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Determining the Financial Performance of Tier-1 Deposit Money Banks in Nigeria Using Bank Liquidity

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Abstract: *This research explored the influence of liquidity on the financial performance of tier-1 deposit money banks listed on the Nigerian exchange group. The specific goal was to analyze the effect of current ratio, cash ratio, and quick ratio on the banks' Return on Assets. The study employed an ex-post facto research design and used complete enumeration sampling to select a sample of the entire five tier-1 banks. The data was obtained from the financial statements of the selected banks from 2011 to 2020. The Hausman-specification test was used to determine between a fixed effect and random effect model, and the Panel Least Square regression was performed through the Fixed Effect Model. The results showed that the current ratio has no significant impact on the return on assets of the banks (p-value = 0.5020); the cash ratio has a significant negative effect (β2 = -0.224068, p-value = 0.0106); and the quick ratio has a significant positive effect (β3 = 0.242712, p-value = 0.0082) on the ROA. The study recommended that deposit money bank management should aim to keep a lower percentage of their assets in cash form, especially when they can meet most of their customers' cash needs, in order to avoid holding idle cash that does not improve their ROA.*

Keywords*: Liquidity, Financial Performance, Current Ratio, Cash Ratio, Quick Ratio, Return on Assets*

1.0 Introduction

Deposit money banks play a critical role in the economy of a nation by simplifying payments and transactions, facilitating the smooth transfer of goods and services, and contributing to the creation of new industries (Azzam & Almaleeh, 2022). In Nigeria, deposit money banks serve as the primary lending source for both the public and private sectors, making their efficiency crucial for economic stability and growth (Thinh, Thuy & Tuan, 2022). These banks offer various services, including collecting savings in the form of deposits and directing these savings to investors in the form of loans (Mohammed & Al-Okdeh, 2022). However, this diversification of services creates risks, including the risk of liquidity, which occurs when banks do not have enough cash or borrowing capacity to meet customer withdrawals, loan demands, or other cash needs (Ojo, Ogunsanwo, Adebayo & Oke, 2022).

Liquidity refers to a bank's ability to meet its obligations to depositors and creditors and to convert its assets or securities into cash to meet customer needs (Aggreh, Nworie, Ejimadu & Ikuemonisan, 2021)). This reflects the bank's financial health and performance (Mumtaz, Abdul & Mir, 2022). An optimal level of bank liquidity is positively associated with financial returns as it enables the bank to finance asset growth and meet unexpected demands (Hacini, Boulenfad & Dahou, 2021). The relationship between liquidity and financial performance is complex, with an excessive pursuit of either variable affecting the other (Ndum, 2021). Shareholders desire maximum financial performance (Nworie & Mba, 2022) while depositors prioritize maximum liquidity and safety, but financial performance is optimized when banks strike a balance between the two (Ajayi and Lawal, 2021). Deposit money banks accept deposits, which are typically short-term in nature, and use these deposits to finance deficit units, requiring adequate liquidity to avoid shortage and optimize profit performance (Ighoroje & Akpokerere, 2021). Banks that suffer from liquidity problems risk losing business opportunities, undermining their competitive advantage and earnings (Ojo, Ogunsanwo, Adebayo & Oke, 2022). Illiquidity in banks can also erode public trust in the financial system (Ojo, Ogunsanwo, Adebayo & Oke, 2022).

Adequate liquidity is crucial for the survival and stability of banks, as the majority of their liabilities, typically in the form of deposits, are payable on demand (Mohammed & Al-Okdeh, 2022). In order to avoid bankruptcy and ensure a high return, banks need to balance their liquidity and profitability goals (Mohammed & Al-Okdeh, 2022). In order to maintain effective and efficient operations, banks must have a solid liquidity position, managed through the use of ratios such as the current ratio, cash ratio, and quick ratio (Laminfoday, 2018). If banks are unable to match the maturity of inflows and outflows of liquid assets, or if there is an unexpected demand for liquidity, it can lead to financial risk (Laminfoday, 2018). Deposit money banks in Nigeria play a significant role in the country's financial system by providing an efficient mechanism for mobilizing and channeling resources from surplus to deficit areas. This makes it important to study the effect of liquidity on their financial performance (Mohammed & Al-Okdeh, 2022).

The lack of sufficient liquidity, even in small amounts, can result in significant disruption to a bank's operations and customer relationships (Wuave, Yua & Yua, 2020). If the bank is unable to meet the daily demands for withdrawals and loan requests from customers, it can lead to a liquidity crisis that damages the bank's reputation and erodes customer confidence (Mohammed & Al-Okdeh, 2022). This shortage of liquidity also poses a problem for the earnings power of deposit money banks as it can limit their ability to profitably invest excess funds. Additionally, inadequate liquidity puts banks at risk of facing penalties from regulators for

compliance issues (Mohammed & Al-Okdeh, 2022). The reduced confidence in deposit money banks that results from this lack of liquidity also affects their performance, leading them to seek emergency funds at higher cost, reducing their earnings and return on assets (Wuave, Yua & Yua, 2020).

While there have been many studies such as Azzam and Almaleeh (2022); Mohammed and Al-Okdeh (2022); Thinh, Thuy and Tuan (2022); Ojo, Ogunsanwo, Adebayo and Oke (2022); Zaharum, Latif, Isa and Hanafi (2022); Mumtaz, Abdul and Mir (2022); Wajid, Ali and Metla (2021); Olaleye, Adesina and Sulaiman (2021); Okere, Okeke, Emili and Rufai (2021); Okanya, Efanga, Paseda and Emori (2021); Ndum (2021); Moslemany, El-Sherif and El-Mohr (2021); Mokuolu (2021); Ighoroje and Akpokerere (2021); Ajayi and Lawal (2021); Hacini, Boulenfad and Dahou (2021); Egbuhuzor and Ugo (2021); et cetera examining the impact of liquidity on the financial performance of deposit money banks, there is a gap in knowledge specific to Tier-1 deposit money banks in Nigeria. The existing studies carried out in Nigeria did not specifically focus on Tier-1 deposit money banks in Nigeria. The only study that did (Olaleye, Adesina & Sulaiman, 2021) neglected the issue of panel data by using time series method to carry out the study. This created a gap in knowledge which the present study fills up by determining the extent to which current ratio, cash ratio and quick ratio affect the Return on Assets of tier-1 deposit money banks in Nigeria.

2.0 Literature Review

2.1.1 Liquidity

The ability to pay off financial obligations without hindering regular operations and without incurring additional costs is referred to as liquidity (Azzam & Almaleeh, 2022). According to Ugwu et al. (2020), liquidity from a capital perspective is the availability of temporary assets for short-term investment. Simply put, liquidity is the ability of a company to have the funds it needs, especially to meet the demands of customers for withdrawals or loans, at all times and at a reasonable cost (Edewusi, Adeleke & Adekanmbi, 2020). When applied to the banking sector, liquidity refers to the funds available to a bank and its ability to handle emergency situations. Liquidity management involves the implementation of policies and measures to ensure that the bank has enough funds to meet its short-term obligations and minimize exposure to liquidity risks (Laminfoday, 2018). It is the capacity of a bank to maintain current financial assets, which allows for timely fulfillment of current financial obligations and to quickly fund asset growth if necessary (Mohammed & Al-Okdeh, 2022).

The evaluation of liquidity in banks is carried out through liquidity ratios, which assess the ability of banks to meet maturing short-term obligations. This is important in order to identify the risk of loss that arises when a bank does not have sufficient funds to meet deposit withdrawals and loan demands. Adequate liquidity is crucial for the credibility and stability of the banking and financial system and is a key factor in promoting sustainable economic growth and development (Ajayi & Lawal, 2021). Azzam and Almaleeh (2022) divide liquidity into two categories: market liquidity and funding liquidity. Market liquidity refers to the speed and ease with which an asset can be sold or marketed, while funding liquidity is focused on the ability of a firm to fund its short-term obligations (Okere et al., 2021).

2.1.2 Tools of Liquidity Management

Liquidity ratios are used as tools to assess the ability of the enterprise to meet its short-term obligations (Nworie & Ofoje, 2022). Proxies for liquidity in the banking sector include current ratio, liquid assets to total assets ratio, liquid assets to deposits ratio, liquid assets to customer and short-term funding, cash ratio, quick ratio, net working capital, cash and investment to total deposits ratio, etc.

2.1.2.1 Current Ratio

The Current Ratio, as defined by Zaharum, Latif, Isa, and Hanafi (2022), measures the ability of a business to meet its short-term obligations using its current assets. The ratio is calculated by dividing the value of the firm's current assets by its current liabilities, providing an insight into the relationship between the two (Ezekwesili, 2021). The higher the ratio, the more capable the firm is in meeting its short-term obligations with its current assets (Al-Armouti, 2017). The current ratio is an important tool for liquidity management, as it answers the question of whether the banking institution has enough cash and near-cash assets on hand to convert into cash and pay off short-term debts (Mohammed & Al-Okdeh, 2022). The formula for current ratio is given by dividing current assets by current liabilities.

$$\frac{\text{Current Assets}}{\text{Current Liabilities}}$$

2.1.2.2 Cash Ratio

The ability of a bank to pay its short-term obligations using its cash and cash equivalents is measured by the Cash Ratio. This ratio, defined by Alta'ani and Dali (2021) as the ratio of total cash balance to total deposits, evaluates the amount of cash that the bank has in relation to customer deposits. The focus of the Cash Ratio is on the bank's current amount of cash and its ability to convert cash equivalents into cash in order to meet customers' demands for withdrawals (Okanya et al., 2021).

In contrast to the Current Ratio, which measures the ability to pay off all debt in a short period, the Cash Ratio is specifically focused on meeting customers' needs for their deposits when required. It is a measure of the bank's short-term ability to operate without leaving any essential obligation unfulfilled, such as not granting customers' withdrawal requests. The Cash Ratio is calculated by dividing the sum of cash and cash equivalents by total deposits (Gitman & Zutter, 2012).

$$\frac{Cash\ and\ Bank\ Balances + Treasury\ Bills + Marketable\ Securies}{\text{Customers}' \text{ Deposits}}$$

2.1.2.3 Quick Ratio

The Quick Ratio is a measure of a company's ability to pay off its short-term obligations using assets that can be easily converted to cash (Okere et al., 2021). This ratio assesses the liquidity of a company and demonstrates its ability to satisfy its debts without delay. Quick ratio is especially important for banks as a significant portion of their liabilities, such as deposits, are payable on demand (Ajayi & Lawal, 2021).

Quick assets refer to assets that can be quickly converted to cash when needed to pay off debts. These assets include cash, bank balances, government debts, etc. (Egbuhuzor & Ugo, 2021). Companies may hold quick assets for various reasons, including the possibility of investing in more attractive growth opportunities later on. Quick assets are characterized by low returns, low transaction costs, low risk, and ease of conversion to cash (Ighoroje & Akpokerere, 2021).

When calculating the Quick Ratio, banks take into consideration only those assets that can be sold off and increase the cash on hand within a specified period of time. The formula for Quick Ratio is: (Quick Assets) ÷ (Current Liabilities) (Okere et al., 2021).

$$\frac{Cash\ and\ Bank\ Balances + Treasury\ Bills + Marketable\ Securies}{\text{Current Liabilities}}$$

2.1.3 Financial Performance

Financial performance, as defined by Okere, Okeke, Emili and Rufai (2021), is a measure that assesses the results of a company's operations and policies in monetary terms. The financial performance of a business provides insight into how effectively the company uses its resources to generate revenue (Nworie & Mba, 2022). It is usually demonstrated through the measure of profit, which is the amount of money left over after accounting for all expenses incurred during the generation of revenue. According to Hacini, Boulenfad and Dahou (2021), financial performance refers to the extent to which a company has achieved its economic goals. It is calculated over a certain time period to evaluate the overall financial health of the company. When a company generates profits by earning more income than its operating expenses, it indicates a good financial performance (Aggreh, Nworie & Abiahu, 2022). This, in turn, builds confidence among potential and existing investors in the ability of the company to generate, maintain, and increase its income (Olaleye, Adesina & Sulaiman, 2021).

High financial performance attracts investment, while low profit margins discourage investors. Financial performance generally involves the ability to generate revenue that exceeds expenses. This is usually measured through profitability ratios, such as Return on Assets (ROA), Return on Capital Employed (ROCE), Return on Equity (ROE), Earnings Per Share (EPS), Net Profit Margin (NPM), and Gross Profit Margin (GPM). In this study, the financial performance of listed deposit money banks in Nigeria was measured using Return on Assets (ROA).

2.1.3.1 Return on Asset

Financial efficiency in terms of generating profits from assets is measured by Return on Asset (ROA) (Swandewi & Purnawati, 2021). A higher ROA value indicates that the firm is performing well and that its management is effectively utilizing its assets to produce profits (Zaharum, Latif, Isa & Hanafi, 2022). The ROA metric is calculated as the net income earned by a company divided by the assets used in its operations (Hacini, Boulenfad & Dahou, 2021).

ROA is widely considered to be one of the most significant ratios in determining the efficiency and performance of banks. However, some argue that shareholders are less concerned with ROA and more focused on the return earned on their equity investment, which is measured by the Return on Equity (ROE) ratio (Ndum, 2021).

Despite this criticism, ROA has become a widely accepted measure of bank profitability over time. The ROA ratio reflects a company's ability to generate returns from its invested assets and is used to assess the management's effectiveness in utilizing these assets to yield profits. It is calculated as the profits earned per unit of assets, demonstrating how effectively the bank's assets are being managed to produce returns. The formula for calculating ROA is:

$$\frac{\text{Earnings After Tax}}{\text{Total Assets}}$$

2.1.4 Effect of Liquidity on Financial Performance

The primary goal of businesses, particularly in the banking sector, is to maximize their returns through their operations. Banks aim to achieve this by seeking out profitable investment opportunities and minimizing their inherent risks, such as liquidity risk, to avoid hindering their financial performance (Wajid, Ali & Metla, 2021). The relationship between liquidity and financial performance in banks becomes evident when they are faced with a situation where they need to sell a large portion of their illiquid assets to meet the demand for funds, which can result in a fire sale risk (Mumtaz, Abdul & Mir, 2022). This scenario could either cause the bank to offer discounts to attract buyers or impact the balance sheets of other banks as they may be forced to lower the values of their assets (Azzam & Almaleeh, 2022).

Banks can experience liquidity problems due to factors such as large-scale withdrawals by depositors, excessive reliance on long-term lending, and shocks in the economy (Mohammed & Al-Okdeh, 2022). Inadequate liquidity, whether in the form of insufficient or excess liquidity, can harm the financial performance of banks. While insufficient liquidity is dangerous, excess liquidity can negatively impact financial performance (Nworie, Moedu & Onyali, 2023) by limiting the bank's ability to effectively use its available funds for profitable purposes (Mohammed & Al-Okdeh, 2022). For a bank to perform well, it must be able to supply or withdraw the appropriate level of liquidity from the market in a manner that does not impede its profit-making operations. This is achieved through daily assessments of the banking system's liquidity conditions to determine the bank's liquidity needs and how much liquidity it should allocate or withdraw (Ajayi & Lawal, 2021, Sile, Olweny & Sakwa, 2019).

2.2 Theoretical Framework

2.2.1 Liquid Management Theory

The theory of liquidity management was first introduced by Dodds in 1982 (Wuave, Yua, & Yua, 2020). It encompasses the actions taken by banks to obtain funding from depositors and other creditors and determining the appropriate mix of funds for the bank (Edewusi, Adeleke, & Adekanmbi, 2020). The theory suggests that banks should concentrate on the liability side of their financial statement to meet their liquidity needs (Ighoroje & Akpokerere, 2021). This means that the bank can manage its liabilities in a way that they become a source of liquidity, allowing the bank to buy funds when needed (Wuave, Yua, & Yua, 2020). However, this theory has received criticism from some researchers, who argue that during times of low profits and business, banks may not be able to secure the required liquidity as their creditworthiness may be low and market confidence may have diminished (Wajid, Ali, & Metla, 2021).

The significance of the theory for this study is hinged on its highlights that the primary objective of liquidity management is to determine the funds needed to meet financial obligations and ensure the availability of cash or collateral to fulfill those needs as required (Wuave, Yua, & Yua, 2020). This is achieved by balancing various sources of funding during normal and stressful conditions. Effective liquidity management helps banks reduce their exposure to liquidity risk, which is crucial in today's competitive business environment. The theory emphasizes the importance of liquidity in the strategic decision-making process of deposit money banks to enhance their financial performance (Edewusi, Adeleke, & Adekanmbi, 2020).

2.3 Empirical Review

Table 1: Empirical Literature Reviewed

S/N	Author(S)	Year	Topic	Sample Size; Period Covered	Method of Data Analysis	Result
1.	Azzam and Almaleeh	2022	Effect of liquidity risk on performance of banks listed in Egyptian Stock Exchange	9 Egyptian banks; 2009-2019	Correlation and regression analysis	Cash ratio is positively associated with ROA and liquid assets ratio positively affects ROA

2.	Mohammed and Al-Okdeh	2022	Impact of liquidity on the financial performance of Jordanian banks	13 commercial banks; 2010 to 2019	Multiple regression analysis	Current ratio, net working capital, cash ratio negatively affect ROA
3.	Thinh, Thuy and Tuan	2022	Liquidity and profitability of Vietnamese listed banks	18 Vietnamese listed commercial banks; 2011 to 2019	Ordinary least square regression	Liquidity ratio has a positive relationship with return on assets
4.	Ojo, Ogunsanwo, Adebayo and Oke	2022	Effect of liquidity management on bank performance in Nigeria	13 banks; 1986-2020	Autoregressive distributed lag model	Cash reserve ratio and liquidity ratio, positively affect performance
5.	Zaharum, Latif, Isa and Hanafi	2022	Liquidity management and profitability of commercial banks in Malaysia	5 commercial banks; 2011-2020	Multiple regression analysis	Current ratio is positively related to ROA but cash ratio has no significant relationship with ROA
6.	Mumtaz, Abdul and Mir	2022	Effect of liquidity management factors on bank profitability in Pakistan	7 banks in Pakistan; 2010-2019	Correlation and regression analysis	Current ratio positively affects ROA but quick ratio has an insignificant negative effect on ROA
7.	Wajid, Ali and Metla	2021	Effect of liquidity risk management on the financial performance of commercial banks in Pakistan	25 listed commercial banks; 2006 to 2019	Ordinary Least Square analysis	Liquid assets to total assets and liquid assets to total deposit have a positive and significant effect on ROA
8.	Olaleye, Adesina and Sulaiman	2021	Effect of liquidity management on the profitability of commercial banks in Nigeria	5 Tier 1 banks; 1998 to 2018	Johansen test with the vector error correction model	Liquidity positively affects ROA and ROE but negatively affects net profit margin
9.	Okere, Okeke, Emili and Rufai	2021	Impact of liquidity management on the financial performance of quoted deposit money banks in Nigeria	15 Banks; 2007 to 2017	Panel least square regression and T-test	Current ratio has a significant and positive effect on the return on assets
10.	Okanya, Efanga, Paseda and Emori	2021	Impact of liquidity management on commercial bank performance in Nigeria	13 banks; 1981 to 2019	Auto-Regressive Distributed Lag (ARDL) Model	Liquidity management significantly affects bank performance in Nigeria
11.	Ndum	2021	Effect of liquidity on bank financial performance in Nigeria	8 banks; 2008-2019	Regression analysis	Liquidity risk management does not positively influence banks' performance
12.	Moslemany, El-Sherif and El-Mohr	2021	Impact of liquidity risk on profitability	38 banks; 2013 to 2019	Pooled regression, fixed effect and	Current ratio has no significant negative effect on ROA; cash

			in the Egyptian-banking sector		random effect analyses	ratio and liquidity ratio positively affect ROA
13.	Mokuolu (2021)	2021	Effect of liquidity management on profitability of deposit money banks in Nigeria	3 Nigerian Deposit Money Banks; 2008-2018	Pooled Least Square (PLS) regression analysis	Cash Reserve Requirement, Loan and Advances and total deposit have insignificant positive effect on the return on asset
14.	Ighoroje and Akpokerere	2021	Effect of liquidity management on bank's performance in Nigeria	14; 1980-2017	Error correction technique, Granger causality test and ARDL technique	Cash reserve ratio and loan deposit ratio do not have a significant positive effect on ROA but liquidity ratio has a significant positive effect on ROA
15.	Ajayi and Lawal	2021	Effect of liquidity management on bank performance in Nigeria	5 Deposit Money Banks; 2009-2018	Auto Regressive Distributed Lag (ARDL)	Loan to deposit ratio negatively affects ROA, loan to asset ratio positively affects ROA while liquid ratio does not significantly affect ROA
16.	Hacini, Boulenfad and Dahou	2021	Impact of liquidity risk management on the financial performance of selected conventional banks in Saudi Arabia	7 conventional banks; 2002-2019	Pool, Fixed-effects and Random-effects	Loan to deposit ratio and cash to deposit ratio have a significant negative impact on ROE
17.	Egbuhuzor and Ugo	2021	Effect of liquidity level on the financial performance of listed deposit money banks in Nigeria	13 listed deposit money banks; 2009 to 2018	Multiple regression analysis and the Pairwise Granger Causality tests	Current ratio has a negative and insignificant effect on return on assets and net profit margin
18.	Yahaya	2020	Effect of liquidity management on the profitability of manufacturing firms Nigeria	39 manufacturing firms; 2008-2017	Correlation matrix and Ordinary Least Square regression techniques	Current ratio has no positive significant effect on ROA while quick ratio has a negative and insignificant effect on ROA
19.	Wuave, Yua and Yua	2020	Effect of liquidity management on the financial performance of banks in Nigeria	5 listed banks; 2010 to 2018	Panel regression analysis	Liquidity ratio has positive and insignificant effect on ROA while cash reserve ratio negatively and insignificantly affect on ROA

20.	Ugwu, Ugwuoke, Egbere, Asogwa and Orji	2020	Effect of liquidity management on the performance of banks in Nigeria	18 banks; 2011 to 2017	Pearson correlation and regression analysis	Capital adequacy, liquidity ratio and asset quality have a significant positive effect on ROA
21	Edewusi, Adeleke and Adekanmbi	2020	Effect of liquidity risk management on bank performance in Nigeria	5 banks; 2013 - 2017	Pool regression of ordinary least square	Current ratio, liquid assets to total asset ratio and cash ratio have insignificant positive effect on ROA
22	Sile, Olweny and Sakwa	2019	Liquidity as a determinant of commercial banks' financial performance in Kenya	32 commercial banks; 2012 to 2016	Regression analysis	Liquidity has a negative and insignificant effect on ROA
23	Alali	2019	Effect of banking liquidity on the profitability of commercial banks in Jordan	14 listed Jordanian banks; 2013-2017	Regression analysis	Liquidity ratio has a significant negative effect on ROA
24.	Otekunrin, Fagboro, Nwanji, Asamu, Ajiboye and Falaye	2019	Effect of liquidity management on the financial performance of quoted deposit banks in Nigeria	15 money deposit banks; 2012–2017	Ordinary least square method (OLS)	Capital ratio, current ratio and cash ratio have positive effect on ROA
25.	Laminfoday	2018	Effect of liquidity risk management on the financial returns of commercial banks in Sierra Leone	8 commercial banks; 2013 to 2017	Multiple regression analyses	Liquidity risk management has a significant negative effect on ROA
26.	Vaita	2017	Effect of liquidity on the financial performance of tier one listed commercial banks in Kenya	6 tier one commercial banks; 2011 to 2015	Regression technique	Liquidity coverage ratio has a positive significant effect on ROA
27.	Okoth	2017	Effect of liquidity management ratios on the profitability of deposit taking financial institutions in Kenya	44 financial institutions; 2012 – 2016	Panel regression analysis model	Current ratio does not affect ROA; liquid ratio positively affects ROA
28.	Muriithi and Waweru	2017	Effect of liquidity risk on financial performance of commercial banks in Kenya	43 registered commercial banks; 2005 to 2014	Panel data techniques of random effects estimation	Liquidity coverage ratio does not influence financial performance
29.	Idowu, Essien and Adegboyega	2017	Liquidity management and banks' performance in Nigeria	4 deposit money banks; 2007 - 2016	Pearson correlation co-efficient	Liquidity is not related to return on asset

30.	Majakusi	2016	Effect of liquidity management on the performance of commercial banks in Kenya	28 commercial banks; 2010 to 2014	Regression model	Liquidity management has a positive and significant effect on ROA
31.	Gbegi, Abdullahi and Terseer	2016	Effect of liquidity management on financial performance of Nigerian banks	5 banks; 2010 to 2015	Panel regression analysis	Liquidity ratio positively affects ROA
32.	Nyabate	2015	Effect of liquidity on performance of listed financial institutions listed in Kenya	19 financial institutions; 2010-2014	Pearson's correlation and regression analysis	Liquidity has a negative but insignificant effect on the ROA
33.	Mwangi (2014)	2014	Effect of liquidity risk management on the financial performance of Commercial Banks in Kenya	43 Commercial banks; 2010-2013	Ordinary Least Squares	Liquid assets ratio has a negative effect on return on assets

Source: Scholarly literatures compiled, 2022

3.0 Material and Method

This study adopted *Ex-post facto* research design in order to examine how liquidity affects financial performance. The population of this study is the entire five (5) tier-1 Deposit Money Banks in Nigeria as at December 31st, 2022. The sample of this study was also confined to the Tier 1 banks. The reason is because the capital of Tier 1 banks displays robust financial strength as shown in their equity capital and disclosed reserves (Olaleye, Adesina & Sulaiman, 2021). Therefore, the five listed deposit money banks that constitute the population and also the sample size of the study are Access bank, First bank, Guaranty Trust bank, United bank of Africa and Zenith bank.

The data used in the study were collected through the annual reports of the selected deposit money banks over a ten year period, from 2011 to 2020. The panel data estimation technique was adopted as it addresses the heterogeneity among individual banks by incorporating individual specific variables and provides more comprehensive information by combining time-series and cross-sectional observations. Panel data regression through Fixed Effect Model was deployed, after Hausman test was carried out. The study adopted and modified the functional model used by Olaleye, Adesina, and Sulaiman (2021) in their study of the impact of liquidity management on the profitability of commercial banks in Nigeria. The modified model is:

ROA = f (CUR, CASR, QR, CAR) ……. (1)

Where,

CASR = Cash ratio

However, the present study excludes capital ratio from the predictors. Therefore, the modified functional model is thus:

ROA = f (CUR, CAR, QUR) ……. (2)

Where,

ROA = Return on Assets

CUR = Current ratio

CAR = Cash ratio

QUR = Quick ratio

f = functional notation.

The econometric form of the functional model above is expressed as:

$ROA_{it} = \alpha_0 + \beta_1 CUR_{it} + \beta_2 CAR_{it} + \beta_3 QUR_{it} + \mu_{it}$ ……. (3)

Where:

α_0 = Intercept

$\beta_1 - \beta_3$ = are the parameters to be estimated in the equation

ROA_{it} = Return on Assets for firm *i* in period *t*

CUR_{it} = Current ratio for firm *i* in period *t*

CAR_{it} = Cash ratio for firm *i* in period *t*

QUR_{it} = Quick ratio for firm *i* in period *t*

μ_{it} = Error term for firm *i* in period *t*

The variables of the study are measured as shown in **Table 3.1** below.

Table 3.1 Description of Operational Variables of the Study

Proxies	Description and Measurement	Source
Return on Assets	$\frac{Earnings\ After\ Tax}{\text{Total Assets}}$	Ighoroje and Akpokerere (2021)
Current Ratio	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$	Egbuhuzor and Ugo (2021)
Cash Ratio	$\frac{Cash\ and\ Bank\ Balances + Treasury\ Bills + Marketable\ Securies}{Customers'\ Deposits}$	Alta'ani and Dali (2021)
Quick Ratio	$\frac{Cash\ and\ Bank\ Balances + Treasury\ Bills + Marketable\ Securies}{\text{Current Liabilities}}$	Moslemany, El-Sherif and El-Mohr (2021)

Source: Researcher's Conceptualization, 2022

4.0 Result and Discussion

4.1 Presentation of Data

The proxies for the independent variable (liquidity) are current ratio (CUR), quick ratio (QUR) and cash ratio (CAR) while the proxy for the dependent variable is Return on Assets (ROA). The data collected for the variables are presented in **Tables 4.1, Table 4.2, Table 4.3** and **Table 4.4.**

Table 4.1 Data for Return on Assets

Bank/ Year	Access	First Bank	GTB	UBA	Zenith Bank
2011	.0055	.0093	.0339	.0048	.0190
2012	.0236	.0257	.0526	.0245	.0393
2013	.0154	.0183	.0449	.0210	.0290
2014	.0202	.0227	.0419	.0171	.0270
2015	.0273	.0000	.0414	.0215	.0263
2016	.0199	.0141	.0475	.0187	.0266
2017	.0147	.0072	.0562	.0141	.0317
2018	.0185	.0107	.0615	.0114	.0334
2019	.0111	.0119	.0565	.0152	.0332
2020	.0105	.0117	.0439	.0109	.0278

Source: Researcher's Computation (2022)

The lowest ROA of Access bank was .0055 earned in 2011 while its highest ROA was .03 realised in 2015. First Bank's highest ROA was .0257 earned in 2012 while its lowest ROA was 0.000 earned in 2015, when the Profit for the Year was less than 1% for First Bank. GTB has its lowest ROA of .0339 in 2011 and its highest ROA of .0615 in 2018. The highest ROA of UBA was .0245 got in 2012 while its lowest ROA was .0048 got in 2011. Finally, Zenith Bank realised its highest ROA of .0393 in 2012 and its lowest ROA of .0190 in 2011. Among all the banks, GTB whose ROA was .0615 in 2018 has the highest ROA while First Bank whose ROA was .0000 in 2015 has the lowest ROA.

Table 4.2 Data for Current Ratio

Bank/ Year	Access	First Bank	GTB	UBA	Zenith Bank
2011	.9582	.8440	1.1448	.7631	1.1193
2012	.7563	.8753	1.1335	.8271	1.1401
2013	.8937	.9129	.9135	.8029	1.2131
2014	.9924	1.0508	.9233	.9277	1.3340
2015	1.0764	.9279	1.0153	.8841	1.3628
2016	1.0338	1.0041	.9706	.9973	1.3999
2017	.9987	.8867	.9983	1.0140	1.4401
2018	.8145	.7528	.8076	.9141	1.3614
2019	.7006	.7423	.8060	.9748	1.2662
2020	.6672	.8184	.6562	.8396	1.4089

Source: Researcher's Computation (2022)

Access Bank has its highest CUR of 1.0764 in 2015 and its lowest CUR of .6672 in 2020. First Bank has its lowest CUR of .7423 in 2019 and its highest CUR of 1.0508 in 2014. The highest CUR of GTB was 1.1448 in 2011 while its lowest was .6562 in 2020. UBA had its highest CUR of 1.0140 in 2017 and its lowest CUR of .7631 in 2011. Zenith Bank experienced its highest CUR of 1.4401 in 2017 and its lowest CUR of 1.1193 in 2011. Overall, the banking firm with the highest current ratio among the five banks was Zenith banks whose CUR was 1.4401 in 2017. On the other extreme, GTB whose CUR was .6562 in 2020 had the lowest CUR among the sampled banking firms.

Table 4.3 Data for Cash Ratio

Bank/ Year	Access	First Bank	GTB	UBA	Zenith Bank
2011	.2518	.1130	.4809	.2900	.4472
2012	.2597	.1336	.4532	.4311	.5333
2013	.3252	.2114	.1921	.3456	.5546
2014	.2651	.2663	.1163	.4143	.4334
2015	.2657	.2851	.1393	.3700	.4573
2016	.1212	.2652	.1391	.3596	.4274
2017	.1322	.2042	.2682	.3875	.6221
2018	.1643	.1874	.2452	.4188	.6094
2019	.1570	.2551	.1902	.4278	.4881
2020	.1220	.3334	.1712	.3757	.6739

Source: Researcher's Computation (2022)

The nethermost Cash Ratio for Access Bank was .1212 in 2016 while its uppermost Cash Ratio was .3252 in 2013. First Bank had its highest CAR of .3334 in 2020 and its lowest CAR of .1130 in 2011. The lowest CAR of GTB was .1163 in 2014 whereas its highest CAR was .4809 in 2011. UBA attained its highest CAR of .4311 in 2012 and its lowest CAR of .2900 in 2011. Zenith Bank had its lowest CAR of .4274 in 2016 and its highest CAR of .6739 in 2020. Overall, Zenith bank had the highest Cash Ratio of .6739 in 2020 while First bank had the lowest CAR of .1130 in 2011.

Table 4.4 Data for Quick Ratio

Bank/ Year	Access	First Bank	GTB	UBA	Zenith Bank
2011	.2005	.1085	.4639	.2843	.4438
2012	.2541	.1312	.4437	.4241	.5318

2013	.3081	.2080	.1893	.3453	.5532
2014	.2395	.2628	.1145	.4135	.4319
2015	.2541	.2786	.1375	.3698	.4568
2016	.1149	.2593	.1375	.3532	.4263
2017	.1152	.1681	.2641	.3841	.6207
2018	.1263	.1537	.2422	.4135	.6081
2019	.1213	.2095	.1884	.4138	.4872
2020	.1041	.2745	.1700	.3640	.6725

Source: Researcher's Computation (2022)

Access Bank has its highest QUR of .3081 in 2013 and its lowest QUR of .1041 in 2020. First Bank has its lowest QUR of .1085 in 2011 and its highest QUR of .2786 in 2015. The highest QUR of GTB was .4639 in 2011 while its lowest was .1145 in 2014. UBA had its highest QUR of .4241 in 2012 and its lowest QUR of .2843 in 2011. Zenith Bank experienced its highest QUR of .6725 in 2020 and its lowest QUR of .4263 in 2016. Overall, the banking firm with the highest QUR among the five banks was Zenith banks whose QUR was .6725 in 2020. On the other extreme, Access bank whose QUR was .1041 in 2020 had the lowest QUR among the sampled banking firms.

4.2 Descriptive Statistical Analysis of the Data

The descriptive result is given in Table 4.5.

Table 4.5 Descriptive Statistics of the Data

	ROA	CUR	CAR	QUR
Mean	0.024626	0.981333	0.315626	0.304819
Maximum	0.061537	1.440071	0.673916	0.672490
Minimum	0.000000	0.656171	0.112998	0.104080
Std. Dev.	0.014662	0.201717	0.147669	0.152169
Skewness	0.766398	0.702058	0.484711	0.511352
Kurtosis	2.888814	2.790299	2.402719	2.365488
Jarque-Bera	4.920467	4.198988	2.701093	3.017767
Probability	0.085415	0.122518	0.259099	0.221157
Observations	50	50	50	50

Source: E-View Version 10 Output

From the descriptive analysis in **Table 4.5**, the means of ROA, CUR, CAR and QUR are 0.024626, 0.981333, 0.315626 and 0.304819, respectively. The means of ROA, CUR, CAR and QUR have respective standard deviations of 0.014662, 0.201717, 0.147669 and 0.152169. The uppermost ROA was 0.061537 while the lowest ROA was 0.00. CUR ranged from 0.656171 to 1.440071 while CAR ranged from 0.112998 to 0.673916. The minimum value of QUR was 0.104080 while its maximum value was 0.672490. ROA, CUR, CAR and QUR have positive skewness. None of the variables have mesokurtic property because all their kurtosis were less than 3. Therefore, the distributions of data for ROA, CUR, CAR and QUR are platykurtic because their kurtosis values are less than 3. The use of the Jarque-Bera statistics was to ascertain whether the distribution of the data significantly deviated from a normal distribution. All the probabilities of the Jarque-Bera statistics are greater than 0.05. Therefore, the null hypothesis that all the data are normally distributed was accepted. In conclusion, there are no outliers in the distribution of ROA, CUR, CAR and QUR.

4.2.1 Hausman-Specification Test

Hausman-specification test was carried out to determine whether Fixed Effect or Random Effect was most appropriate for the study. The result of the test is shown in **Table 4.6.**

Table 4.6 Hausman-Specification Test

Correlated Random Effects - Hausman Test
Equation: RANDOM
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	71.054256	3	0.0000

Source: E-View Version 10 Output

The Hausman-specification test returned Chi-Sq. Statistic = 71.054256. The alternate hypothesis that Fixed Effect Model is more appropriate was accepted because the Prob. = 0.000 is less than 0.05. In conclusion, the study adopted Fixed Effect Model of Panel Least Square regression.

4.3 Hypotheses Testing

The test of hypothesis of the study was carried out with the use of Panel Least Square regression analysis. Panel data estimation technique was adopted because in order to take care of the heterogeneity associated with individual banks by allowing for individual specific variables. The regression model was a multiple regression technique whereby the composite effect of CUR, CAR and QUR on ROA was examined with the aid of the under-stated model:

$$ROA_{it} = \alpha_0 + \beta_1 CUR_{it} + \beta_2 CAR_{it} + \beta_3 QUR_{it} + \mu_{it}$$

The result of the Fixed Effect Model is shown in **Table 4.7.**

Table 4.7 Panel Least Square Regression Result

Dependent Variable: ROA
Method: Panel Least Squares
Date: 08/10/22 Time: 19:18
Sample: 2011 2020
Periods included: 10
Cross-sections included: 5
Total panel (balanced) observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CUR	-0.006216	0.009180	-0.677115	0.5020
CAR	-0.224068	0.083716	-2.676528	0.0106
QUR	0.242712	0.087521	2.773176	0.0082
C	0.027464	0.008182	3.356522	0.0017

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.830731	Mean dependent var	0.024626
Adjusted R-squared	0.802519	S.D. dependent var	0.014662
S.E. of regression	0.006516	Akaike info criterion	-7.083517
Sum squared resid	0.001783	Schwarz criterion	-6.777593
Log likelihood	185.0879	Hannan-Quinn criter.	-6.967019
F-statistic	29.44645	Durbin-Watson stat	1.879172
Prob(F-statistic)	0.000000		

Source: E-View Version 10 Output

The above results of Fixed Effect Regression was used to evaluate the model with respect to Adjusted R^2, F-statistic, Durbin-Watson Stat, Coefficients and t-stat. The R-Squared, also known as coefficient of determination and Adjusted R-squared known as coefficient of multiple determination, are statistical terms used to show how good the model is at predicting the dependent variable. The Adjusted $R^2 = 0.802519$, indicates that 80.25% of the variation in ROA was determined by CUR, CAR and QUR.

The F-statistic was also used to identify the fitness of the model while the corresponding *p*-value of the F-statistic was used to determine the significance of the joint parameter. The value of the F-statistic = 29.44645 showed that the joint parameters are

significant in predicting the ROA of listed deposit money banks since the Prob(F-statistic) = 0.00000 is less than 0.05. The Durbin–Watson test statistic was 1.879172 denoting that there is no issue of auto-correlation among the residuals.

4.3.1 Hypothesis One

1. Current ratio has no significant effect on the return on assets of listed deposit money banks in Nigeria.

The test of the first null hypothesis determined the effect of current ratio on the ROA of listed deposit money banks in Nigeria. Current Ratio has a negative coefficient of -0.006216 which symbolizes that CUR has a negative impact on ROA. An increase in CUR by 1% percentage point will lead to a decrease in ROA by 0.006216. The null hypothesis was accepted because the t-Statistic = -0.677115 was lower than 2, and the Prob(t) = 0.5020 was greater than 0.05. In conclusion, current ratio has no significant negative effect on the return on assets of listed deposit money banks in Nigeria (β_1 = -0.006216, *p*-value = 0.5020). This means that having excessively high amount of current assets compared to current liabilities does not enhance the performance of the firms, instead, it jeopardizes the financial objective of the firm to earning more returns on assets. By implication, only an optimal level of current assets is necessary to keep the liquidity position of the banks healthy. Anything higher than this translates to reduction in the ROA of the banks. This finding is in line with the study conducted by Mohammed and Al-Okdeh (2022); Moslemany, El-Sherif and El-Mohr (2021); Egbuhuzor and Ugo (2021) but disagreed with those of Zaharum, Latif, Isa and Hanafi (2022); Mumtaz, Abdul and Mir (2022); and Okere, Okeke, Emili and Rufai (2021).

4.3.2 Hypothesis Two

2. Cash ratio has no significant effect on the return on assets of listed deposit money banks in Nigeria.

The test of the second null hypothesis determined the effect of cash ratio on the ROA of listed deposit money banks in Nigeria. Cash Ratio has a negative coefficient of -0.224068 which symbolizes that CAR has a negative impact on ROA. An increase in CAR by 1% percentage point will lead to decrease in ROA by 0.224068. The alternate hypothesis was accepted because the t-Statistic = -2.676528 was higher than 2, and the Prob(t) = 0.0106 was less than 0.05. In conclusion, cash ratio has a significant negative effect on the return on assets of listed deposit money banks in Nigeria (β_2 = -0.224068, *p*-value = 0.0106). This means that having excessively high amount of cash and cash equivalents compared to customers' deposits does not enhance the performance of the firms, instead, it jeopardizes the financial objective of the firm to earning more returns on assets. By implication, only an optimal level of cash and cash equivalents is necessary to attend to the withdrawal needs of customers. This finding agrees with the results of Mohammed and Al-Okdeh (2022); but negated the findings of Azzam and Almaleeh (2022); Zaharum, Latif, Isa and Hanafi (2022); and Moslemany, El-Sherif and El-Mohr (2021).

4.3.3 Hypothesis Three

3. Quick ratio has no significant effect on the return on assets of listed deposit money banks in Nigeria.

The test of the third null hypothesis determined the effect of quick ratio on the ROA of listed deposit money banks in Nigeria. Quick Ratio has a positive coefficient of 0.242712 which symbolizes that QUR has a positive impact on ROA. An increase in QUR by 1% percentage point will lead to an increase in ROA by 0.242712. The alternate hypothesis was accepted because the t-Statistic = 2.773176 was higher than 2, and the Prob(t) = 0.0082 was less than 0.05. In conclusion, quick ratio has a significant positive effect on the return on assets of listed deposit money banks in Nigeria (β_3 = 0.242712, *p*-value = 0.0082). This means that increasing the Quick Ratio of the banks by a unit tends to increase the ROA of the banks by 0.242712. The decision to hold quick assets is motivated by a variety of considerations one of which is to allow the bank invest in a more attractive growth opportunity that may present itself later. This finding corroborates with the results of Thinh, Thuy and Tuan (2022). However, the finding opposed the results of Mumtaz, Abdul and Mir (2022). The reason for the difference between the findings of the previous researchers and the present study could be as a result of the disparity in methodology, including sample size and time scope.

5.0 Conclusion and Recommendations

Deposit money banks seek to achieve the financial objectives that allow them to survive and harmonize profitability goals and liquidity goals to ensure their continuity, avoid bankruptcy and achieve the highest possible return. Thus, liquidity crisis is avoided by managing current assets through ratios such as current ratio, cash ratio and quick ratio. The ability to maintain a sound liquidity position that would enhance effective and efficient operations enhances the financial performance of the banks. The findings of the study are a proof that although banks indeed require liquid or quick assets since a large proportion of their liabilities are typically deposits and are equally payable on demand, inadequate liquidity has a detrimental effect on the survival and sustainability of banks. The study therefore recommends the following:

1. The management of deposit money banks should ensure they have sufficient liquidity that can satisfy short obligations after which the excess should be invested in profitable ventures.

2. The management of deposit money banks should always convert smaller percentage of banks' assets to cash especially when the banks would be able to meet most cash needs of customers using the cash at hand. This will prevent a situation whereby the banks store up idle cash that do not enhance the ROA of the banks.

3. Bank managers should deploy adequate quick assets management approach in order to enable the banks have ample convertible assets since a large proportion of their liabilities are typically deposits and also payable on demand.

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