooled effect model and choose the fixed effects model for this study. To make a choice between the fixed effects model and the random effects model, we utilized the Hausman test as shown in the table above. The hypotheses of the test are as follows: The fixed effects model is more appropriate than the random effects model. As the result found that the results of this test were significant ($p\text{-value} = 0.0241$). Hence, we reject the null hypothesis and conclude that the fixed effects model is the most appropriate of the three models.

Discussion of Findings

The estimated panel data regression model found that capital adequacy of the microfinance banks explained 73.5 and 60.1 percent on the return on equity of the ten microfinance banks within the periods of the study; the model was statistically significant when examined by the value of f-statistic and probability while the Durbin Watson proved the absence of serial autocorrelation. The beta coefficient of the estimated model found that tier I capital added 0.8 percent to return on equity of the microfinance banks; tier II capital added 0.6 percent while capital to risk assets added 0.63 percent while adjusted capital to risk assets ratio reduced return on equity by 0.009 percent over the periods. The positive effects of the variables confirm our expectations and the objective of bank capital adequacy which is to withstand and absorb monetary and macro-economic shocks which bank operation is very sensitive to monetary and macroeconomic factor. However, banks may prefer to hold a buffer of excess capital to reduce the profitability of falling under the legal capital requirements, especially if their capital adequacy ratio is very volatile (Ikpefan, 2013). The positive effect of Tier I capital validates the opinion of Gordon on capital structure relevance as opposed to Miller and Modigliani on capital structure irrelevance. It confirms the empirical findings of Akani and Lucky (2015), on the effects of capital adequacy ratios and its impacts on the profitability of listed commercial banks in Nigeria. It is in line with the findings of Tanaka (2002) on the effects of capital structure on commercial banks performance and the findings of Chen (2003) on the relationship between capital structure and the performance of commercial banks in China. However, Tier II capital and capital to risk assets have negative relationship with profitability of Nigeria commercial banks, the finding is contrary to the expectation of the results and validates the irrelevance theory of Miller and Modigliani, it is also contrary to the various capital regulatory framework as formulated by Basel I, II and III. The negative effects of the variables of banks profitability can be traced to poor compliance to capital adequacy regulation. Section 12 (1) of Bank and Other Financial Institution Act (1991) as amended empowered the Central Bank of Nigeria to regulate capital structure of commercial banks and enforce compliance. The section also give CBN power to revoke banking license for any bank whose capital is less as stipulated by the regulatory authority, this led to the revocation of some banks license in 2005 after the consolidation and recapitalization reforms. The negative effect of the variables can also be traced to monetary and macroeconomic policies such as the withdrawal of all public funds from the banking industry to control excess liquidity and the Treasury Single Account to control fraud.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study examined the effect of capital adequacy ratios and return on equity of selected microfinance banks in Nigeria. That Tier 1 capital to total capital has positive and significant relationship with the return on equity Nigerian quoted microfinance banks. That Tier 2 capital to total capital has positive and significant effect on the return on equity of the selected microfinance banks over the period covered in this study. The study concludes that capital to risk assets ratio has positive and significant effect on return on equity of the selected microfinance banks. Adjusted capital to risk assets ratio have negative but insignificant effect on the return on equity microfinance banks. The model summary found that 73.5 and 60.1 percent variation on Return on equity of the microfinance banks can be explained by variation on the independent variables while

the F-statistics proved that the model is significant, therefore the research conclude that capital adequacy ratios have significant relationship with the return on equity of the selected microfinance banks in Nigeria.

Recommendations

The study makes the following recommendations;

- i. The microfinance capital base should further be reviewed and increase to enhance the operational efficiency of the banks for better profitability performance and there should be full compliance to all capital adequacy reforms by the microfinance banks to edge and protect the banks against shocks and losses that will affect negatively the profitability performance of the banks.
- ii. The regulatory authorities should formulate policies that will enhance the Tier 1 capital of the listed microfinance banks and regulatory capital of the banking industry should be enhanced and risk assets should be reduced from the portfolio of the microfinance banks.
- iii. The management of microfinance banks should have the habit efficiency and effectiveness in bank management to reduce operational and administrative cost of the banking sector to enhance profitability. There should be effective risk management mechanism in the banking sector to leverage banks the negative effect of risk assets on the profitability of the banks.
- iv. There should be effective intermediation mechanism from the microfinance banks to enhance deposit mobilization for better performance. The capital market should be deepened to enhance mobilization of Tier 1 and Tier 2 equity capital for the microfinance banks.

REFERENCES

- Akani, H. W., & Lucky, A. L., (2015). Econometric analysis of capital adequacy ratios and the impact on profitability of commercial banks in Nigeria. *IOSR Journal of Economics and Finance*, 6 (6), 11 – 24.
- Akani, H. W., & Lucky, A. L., (2016). Capital Structure and Shareholders Value of Commercial Banks in Nigeria: A Multi-Variate Study Analysis. *IIARD International Journal of Economics and Business Management*, 2 (5), 1 – 24.
- Anyamaobi, C., & Lucky, A. L., (2017). Corporate characteristics and value creation: a panel data evidence of Nigeria quoted manufacturing firms. *World Journal of Finance and Investment Research*, 2(1), 31-49.
- Anyamaobi, C., & Lucky, A. L., (2017). Corporate characteristics and value creation: A panel data evidence of Nigeria quoted manufacturing firms. *World Journal of Finance and Investment Research*, 2(1), 31-49.
- Berger, A.N., & Bouwman, C. H. (2013). How does capital affect bank performance during financial crises? *Journal of Financial Economics*, 109(1), 146-176.

- Bichanga, W. O. (2015). Effects of central bank of Kenya prudential regulations on financial performance of commercial banks operating in Kisii County. *International Journal of Social Sciences Management and Entrepreneurship* 2(1), 262-273.
- Cornett, S. A. (2004). New evidence from the financial crisis. *Journal of banking*, 56-67.
- Ezike, J. E., & Oke, M.O. (2013). Capital adequacy standards, Basle accord and bank performance: the Nigerian experience (a case study of selected banks in Nigeria). *Asian economic and financial review*, 3 (2), 146-159
- Faezah, Nor (2007). Evaluation of capital adequacy ratio of commercial bank in Malaysia based on basel II Accord. Msc thesis, Utara university, Malaysia.
- Fanta, ashenafi Beyene, Kemal, Kelifa Srmon and Waka, Yodit Kassa (2013). Corporate governance and impact on bank performance. *Journal of Finance and Accounting*, 1(1), 19-26. 66
- Francis, William B. and Osborne, Matthew (2010). On the Behavior and Determinants of Risk-Based Capital Ratios: Revisiting the Evidence from UK Banking Institutions. *International Review of Finance*, 10(4), 485–518.
- Gathigia, J. M. (2016). Effect of Financial Risk on Financial Performance of Commercial Banks in Kenya (D.Phil. Thesis). Jomo Kenyatta University of Agriculture and Technology.
- Gudmundsson, R., Ngoka-Kisinguh, K., & Odongo, M. T. (2013). The Role of Capital Requirements on Bank Competition and Stability: The Case of the Kenyan Banking Industry. Kenya Bankers Association-KBA Centre for Research on Financial Markets and Policy Working Paper Series.
- Karanja, J. S., & Nasieku, T. (2016). Effect of Capital on the Financial Performance of Commercial Banks in Kenya. *Asian Journal of Business and Management*, 4(5), 221-238.
- Karemera J. M. V. (2013). The Relationship between Regulation and Financial Performance of Rwanda Commercial Banks (MBA Project). University of Nairobi.
- Kikoko, A. I. (2011). Credit Risk Management and Profitability of Commercial Banks: A Case Study of Barclays Bank. Research Report:
- Lucky, A. L & Akani, H. W., (2017). Comparative analysis of commercial banks soundness: A CAMELS study of Nigerian pre and post consolidation era. *Research journal of finance and accounting*, 8(20), 149-173.
- Lucky, A. L., Tamunoiduabia, I.F, (2022). Prudential stress test of capital adequacy of quoted commercial banks in Nigeria: A panel data approach: *IIARD International Journal of Banking and Finance*, 8 (4), 48 –66.

- Lucky, A. L., & Akani, H. W., (2017). Comparative analysis of commercial banks soundness: A CAMELS study of Nigerian pre and post consolidation era. *Research Journal of Finance and Accounting*, 8(20), 149-173.
- Lucky, A.L., (2017). Prudential determinants of commercial banks soundness in Nigeria. MSC thesis Submitted to Postgraduate schools Rivers State University of Science and Technology
- Lucky, A. L., & Nwosi, A. A., (2015). Asset quality and profitability of commercial banks: Evidence from Nigeria. *Research Journal of Finance and Accounting*, 6 (18), 27 – 34.
- Maigwa, C., & Mouni, G. (2016). Influence of Interest Rates Determinants on the Performance of Commercial Banks in Kenya. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 6(2), 122-133.
- Makerere University. Kou, J. V. (2008). Timeliness of spread implied ratings. *Financial management*, 503-527.
- McAleer, M. (2009). The ten commandments for optimizing value at risk and daily capital charges. *Journal of economic surveys*, 831-849.
- Munene, P.M. (2015). Effects of Central Bank Regulatory Requirements on Financial Performance of Commercial Banks in Kenya (Doctor of Philosophy Thesis). Jomo Kenyatta University of Agriculture and Technology.
- Mwongeli, J.A. (2016). The Effect of Regulations on Financial Performance of Commercial Banks in Kenya (MBA Project). University of Nairobi.
- Naceur, S. B., & Omran, M. (2011). The effects of bank regulations, competition, and financial reforms on banks' performance. *Emerging markets review*, 12(1), 1-20.
- Ochieng, J.O. (2014). The Effect of Central Bank of Kenya Prudential Guidelines and Regulations on the Financial Performance of Commercial Banks in Kenya (MBA Project). University of Nairobi.
- Odunga, R. M., Nyangweso, P. M., & Nkobe, D. (2013). Liquidity, capital adequacy and operating Efficiency of Commercial Banks in Kenya Research. *Journal of Finance and Accounting*, 4(8), 76-80.
- Ogboi, C., & Unuafe, O. K. (2013). Impact of Credit Risk Management and Capital Adequacy on the Financial Performance of Commercial Banks in Nigeria. *Journal of Emerging Issues in Economics, Finance and Banking*, 2(3), 703-717.
- Olaoye Festus Oladipupo and Olarewaju Odunayo M (2015): Determinants of Deposit Money Banks' Profitability in Nigeria. *Kuwait Chapter of Arabian Journal of Business and Management Review* 4(9), 34-59.
- Olawale Femi Kayode et al. (2015). Credit Risk and Bank Performance in Nigeria. *IOSR Journal of Economics and Finance* 6(2), 189-199.

- Oleka D. Chioma, Eyisi S. Adanma and Onyeze N. Clementina (2014). Empirical Study of the Impact of Inflation on Bank Performance: Implication for Investment Decision Making in Banking Industry in Nigeria. *Humanity & Social Sciences Journal* 9 (2), 189-199.
- Onaolapo A. A. and Adebayo, E. O. (2012). Effect of Capital Adequacy on the Profitability of Nigerian Banking Sector, *Journal of Money, Investment and Banking*, 2(4), 189-199.
- Onje, F., & Oloko, M. (2016). Influence of Strategic Alliance on Financial Performance of Commercial Banks in Kenya. *International Journal of Social Sciences and Information Technology*, 2(4), 503-519.
- Sentero, D. R. (2013). The Effect of Capital Adequacy Requirements on the Efficiency of Commercial Banks in Kenya (Unpublished Thesis). University of Nairobi.
- Shehu Usman Hassan and Abubakar Ahmed (2012). Ownership Structure and Opportunistic Accounting: A Case of Listed Food and Beverage Firms in Nigeria. *International Journal of Physical and Social Sciences*, Volume 2, Issue 7
- Shehu Usman Hassan and Musa Adeiza Farouk (2014). Firm Attributes and Earnings Quality of listed Oil and Gas Companies in Nigeria, *Research Journal of Finance and Accounting*. Vol. 5, No. 17.
- Thumbi, G. (2013). Effects of Credit Risk and Working Capital on Capital Adequacy for Commercial Banks in Kenya (MBA Project). University of Nairobi.
- Triyuwono, Iwan, Ismail, Munawar and Rahman, Aulia F. (2013). Determinants of capital adequacy ratio in Indonesian Islamic Commercial Banks. *Global Review of Accounting and Finance*, 4(1), 159 – 170.
- Tuzcu SE (2015). The Effect of Derivatives Activity on Bank Profitability Before and During The Subprime Mortgage Crisis: Evidence from Turkey', Ankara Üniversitesi Sosyal Bilimler Dergisi.
- Valentina Flamini, Calvin McDonald and Liliana Schumacher (2009). The Determinants of Commercial Bank Profitability in Sub-Saharan Africa. IMF Working Paper.
- William Bentum (2012). The Determinants of Profitability of the Deposit Money Banks in Ghana during the Recent Years of Global Financial Crisis, Master Thesis. Aarhus School of Business.
- Yona, L., & Inanga, E. (2014). Financial sector reforms in bank regulations and supervision and its impact on service quality of Commercial Banks in Tanzania. *European Journal of Business and Management*, 6(2), 45-57.