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RISK-ASSETS QUALITY AND FINANCIAL PERFORMANCE OF QUOTED DEPOSIT MONEY BANK IN NIGERIA

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ABSTRACT

This study empirically explores the effect of risk asset quality through the non-performing loans on the financial performance of quoted deposit money banks. Data on different type of asset quality and financial performance from 2000-2020 were collected from website of the quoted deposit money banks, central bank of Nigeria reports and Nigeria stock exchange. Ordinary least square regression analysis, descriptive statistics, autoregressive distribution lag, co-integration, granger casualty, unit root test and error correction model were used in analyzing the data with the aid of E-view version 12. The study observed that non-performing loan shows a negative and significant influence on the return on asset of sampled deposit money banks in Nigeria.The study concludes byreaffirming the importance of maintaining high-quality assets for deposit money banks as poor asset quality, as indicated by a high level of NPLs, can erode the bank's profitability, and by extension, its ROE.The study recommends that the regulators and supervisory authorities need to closely monitor and address NPLs in the banking sector. High NPLs can not only affect individual bank stability but also have systemic implications for the overall health of the financial system. Regulatory frameworks that encourage prudent lending practices and the maintenance of healthy asset quality are crucial..

KEYWORDS:

Risk Assets, Asset Quality, Non-Performing Loan, Financial Performance, Return on Equity.

Introduction

The banking sector globally serves as a linchpin of modern trade and economic development, acting as a major source of finance for economies (Pradip & Shrestha, 2017; Lone & Ahmad, 2017; Kaidiogla, Telcekem&Ocal, 2017; Odundo&Orwarn, 2018; Muraina, 2018; Besmir & Muhamet, 2021). Deposit money banks, a significant part of this sector, have a profound impact on the economic landscape of Nigeria. Their financial performance, especially return on equity, is crucial for assessing their contributions to the national economy (Ngo & Phung, 2020; James, 2021; Nwaiwu, 2021; Nwaiwu& Joseph, 2022).

Over the past decade, the performance of deposit money banks has been a focal point for management experts, investors, and economic analysts worldwide (Omodero& Ogbonnaya, 2018; Olaoye & Alade, 2019). This is closely related to the significant influence of these banks' profitability on the potential growth of the country's economy. As a result, the banking landscape has undergone substantial changes to enhance financial performance (Paul & Mwamba, 2018; Zribi &BonjeIbene, 2021).

Deposit money banks are instrumental in the allocation of economic resources within countries, channeling funds from depositors to investors continuously (Onyore& Kusa, 2013). They provide essential services like deposit and credit facilities, offer access to the nation's payments systems, and play a role in transmitting monetary policy, contributing to economic stability (Adeghite, Kumi, & Kumi, 2018; Nwaiwu, 2022). The soundness of a country's banking sector is vital for the overall health of its economy (Sufian &Chorgi, 2019; Oguntodu, Osho & Ogbebor, 2020), and this connection between the banking sector and the nation's economy is well-established (Katrodia, 2020).

The financial performance of deposit money banks serves as a barometer, indicating the strengths and weaknesses of these institutions (Makkar & Singh, 2013). Profitability is a fundamental measure of their performance (Nwaiwu, 2019; Nwaiwu& Amah, 2020; Nwaiwu& Joseph, 2021). The sustainability of deposit money banks is heavily contingent on their profitability. This is because they need to generate income not only to cover operational costs but also to provide dividends to shareholders, encouraging further investment (Hussain, Jad, Alhyari& Nora, 2020). If banks cannot meet this goal, they face the possibility of closure to avoid losses (Abebe & Abera, 2019; Al-abedallat, 2019; Al-Smadi, 2020). Profit is the ultimate objective for deposit money banks, driving their strategies and activities (Ongore& Kusa, 2013).

In line with this, profitability is defined as an organization's ability to maintain consistent profits year after year (Ayanda, 2008). Profitability extends beyond the organization, contributing to economic development by reinvesting profits, creating employment opportunities, and increasing tax revenue (Bekhat, Alsmadi&Khudari, 2020; Nwaiwu, 2022). The quality of life for citizens also improves as shareholders benefit from higher dividends (Singh, Misra, & Tiwari, 2019; Nwaiwu& Amah, 2020). Thus, the financial performance of deposit money banks has a profound impact on a country's growth and the well-being of its citizens (Zainadin, Mahdzan& Leong, 2018).

Furthermore, the quality of assets, specifically the assessment of credit risk, plays a vital role in evaluating asset quality. Asset quality significantly affects a bank's financial stability and operational health (Yin, 2009; James, 2021; Kafidipe, Uwolonwa& Okene, 2021). The primary determinant of asset quality is the value of the loan portfolio and credit management control (Nwaiwu and Joseph, 2021). Loans and securities are critical components of a bank's assets and carry substantial risks (Dang, 2011; Hitchner, 2022). Asset quality, therefore, has a direct bearing on a bank's financial performance.

The non-performing loan ratio is a common proxy for asset quality, and a higher ratio indicates lower asset quality. A negative trade-off is observed between asset quality and a bank's financial performance (Ombaba, 2013; Kafidipe, Uwalonwa, Okene, Dahansi&Ojone, 2021). The evaluation of assets to measure credit risk is integral to this assessment (Nwaiwu& Amah, 2020). Banks are expected to maintain an adequate allowance for loan and lease losses (ALL) to safeguard against bad debts and loan defaults (Abata, 2014). A bank's assets are largely determined by its loan portfolio quality, and loans are the primary income generators (Dang, 2011).

However, the Nigerian banking sector faces significant challenges. The financial intermediation level is low, reflecting a lack of confidence in the sector. Non-performing loans have been a pervasive issue (Admassu &Asayehgn, 2014; Nwaiwu, 2019). The global financial crisis also impacted Nigerian banks, leading to stagnation, declining profitability, and an increase in non-performing assets and loans (Nada, 2012, cited in Muhabie, 2015). Given these challenges, and the potential impact of asset quality on financial performance, a more systematic examination of the relationship is necessary.

In summary, the link between risk asset quality and financial performance in Nigeria's deposit money banks warrants in-depth exploration due to its critical implications for the economy and the well-being of its citizens. Empirical research in this specific context is needed to address the existing gaps in the literature and provide insights relevant to Nigeria's unique banking landscape.The geographical area of the study is Nigeria. However, the study covered the eight(8) quoted deposit money banks which are listed on Nigerian Stock Exchange as shown in the fact book.This study is carried at the institutional level and it concerned the study data which were extracted by content analysis from corporate annual report of quoted deposit money banks in Nigeria from 2010-2020.

Literature Review

Theoretical Framework

The theoretical framework is generally seen as bedrock on which knowledge is constructed for research work. It provides a platform for understanding and guiding the discussions that underlie the study. In this study, the following theories formed a platform on which the empirical study is placed.

Liquidity-Profitability Trade-Off Theory:

The Liquidity-Profitability Trade-Off theory is another theory upon which this study is hosted. The theory posits that a trade-off exists between the liquidity and the profitability of a firm, and that a firm cannot pursue the two objectives of being profitable and being liquid at the same time without automatically affecting the other. The theory presupposes that the regulation of banks is necessary to maintain safety and soundness of the banking system, to the extent, which put banks in a position to meet their liabilities without difficulty. One outcome of the recent financial crises is the recognition that liquidity is as important to the bank stability, as are capital requirements. Previous studies showed that banks with higher liquidity and larger capital buffers are less vulnerable to failure during financial crisis Bagyenda et al. (2017) and this made it imperative for the regulatory authorities to compel greater solvency and liquidity on individual banks than making it optional. This theory is adopted because it captures the financial performance of banks and the LCR variable, which measures the short -term liquidity positions of banks in the model adopted by this study.

Conceptual Framework

Financial Performance

Financial performance in an organization demonstrates the proficient use of resources and the organization capacity to generate profit. It is of considerable interest to stakeholders, including

customers, payables, shareholders, government and mangers in that it shows shareholders the return on capital invested, return on assets, return on equity, earnings per share and profit after tax, send signals to customers of the organization capacity to meet their needs, shows government the capacity of the organization to pay its tax; and shows mangers the value of their effort and human capital invested in theorganization (Aymen, 2013; Nwaiwu, 2018).

Return on Equity

Return on equity shows the profitability to shareholders of the firm after all expenses and taxes (Van,Horne&Wachowicz, 2018). It measures the amount the firm is earning after tax for each naira invested in the firm. In other words, ROE is net earnings per Naira equity capital. It is also an indicator of measuring managerial competence (Rose, 2017). Higher ROE means better managerial performance; however, a higher return on equity may be due to debt (financial leverage) or higher return on assets. Financial leverage creates an important distinction between ROA and ROE in that financial leverage always expands ROE. This will always be the case as long as the ROA (gross) is greater than interest rate on debt (Jaffe, Jeffrey &Westerfiled, 2014). Usually, there is higher ROE for high growth companies.

Reimann (2019) published his work that ROE was used extensively for measuring whether value was being created for shareholders. The reason behind the adoption of ROE as a measure was that it gave more reliable results than earnings per share (EPS) (Reimann, 2019). As it is important to consider how investors value the shares of a company, (Reimann, 2019) considered a number of strategy consulting firms and found that they focus their measurements on the spread between ROE and the cost of equity. If the spread is positive, it indicates that a company has advantageous growth opportunities. Reimann (2019) also identified changes to accounting conventions (policies) as being a problem when using ROE as a performance measure. It was also recognized that financial measures such as ROE may be too short-term and that longer-term measures, perhaps more qualitative, must be adopted as well. Reimann (2019) found that ROE still left 66 percent of the variation in share prices unexplained, indicating a large degree of unreliability.

Risk-Asset Quality

Risk-asset quality, also known as asset quality, refers to the condition or quality of a financial institution's assets, particularly its loans and investments, in terms of the level of risk associated with those assets. It is a critical aspect of a financial institution's health and stability. The assessment of asset quality focuses on determining the likelihood that these assets will generate losses due to defaults, non-payment, or other factors.The quality of assets is significant aspect to assess the degree offinancial strength of a bank. The principal purpose of measuring the assets quality is to determine the composition of non-performing assets (NPAs) as a percentage of the total assets (Aspal& Dhawan, 2016; Nwaiwu& Amah, 2020). Thus, lowest non-performing loan shows that the good health of the portfolio of asset at banks. The lower the ratio the better the bank performing (Sangmi& Nazir, 2020). It is a method of measuring the banks financial performance using non-performing assets/Net advances (the higher the better)(Srinivasan &Saninatuin, 2016). Muralidhara and Lingann(2017) also measured asset quality in terms of institution’s total non-performing asset and their ratio tototal net asset; net NPA to net advances, net NPA to net asset and owners total investmentto total assets. In addition, Mulualem (2018) clearly showed, asset quality has positive correlation with return on equity and return on asset. Tadios(2016) stated that the prime objective of measuring the asets quality is to ascertain the component ofnon-performing assets (NPAs) as percentage of the total assets. Nwaiwu (2021) measured it by total loans and advanced to total assets ratio (loans and advance/total assets) and total investments to total assets ratio (total investment/total asset).

Non-Performing Loans

Strikingly, non-performing loans reflect the health of the financial system affecting the profitability. A non-performing loan is any obligation or loan in which interest and the principal payments are more than 90 days overdue, more than 90 days' worth of interest has been refined, capitalized or delayed by agreement or if payments are less than 90 days overdue but payments are no longer anticipated (International Monetary Fund, 2009), poor credit risk management and plain back link, in form of external independent factors are the main reason for non-performing loan (James, 2021). The inflationary deregulation and special market conditions can lead to poor credit lending decision which in turn leads to non-performing loans in fact, many non-performing loan studies are conducted in the countrieswith financial market reason (Nwaiwu, 2021). Ongoing financialcrises suggest that non-performing loans amount is indicator of increasing threat of insolvency and failure. However, the financial markets with high non-performing loan have to diversify their risk and create portfolios with non-performing loan along with performing loans(Evnst& Young, 2016).

Efficient credit risk management supports the fact that lower non-performing loan ratio is associated with lower risk and lower deposit rate. It also implies that in the long run, relatively high deposit rate increases the deposit base in order to fund relatively high risk loans and consequently increases possibility of non-performing loan ratio. Therefore, the allocation of the available fund and its risk management heavily depend on how the credit risk is handled and diversified to decrease the non-performing loan amount. Non-performing loan is a probable loss that requires to be provided for in the profit or loss account of the banks. These non-performing loans provision reduces bank profitability. Therefore, high non-performing loan amount increases the provision amount which in turn reduces the profit.

Empirical studies on the factors that cause – non performing loans of quoted deposit money banks suggest that factors on controllable by central banks to be the major contributor to non-performing loans. Specifically, the diversification of fund and weak credit analysis. This is inconsistent with what was established in Nigeria (Nwaiwu, 2022). Who found unfavourable economic environment specifically the national economic downturn leading to the depression of businessto be perceived as the most important factor that caused non-performing loans. The results however, are consistent with moral hazards concept explained to the lender and let them keep any profits above this fixed amount. This situation provides an incentive to borrowers to take on investment projectsthat are riskier than the lender would like due to high risk high return principal(Sufian & Chong, 2019).

The situation becomes worse if the borrower is not honest and decides to hide the actual performance of the investment in order to avoid paying his/her obligations to the lender. This was also evidenced in this empirical study where results show that some borrowers lack integrity and are not transparent. Weak credit analysis might have also been caused by unfaithful staff.

Beck., Jakabik and PIloi (2013) in a study on non-performing loans (NPLs) in 75 countries argue that " over the past decades, the credit quality of loanportfolios across most countries in the world remained relatively stable until the financial crises hit the global economy in 2007-2008. Since then, averagebank asset quality deteriorated sharply due to the global economic recession. Yet the deterioration of loan performance was very uneven across countries. Beck., Jakubik and Piloi(2013) were interested in explainingthese differences in bank asset quality across countries and overtime. In their findings they found no the direct impact of share prices on NPL and posited that the impact was less obvious. They further argued that the extents that share prices are correlated with house prices.

They supposed that their findings could reflect the notion that a drop in the value of collateral for housing loans could negatively affect the loan quality of consumer loans.

Nwaiwu(2019), in his empirical study on "level of non-performing loans and financial performance of quoted deposit money banks in Nigeria" found an inverse relationship between the level on non-performing loans and bank performance as measured by return on assets. Muasya (2000) studied the impact of non-performing loans on the backing sector performance in Kenya and that non-performing loans negatively affected banking sector profitability as measured by forecasted GPD growth factor. Shrestha (www.academia.edu) found a negative relationship between the amount of non-performing loans and stock price using data from Nepali Commercial banks in India.

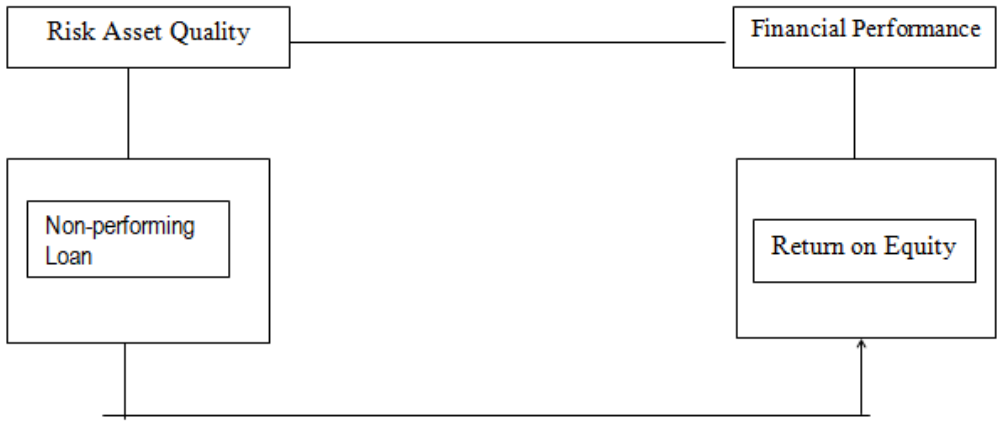

Figure 2.1: Operational Framework of Assets Quality and Financial Performance of quoted Deposit Money Banks in Nigeria.

Figure 2.1: Operational Framework of Assets Quality and Financial Performance of quoted Deposit Money Banks in Nigeria.
Sources: Non-performing loan (Kiran & Jones, 2016), Liquidity Management (Bace, 2016), Management Efficiency (Etale., Ayunku&Etale, 2016), Return on Equity (Ugoani, 2016).

Empirical Review

Abba., Zachariah and Inyang (2022) empirically examined the relationship between capital adequacy and banking risk. A sample of twelve banks out of twenty banks in the Nigeria banking industry were studied from 2017-2021 periods. The study employs multiple regression, serial correlation and multicollinearity based on Durbin Watson result to analyse data. It also adopts value to risk to estimate capital adequacy ratio of banks. This means when risk level rises, capital adequacy ratio falls in the Nigeria banking industry. The study recommends thatNigeria should adopt a risk based approach in the management of capital instead of using paid-up capital and retained earnings as currently practiced, hence there is a significant relationship between capital adequacy ratio and banks risks. It also recommends that banks should adopt pragmatic approach as increase indeposits does not necessary result in increase in capital adequacy ratio so as to guarantee the safety and security of depository.

Naceur and Kandi (2022), study the impact of asset quality on bank performance: The case of Egypt. The study investigates the impact of asset quality on cost of intermediation and profitability of Egyptian banking industry. Using a sample of 28 banksconsolidated from financial statements and micro finance data from world bank indicators (WBI) between 2016-2020 period, the empirical study employed two alternative measures ofasset quality and profitability variables. The profitability

variables uses returnon asset (ROA) and return on equity (ROE), while asset quality variables were loan and advanceand capital adequacy. The empirical analyze cross-sectional and time series data usingcross-section and panel data estimators and then present the generalizedmethod of moments (GMM)estimator. Finding indicates that capital adequacy variable (capital/assets), loan and advance has a positive and significant impact on return on assets and return on equity. The overall empirical results support the central bank efforts to enforce asset quality towards improving the performance of the bankingsector in Egypt. The empirical study recommend that higher capital requirements, reduction inimplicit cost and increase in size of banks leadsto banks profitability in the post-regulation period.

Asikhia and Sokefun (2022), study capital adequacy and banks profitability: Empirical evidence from Nigeria. The study investigates the impact of capital adequacy on banks profitability of domestic and foreign banks in Nigeria. It combines the use of 518 questionnaire administered to bank staff with a response rate of 76% basically to obtain primary data and published financial reports of studiedbanks between the 2016-2020 periods. The study use survey design in line cross-sectional researchdesign. It also uses linear regression to analyze the primary data and panel data to analyze the secondary data analyzed revealed a positive and significant relationship between capital adequacy and profitability of banks. This simply means that capital adequacy is important in the determination of banks profitability in the Nigerian commercial banks. Findings, also revealed that capitalization and profitability are indictors of bank risk management efficiency and cushion against losses not covered by current earnings. Thestudy recommends that the regulatory authorities should ensure the sustainability of the gains of banking sectors reforms. They recommend further that mere risk management framework should be drawn as this will have positive effect on banks profitability in the Nigerian banking industry.

Regnar., Kethi and Maureen (2022). The role of capital requirements on bank competition and stability: The case of Kenyan banking industry. The study investigates the role of capital requirements on banks competition and stability in Kenyan for 2020-2021 periods. The study estimates the fixed effects panel regression model for the 36 commercial banks operating in the Kenyan banking industry suingLerner Index and Panzar and Rosse H-statistics as a measure of competition. The study use return on equity to capture bank performance and stability and the estimation results shows a positive relationship supporting the evidence that capital regulation improves theoverall financial stability and performance of banks. Findings from the study also indicate that thepanel estimates shows significant non-linear effect of core capital on competition. The log of core capital is positive and significant while squared log of core capital is negative and significant. This however means that an increase in core capital reduces completion up to a point and then increases competition indicating that the benefits of increasing capital requirements on competitiveness will yield benefits once banking sector consolidation start.

Mnyampanda and Chindengwike (2021), examined the relationship between asset quality and financial performance of commercial banks before and after shifting capital city located to Dodoma Region, Tanzania. Through a quantitative research approach coupled with panel data were generated through document reviews. The research location were carried out at National Micro-finance bank Plc (NMB), co-operative rural development bank (CRDB) and Tanzania postal bank (TPB) located in Dodoma Region. The population of this study comprised quarterly financial data from 2010-2020. A sample size of 120 observations calculated by taking the(quarterly) financial data of 10 years from three commercial banks so, three (3) commercial banks were employed purposive sampling procedure. The data were extracted from reliable source such as bank of Tanzania (BOT) and Dares

Salaam Stock Exchange (DSE). The findings show that there is a relationship between asset quality and finical performance before and after shifting the capital city from Dares Salaam to Dodoma Region (P-value of 0.006), (0.03) and (0.005), CRDB, NMB and TPB respectively. It is, therefore, concluded that there is a statistically significant association between the shift of the capital city from Dares Salaam to Dodoma Region and financial performance of commercial banks in Tanzania before shifting capital city and after shifting the capital city. The study recommends that the bank of Tanzania, international financial organizations and policy makers to supervise the operations of commercial banks to increase asset quality. This may be done by monitoring and mentoring to show good directions to the commercial banks.

Onang'o (2021), ascertained effect of credit risk management on financial performance of commercial banks listed at the Nairobi securities exchange, Kenya. This study sought to find the effect of credit risk management on performance of commercial banks listed at the Nairobi securities exchange in Kenya. The specific objectives were to find the effects of capital adequacy ratio, loss given default ratio, loan loss provision ratio and non-performing loans ratio in performance of the banks. The independent variables of the study were capital adequacy ratio, loss given default ratio, loan loss provision ratio and non-performing loans ratio while dependent variable was the abnormal stock return. Relevant theoretical and empirical literature were reviewed and gap identified to inform the empirical study. The population of the study is the forty-four licensed commercial banks in Kenya as at December 2014, as per the latest data available by thetime the study was conducted. A purposive sample of ten banks were selected based on the criteria that they were listed and had complete data for the period under study secondary data for the construction of the variables under study were collected from the financial statements and the Nairobi Security Exchange were collected the sample period. Data were diagnosed for and treated, where necessary, of the problems of panel regression. Using a longitudinal study design and a random effect model specification a panel estimate generalized least squares regression was done on the data using E-view software. Adopting a 5% non-directional test of hypothesis, the study found a statistically no significant relationship between capital adequacy ratio and bank stock performance in Kenya a statistically no significant relationshipbetween loan loss provision ratio and bank stock performance in Kenya and a statistically significant negative relationship between non-performing loan ratio had a negative and statistically effect on bank stock performance in Kenya for the period understudy. The study recommended that given the current supervisory and regulatory policy frameworks for banks, credit risk mangers should be less concerned with adjustments in the ratios of capital adequacy ratio, loss given defaultratio and loan loss provision ratio as the values of these ratios have no significant effects on performance but should instead be more prudent on the management of the non-performing loans ratio as it has a significant effect on performance, that the current regulatory policy requirements on capital adequacy ratio, loss given default ratios and loan loss provisions ratios should be maintained and that future studies in this area be carried outfor longer study periods and more independent variables, in order to bring out the true picture of the effect of the independent variables son the dependent variables of the study.

Table 1: Webometric Analysis of Asset Quality and Financial Performance of Quoted Deposit Money Banks in Nigeria.

Author's' & Year	Research Title	Country	Journal, volume, number and pages.	Part way
James, (2021)	Relationship between assets quality and financial performance of commercial banks before and after shifting capital city located to Dodoma, Region.	Tanzania	International Journal of Multidisciplinary Research and Explorer(IJMRE), 1(9),149-157	Negative
Kafidip, Uwalomwa, Okeme, Datounsi, &Ojone, (2021)	Corporate governance, risk management and financial performance of listed deposit banks in Nigeria.	Nigeria	Coregent Journal of Accounting & Finance, 3(8),45-80	Positive
Ombaba, (2021)	Assessing the factors contributing to non-performance loans in Kenya Banks.	Kenya	European Journal of Business and Management, 5(32),20-33	Positive
Zhangi, (2021)	Documentary letter of credit fraud risk management.	United Kingdom	Journal of Financial Crime, 19(4),343-354	Positive
Thiajarajan, Ayyappan, &Ramaachandran, (2021)	Credit risk determinants of public and private sector banks in India.	India	European Journal of Economics, Finance and Administrative Sciences, 3(4),45-57	Negative
Musyoki, &Kadubo, (2021)	The impact of credit risk management on the financial performance in Kenya.	Kenya	International Journal of Business and Public Management, 14(9),302-317	Negative
Jackson, (2021)	The impact of credit risk management on financial performance of commercial banks in Kenya.	Kenya	African Journal of Management Policy, 3(7),179-217	Negative
Ezeohua, (2021)	Banking consolidation credit crisis and assets quality in a fragile banking system. Some evidence from Nigeria data.	Nigeria	Journal of financial Regulation and Compliance, 19(1), 33-44	Negative
Kafidipe, Uwalomua., Okeme, Dahunsi, &Ojone, (2021)	Corporate governance, risk management and financial performance of listed deposit money bank in Nigeria.	Nigeria	Journal of Accounting, 6(2),70-80	Positive
Almajali, Alamro, & Al-Soub, (2020)	Factors affecting the financial performance of Jordankian insurance companies listed at Ammon	Ammon	Journal of Management Research, 4(2), 260-266.	Negative

	Stock Exchange.			
Kolapo, Ayeni, &Oke, (2020)	Credit risk and commercial banks' performance in Nigeria: A panel	Nigeria	Australian Journal of Business Management Research, 2(2),31-42	Negative

Because vast majority of studies failed to look at risk-asset quality and bank financial performance in developing economies, most studies use banks as case study (Partovi & Matousek, 2019). This type of research design focuses on specific firm documenting particular characteristics of these firm.Taken these together, the current study departs from the previous studies. The study concentrates on bank specific variables and financial performance. Remarkably, the study focused on Nigeria, one of the developing economies in sub-Saharan Africa. The study uses different banks rather than a single bank to understand how asset quality emanating from bank specific factors affect deposit money banks financial performance. More importantly, the theoretical implications will consolidate the different perspectives on managerial style. With respect to practical managerial implications, the study will redirect the minds of mangers especially those in the banking sector to know how loans are disburse to customers and the strategies to collect the monies. Knowing this, banks will be able to increase profitability and perform better.

Methodology

The cross-section design is employed in the study.The study adopted a positivist research philosophy. The population of research applies to the collection of all possible individuals (Abraham & Anifowose, 2020), objects (Ongeri., Nyangau &Nyaboya, 2021), measurement of interest (Amida & James, 2021). For the purpose of this empirical research, the study population comprises of eight quoted international deposit money banks in Nigeria as at 31/12/2020. Therefore, a census was adopted. The justification for this population is because of the fact that the information is readily accessible since it's a regulatory requirement for yearly publication of financial statements by all quoted deposit money banks in Nigeria.A sample size of eight(8) quoted deposit money banks were purposively selected to include on those operating on international authorization. In line with the faculty decision on the sample, the behaviour of quoted deposit money when studies against a time series or period of 12 years would result in ninety six(96) study observations to explain individually and collectively.

The data for this empirical study were entirely secondary in nature because its design suggested content analysis of data on historical economic events and business transactions which were reported as asset quality to justify compliance with financial performance. Such were obtained from the annual corporate reports of the quoted deposit money banksin Nigeria for 2009-2020. Complementary data were capture from the periodic reports on the floor of the Nigerian Stock Exchange on the concerned corporate entities' websites.

Model Specification

Based on the theoretical underpinning and empirical review of related literature made in the study (Olobo., Karyeija., Saude &Khoch, 2021). Specifically, the model specification from related empirical evidence used by Abraham and Anifowose (2020) is adopted but we made modification. The empirical study generated three models to achieve the objectives and also answer the corresponding research questions. Consequently, the model specification is formulated in the following functional form as thus:

ROE_{it} = $f(NPL_i)$ (i)

Transforming the functional form into mathematical model as thus:

ROE_{it} = $\alpha_o + \alpha_1 NPL_{it}$ (ii)

Expanding the mathematical form that does not have stochastic variable into econometric model as thus:

ROA_{it} = $\alpha_o + \alpha_1 NPL_{it} + v_{it}$ (iii)

Where the operational definitions are:

ROE_{it} = Return on asset for the period of time

α_o, = Constant for the period of time

α_1 = Regression slope γ_o

V_{it} = Stochastic terms γ_o

$_{it}$ = for the period of time

Apriori Expectations:

In this empirical study, return on equity is employed as proxy to measure the criterion variable which is financial performance. Each of the above employed measures of financial performance portrays the increase in financial value of the corporate entities under the non-performing loan, liquidity management, and capital adequacy of quoted deposit money banks in Nigeria.

In summary, the apriori expectation is stated as follows:

$\beta_{1<}o$.

Data Analysis Techniques

The data analysis is performed with the aid of descriptive statistic techniques and ordinary least square regression analysis to explore the relationship between the variables as expressed by the hypotheses. Other diagnostic tests were conducted to establish validity. Such include:

Diagnostic Test

Test for Multicollinearity

Multicollinearity is the extent to which independent variables are correlated with each other. Multicollinearity is checked using both Correlation matrix, when computing a matrix of Pearson's bivariate correlations among all independent variables, the magnitude of the correlation coefficients should be less than .80.

If multicollinearity is found in the data, one possible solution is to eliminate the variable with higher inter-correlation coefficient from the model.

Test for Homoscedasticity

The last assumption of multiple linear regression is homoscedasticity. One of the post estimation test used in this study was the Breusch-Pagan-Godfrey test for heteroscedasticity. Breusch-Pagan-Godfrey test is a linear regression model employed to ascertain whether the variance of errors from the regression was dependent on the values of the independent variables. The null hypothesis is homoscedasticity (or constant variance).

Fixed Effect Model

Fixed Effect (FE) deals with the relationship between predictor and outcome variables within an entity (country, person, company, etc.). Each firm has its own individual peculiarity that may or may not influence the predictor variables (for example, gender could influence a staff's performance of a task; or the business practices of a company may influence its stock price).

When using FE we assume that something within the individual firm may obscure the impact of the predictor or bias the predictor's influence or outcome variables and we need to control for this. This is the rationale behind the assumption of the correlation between entity's error term and predictor variables. FE remove the effect of those time-invariant firm peculiarity so we can assess the net effect of the predictors on the outcome variable.

Another important assumption of the FE model is that those time-invariant peculiarities are unique to the individual firm and should not be correlated with other firms' characteristics. Each entity is different therefore the entity's error term and the constant (which captures individual characteristics) should not be correlated with the others. If the error terms are correlated, then FE is not suitable since inferences may not be correct, then we need to model that relationship (probably using random-effects), this is the main rationale for the Hausman test (presented later on in this section).

The equation for the fixed effects model becomes:

$Yit = \beta_1 X_{it} + \alpha_i + u_{it}$

Where:

–α_i(i=1….n) is the unknown intercept for each firm (n firm-specific intercepts).

– Y_{it} is the dependent variable (DV) where i = firm and t = time

–X_{it} represents one independent variable (IV),

–β_1 is the coefficient for that IV,

–u_{it} is the error term

The key point is that if the unobserved variable does not change over time, then any changes in the dependent variable must be due to influences other than these fixed characteristics (Stock & Watson, 2003).

The FEs model controls for all time-invariant differences between the individuals, so the estimated coefficients of the fixed-effects models cannot be biased because of omitted time-invariant characteristics (like culture, religion, gender, race, etc.). One side effect of the features of fixed-effects models is that they cannot be used to investigate time-invariant causes of the dependent variables. Technically, time-invariant characteristics of an individual firm are perfectly collinear with the firm dummies. Substantively, FE models are designed to study the causes of changes within a firm. A time-invariant characteristic cannot cause such a change, because it is constant for each firm.

Random Effect Model

The rationale behind random effects (RE) model is that, unlike the fixed effects model, the variation across firms is assumed to be random and uncorrelated with the predictor or independent variables included in the model:

The crucial distinction between fixed and random effects is whether the unobserved individual effect embodies elements that are correlated with the regressors in the model, not whether these effects are stochastic or not (Green, 2008). If we have reason to believe that differences across firms have some influence on the dependent variable then we used random effects. An advantage of random effects is that we can include time invariant variables (e.g., gender). In the fixed effects model these variables are absorbed by the intercept. The random effects model is:

$Y_{it} = \beta X_{it} + \alpha + u_{it} + \varepsilon_{it}$

Where:

u_{it} = Between-firm error

ε_{it}= Within-firm error

Random effects assume that the firm's error term is not correlated with the predictors which allows for time-invariant variables to play a role as explanatory variables. In random-effects we need to

specify those individual characteristics that may or may not influence the predictor variables. The problem with this is that some variables may not be available therefore leading to omitted variable bias in the model. RE allows us to generalize the inferences beyond the sample used in the model.

Hausman Model Specification Test

To decide between fixed or random effects we ran a Hausman test where the null hypothesis is that the preferred model is random effects versus the alternative the fixed effects (Green, 2008). It basically tests whether the unique errors (u_i) are correlated with the independent variables, the null hypothesis is they are not.The econometric software that was used for the analysis in this study is the E-views 12.0.

Results and Discussion

Panel Stationarity Test

In view of the non-normal distribution exhibited by the study variables in Table 4.2, the study therefore undertakes the stationarity test to determine the viability and internal consistencies of the employed variables/data in providing a reliable result (i.e. a non-spurious result). Various statistics and formulars are employed in testing the Panel trend of test. The major ones are from; Levin, Lin & Chu t*, Im, Pesaran and Shin W-stat, ADF - Fisher Chi-square, and PP - Fisher Chi-square. These statistics must possess a probability values less than 0.05 (%). If a variables fails stationarity at level, it would be re-eveluated at the first difference. In light of this, the study presents the summary of stationarity as follows;

Panel Stationarity Test Summary of Employed Variables at Level (0)

All employed variables are test at level (i.e. their natural values as follows).

Table 1: Panel Stationarity Test Summary of Employed Variables at Level (0)

Variable		*Levin, Lin & Chu t**	*Im, Pesaran and Shin W-stat*	*ADF - Fisher Chi-square*	*PP - Fisher Chi-square*	*Decision*
ROE	Stat Prob	-1.25370 (0.0753)	-3.40864 (0.0633)	2.09739 (0.0770)	2.54505 (0.0971)	Presence of Unit Root at Level (0)/ No Stationarity
NPL	Stat Prob	-2.36979 (0.0901)	1.65905 (0.9514)	118.329 (0.7185)	15.5582 (0.0990)	Presence of Unit Root at Level (0)/ No Stationarity

Table 1 which shows the stationarity test at level (0) using the Levin, Lin & Chu t, Im, Pesaran and Shin W-stat, ADF - Fisher Chi-square, and PP - Fisher Chi-square shows that all employed variables are observed to possess unit roots and are therefore do not show stationarity at level. This simply means that, our employed variables at their natural values and form do not possess smooth trend that can lead to a reliable estimation. This also means that, the use of these variables at their natural form will lead to an unreliable estimation and result. In light of this, the study therefore needs to proceed to the evaluation of the stationarity of the underlying variables at level. This is therefore presented in the next table (2).

Panel Stationarity Test Summary of Employed Variables at First Difference (1)

This form of stationarity test simply differences the variables so as to smoothen them and determine their internal consistencies. This is therefore presented in the following table.

Table 2: Panel Stationarity Test Summary of Employed Variables at First Difference (1)

Variable		*Levin, Lin & Chu t**	*Im, Pesaran and Shin W-stat*	*ADF - Fisher Chi-square*	*PP - Fisher Chi-square*	*Decision*
D(ROE)	Stat Prob	-18.9447 (0.0000)	-8.79443 (0.0000)	334.009 (0.0000)	588.584 (0.0000)	Stationary at First Difference (1)
D(NPL)	Stat Prob	-17.5149 (0.0000)	-4.02851 (0.0000)	220.560 (0.0000)	375.874 (0.0000)	Stationary at First Difference (1)

As a result of non-stationarity at level, the study were differenced and tested in the above table (2). The study therefore observes from the above table that all variables attained stationarity immediately they were differenced as a result of their probability values all being below the threshold level of 0.05 (5%), which shows the absence of unit root. This shows that, all variables performed better in terms of internal consistencies and trend when they were differenced. This similarly means that, the employed variables can be used for subsequent test and will produce results that are reliable. In light of the observation of stationarity at first difference, the study proceeds to the Panel trend of Cointegration test.

Data Analysis

In order to carry out the undertaking of the Panel trend of Cointegration, the study needs to determine the best model that would give the biggest explanation of the dependent variables. There are therefore three models i.e. pooled, fixed and random effect which needs to be evaluated to know which is more reliable and has the most predictive ability. To do this, we will employ designated diagnosis tools to test the optimal model between the fixed effect, random effect and pooled effects using the Likelihood Ratio Test, Hausman Specification Test, and the Lagrange Multiplier Tests output. All this will be presented as follows for both model;

Pooled Effect

To evaluate the nature of short run relationship between employed variables using a single constant parameter across the various cross-section, the pooled effect is presented as follows;

Return on equity Equation (ROE)

Table 3: Pooled Effects Regression Output for model 1–Return on equity Equation (ROE)

Dependent Variable: D(ROE)
Method: Panel Least Squares
Periods included: 11
Cross-sections included: 8
Total panel (unbalanced) observations: 88

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.394703	0.477145	17.59360	0.0000
D(NPL)	1.21E-10	1.75E-09	0.069109	0.9449
R-squared	0.282396	Mean dependent var		8.620786
Adjusted R-squared	0.243800	S.D. dependent var		10.59321
F-statistic	0.386757	Durbin-Watson stat		0.940160

Prob(F-statistic)	0.818183

Table 3 above shows the pooled effect of the first model (Return on equity). The R-Square value of 0.282396 shows that, in this effect, the employed predictor variables non-performing loan (NPL) account for only 24.38% of variations in the dependent variable i.e. financial performance as measured using the Return on equity of the sampled 8 deposit money banks. The Durbin-Watson Statistics value of 0.940160 is seen to be very low and shows positive serial correlation which is bad and shows overlap between the trends of the employed predictor variables. The F-statistics value of 0.386757 at a probability value of 0.818183 which is greater than the 0.05 significance level shows a weak model. From the coefficients and significance level, the study observes that non-performing loan (NPL) shows a positive (1.21E-10) but insignificant (0.9449> 0.05) influence on the Return on equity of sampled deposit money banks, which means that, a unit increase in non-performing loan (NPL) is likely to have a 1.21E-10 unit increase in ROE. The study cannot accept the result of this effect until we employ our diagnosis test to know if it is the optimal model. This therefore makes us proceed to the next effect (Fixed Effect).

Fixed Effect

Effects are fixed if they are interesting in themselves or random if there is interest in the underlying population. Therefore, the fixed effect seeks to evaluate the model considering each case (deposit money banks effect). This is therefore presented as follows;

Table 4. Fixed Effects Regression Output – Return on equity (ROE).

Dependent Variable: D(ROE)
Method: Panel Least Squares
Periods included: 11
Cross-sections included: 8
Total panel (unbalanced) observations: 88

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.924018	0.458544	19.46165	0.0000
D(NPL)	-2.63E-10	1.38E-09	-0.190617	0.8489
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.888586	Mean dependent var		8.620786
Adjusted R-squared	0.827641	S.D. dependent var		10.59321
S.E. of regression	8.014234	Akaike info criterion		7.101902
Sum squared resid	37187.98	Schwarz criterion		7.584614
Log likelihood	-2234.567	Hannan-Quinn criter.		7.289147
F-statistic	8.016753	Durbin-Watson stat		1.833128
Prob(F-statistic)	0.000000			

Table 4 above shows the fixed effect of the first model (ROE). The R-Square value of 0.888586 shows that, in this effect, non-performing loan (NPL)) account for only 88.86% of variations in the dependent variable i.e. financial performance as measured using the Return on equity of the sampled 8

deposit money banks. The Durbin-Watson Statistics value of 1.833128 is seen to be within the relevant range and therefore shows the presence of negative serial correlation which is acceptable. The F-statistics value of 8.016753 at a probability value of 0.000000 which is less than the 0.05 significance level and therefore shows a viable model. From the coefficients and significance level, the study observes that; non-performing loan (NPL) shows a negative (-2.63E-10) and insignificant (0.8489> 0.05) influence on the Return on equity of sampled deposit money banks, which means that, a unit increase in Non-performing loan (NPL) is likely to have a -2.63E-10 unit decrease in ROE. The fixed effect results cannot be accepted without the diagnosis test, which will enable the determination of the optimal effect. We therefore proceed to the next effect (Random Effect).

Random Effect

Random effects models will estimate the effects of time-invariant variables.

Table 5 Random Effects Regression Output – Return on equity (ROE).

Dependent Variable: D(ROE)
Method: Panel EGLS (Cross-section random effects)
Periods included: 11
Cross-sections included: 8
Total panel (unbalanced) observations: 88
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.637849	0.977333	8.838188	0.0000
D(NPL)	-3.19E-11	1.36E-09	-0.023483	0.9813
	Effects Specification			
			S.D.	Rho
Cross-section random			7.132352	0.4420
Idiosyncratic random			8.014234	0.5580
	Weighted Statistics			
R-squared	0.350462	Mean dependent var		2.890789
Adjusted R-squared	0.295747	S.D. dependent var		7.979955
S.E. of regression	8.006685	Sum squared resid		41284.91
F-statistic	0.074351	Durbin-Watson stat		1.651363
Prob(F-statistic)	0.989956			
	Unweighted Statistics			
R-squared	-0.003283	Mean dependent var		8.620786
Sum squared resid	72954.74	Durbin-Watson stat		0.934502

Table 5 above shows the random effect of the first model (Return on equity). The R-Square value of 0.350462 shows that, in this effect, all employed predictor variables such as non-performing loan (NPL) account for only 35.05% of variations in the dependent variable i.e. financial performance as measured using the Return on equity of the sampled 8 deposit money banks. The Durbin-Watson Statistics value of 0.934502 is seen to be very low and shows positive serial correlation. The F-statistics value of 0.074351 at a probability value of 0.989956 which is greater than the 0.05

significance level shows a weak model. From the coefficients and significance level, the study observes that non-performing loan (NPL) shows a negative (-3.19E-11) but insignificant (0.9813> 0.05) influence on the Return on equity of sampled deposit money banks, which means that, a unit increase in Non-performing loan (NPL) is likely to have a -3.19E-11 unit decrease in ROE. The study cannot accept the result of this effect until we employ our diagnosis test to know if it is the optimal model. This therefore makes us proceed to the next effect (Fixed Effect).

Diagnostic test

Likelihood Ratio Test (Compares Pooled and Fixed)

This test seek to select the best effect between the Pooled and Fixed effect. The null hypothesis supports the pooled effect.

Model 1: Return on equity (ROE)

Table 6: Likelihood ratio test output – Return on equity (ROE).

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	8.468351	(65,579)	0.0000
Cross-section Chi-square	433.647024	65	0.0000

Source: Extract from E-view version 11 Output

Table 6 which shows the Likelihood ratio test shows a Cross-section F-statistics value of 8.468351 at a probability level of 0.000 which is less than the 0.05 (5%) significance level shows the rejection of the null hypothesis. This therefore shows that the best model is the fixed effect, which represents the alternate hypothesis in this case. This therefore shows that the fixed effect in light of the pooled effect is more superior.

Hausman Specification Test

This diagnostic test pits the random effect against the fixed effect. The null hypothesis in this case is the Random Effect. Therefore, a retained null supports the random effect, while a rejected null hypothesis supports the fixed effect.

Model 1: Return on equity (ROE)

Table 7: Hausman Specification Test output – Return on equity (ROE).

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	7.317698	4	0.0061

Table 7 shows the Hausman Specification test which seeks to examine the most valuable effect

between the random and fixed effect. The Cross-section random Chi-Square statistics value of 7.317698 at a probability level of 0.0061 which is less than the 0.05 significance level leads to the rejection of the nullhypothesis. This shows that the fixed effect remains the paramount effect in the model. The study therefore moves on to determine the long run effect using the fixed effect.

Hypotheses Testing

The t-statistics and probability level are used to test the significance of employed variables in the long run individual hypotheses stated in the null and alternate form as follows.

$H0_{11}$: Non-performing loandoes not significantly affect return on equity in quoted deposit money banks.

$H0_{11}$: Non-performing loansignificantly affects return on equity in quoted deposit money banks.

Utilizing the Error correction estimate in Table 4.40, it can be seen that the t-statistics coefficient of non-performing loan (NPL) of -67.43430 is greater than ±1.98/2and at the probability level of 0.0000 which is lower than the 0.05 significance level and therefore shows that this variable is statistically significant. The study therefore rejects the null hypothesis and accepts the null hypothesis that non-performing loan does not significantly affect return on equity in quoted deposit money banks.

Non-performing loan (NPL) shows a negative (-2.07E-05) *and significant* (0.0000 < 0.05) influence on the Return on equity of sampled deposit money banks, which means that, a unit increase in non-performing loan (NPL) is likely to have a -2.07E-05 unit decrease in ROE in the long run.The reason for the adverse effect of Non-performing Loan can be attributed to the humongous expenses Nigerian deposit money banks incur in the processing of raw materials into finished goods. In an inflationary environment, rising overhead expenses can force deposit money banks to raise prices on their products, even if materials and labour remains constant. Many Nigerian deposit money banks have failed to control overhead costs associated with production and show no intrigue for the cost-reduction benefits of implementing automation and technology within their manufacturing facility. This is largely attributable to the fear that deposit money banks harbour as regards the initial cost and investment in the development of their technological capability, which reduces their future returns (returns on equity). In Nigerian deposit money banks can be observed to have failed to adequately evaluate the long-term benefits of adding various types of technology within their operations to determine whether the initial implementation cost will be worth it.This, therefore supports the studies of Santos (1993) argued that non-innovative technologies (those that maintain the status quo) are not likely to improve a firm’s market value or financial performance.The study goes against the Norton (1992) posit that not all technologies have positive impact on the organization, since in Nigerian deposit money banks as observed in the study are averse to the initial cost associated with technological development.

Conclusion

Non-performing loans (NPLs) are a reflection of the credit risk faced by banks, and a high level of NPLs suggests that a significant portion of the bank's loan portfolio is at risk of not being fully repaid. When NPLs have a negative and statistically significant impact on a bank's Return on Equity (ROE). The study reaffirms the importance of maintaining high-quality assets for deposit money banks. Poor asset quality, as indicated by a high level of NPLs, can erode the bank's profitability, and by extension, its ROE. This emphasizes the need for robust credit risk management practices within the banking industry. The negative influence of NPLs on ROE implies that as non-performing loans increase, the bank's ability to generate profit from its equity decreases. This can affect the bank's attractiveness to investors and its ability to provide returns to shareholders.

Recommendations

Based on the outcome of the research findings and conclusions, the following policy recommendations are worthy of notice.The study recommends that:

(i) Regulators and supervisory authorities need to closely monitor and address NPLs in the banking sector. High NPLs can not only affect individual bank stability but also have systemic implications for the overall health of the financial system. Regulatory frameworks that encourage prudent lending practices and the maintenance of healthy asset quality are crucial.

(ii) Deposit money banks should continually assess and improve their risk mitigation strategies, including credit underwriting, collateral valuation, and loan loss provisioning. These measures are vital in reducing the impact of NPLs on the bank's ROE.

(iii) Investors and stakeholders in deposit money banks should consider the level of NPLs as a critical factor in their investment decisions. Banks with strong asset quality and effective risk management practices are more likely to maintain stable and attractive returns for shareholders.

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