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LIQUIDITY MANAGEMENT AND PROFITABILITY OF LISTED DEPOSIT MONEY BANKS IN NIGERIA: EVIDENCE FROM PANEL DATA

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ABSTRACT

This study examined the effect of liquidity management on the profitability of listed deposit money banks in Nigeria over the period 2011–2025. Specifically, the study investigated the effects of loan to deposit ratio (LDR), loan to asset ratio (LAR), and cash ratio (CR) on profit after tax (PAT) and earnings per share (EPS). Ex-post facto research design was adopted, using panel data obtained from the annual reports and financial statements of five selected listed deposit money banks in Nigeria. The data were analyzed using descriptive statistics, correlation analysis, variance inflation factor, panel unit root tests, and panel regression techniques. The Hausman specification test supported the use of the random-effects model, while diagnostic tests were conducted to assess the suitability of the estimated models. The findings revealed that LDR had a positive but insignificant effect on PAT and EPS, while LAR had a negative but insignificant effect on both PAT and EPS. Cash ratio had a positive but insignificant effect on PAT but a negative and insignificant effect on EPS. None of the six liquidity-management relationships examined was statistically significant. The study concluded that liquidity management (LDR, LAR, and CR) did not significantly influence the profitability of listed deposit money banks in Nigeria during the study period. It therefore recommended that bank management should maintain an optimal balance between liquidity and profitable asset deployment while strengthening credit management, cash-flow planning, and overall financial performance strategies.

Keywords: Liquidity Management, Bank Profitability, Loan-to-Deposit Ratio, Loan-to-Asset Ratio, Cash Ratio, Profit after Tax, Earnings per Share, Deposit Money Banks.

Introduction

Liquidity management remains one of the most critical operational concerns for banks worldwide, given the peculiar nature of their business, which involves transforming short-term deposits into longer-term loans and investments. According to Galletta and Mazzù (2019), this structural mismatch exposes banks to the constant challenge of balancing the need to meet withdrawal and settlement obligations against the pressure to deploy funds profitably. Segura and Suárez (2017) demonstrated that excessive maturity transformation by banks significantly heightens their exposure to liquidity-related risk, particularly during periods of funding

stress. Santos and Suárez (2019) established that the adoption of formal liquidity standards materially affects how banks price and manage their liquid asset holdings, underscoring **that** liquidity decisions are neither trivial nor cost-free.

According to Alley, Hassan, Wall, and Suleiman (2023), the Nigerian banking sector has undergone substantial regulatory restructuring aimed at strengthening capital and liquidity buffers. Edem (2017) traced the liquidity management practices of Nigerian deposit money banks and linked recurring liquidity strains to the sector's history of undercapitalization prior to the 2004–2005 consolidation exercise. More recently, Akpan (2025) observed that despite earlier consolidation reforms raising the minimum capital base, the sector continued to grapple with inadequate capital buffers and weak intermediation, prompting further recapitalization policies. Consequently, these developments have placed sustained regulatory attention on how listed deposit money banks manage liquidity while still meeting shareholder profitability expectations on the Nigerian Exchange.

Arin, Nyahas, and Ekoja (2024) opined that as banking systems adapt to evolving prudential guidelines—including the Basel liquidity coverage standards and fluctuating domestic central bank interventions—bank managers require precise empirical evidence on how specific liquidity metrics affect profitability. Providing evidence on how deposit money banks manage their liquidity, as well as the actual effect on their profitability, is therefore the focus of this study.

Statement of the Problem

Despite ongoing regulatory efforts to strengthen the capital and liquidity positions of Nigerian banks, these institutions continue to grapple with the practical difficulty of balancing adequate liquidity against the pressure to deliver competitive returns to shareholders (Akpan, 2025). Banks that hold excessive liquid assets risk underutilizing resources that could otherwise be deployed to generate income. Conversely, those that lend aggressively in pursuit of higher earnings expose themselves to the risk of being unable to meet maturing obligations. This tension has direct consequences for shareholder value, as reflected in profit after tax and earnings per share. Ultimately, this is not a resolved historical concern, but an active operational reality confronting bank management and regulators alike. It raises the critical question of whether current liquidity management practices among listed deposit money banks (DMBs) are genuinely optimized to support, rather than undermine, profitability.

Beyond this practical concern lies a deeper empirical problem: existing studies examining liquidity management and profitability among Nigerian deposit money banks (DMBs) have produced inconsistent findings, leaving no settled consensus for practitioners or scholars. On one hand, several studies point to a positive relationship. Edem (2017) found that liquidity management significantly

influenced the performance of Nigerian DMBs over an extended period, while Onyekwelu et al. (2018) similarly reported a positive and significant effect on both profitability ratios and return on capital employed. Furthermore, Otekunrin et al. (2019) observed that current and cash ratios positively related to return on assets, Okere et al. (2021) established a significant association between liquidity management and financial performance, and Alalade et al. (2020) found that liquidity risk had significant positive effects on return on equity, return on assets, and earnings per share.

In contrast, other researchers have documented negative or statistically insignificant outcomes. For instance, Bashiru et al. (2022) found that liquidity ratios exerted a significant negative effect on the financial performance of listed DMBs, whereas Adesina and Adewumi (2022) observed a positive but statistically insignificant effect on return on capital employed. Adding to this complexity, El-Maude et al. (2022) reported mixed results within a single study: the cash-to-total-assets ratio had a significant positive effect on return on assets, the cash-to-total-deposit ratio had a significant negative effect, and the liquid-assets-to-total-assets ratio showed only an insignificant positive effect.

This persistent lack of consensus—spanning contradictory results even for identical proxies across different studies—indicates that the true relationship between liquidity management and profitability among Nigerian listed DMBs remains empirically unresolved. Against this backdrop, this study investigates the effect of the loan-to-deposit ratio, loan-to-asset ratio, and cash ratio on profit after tax and earnings per share among deposit money banks in Nigeria.

Research Objectives

The study objectives include to:

(i) Examine the effect of loan to deposit ratio (LDR) on profit after tax (PAT);
(ii) Determine the effect of loan to asset ratio (LAR) on profit after tax (PAT);
(iii) Analyze the effect of cash ratio (CR) on profit after tax (PAT);
(iv) Evaluate the effect of loan to deposit ratio (LDR) on earnings per share (EPS);
(v) Investigate the effect of loan to asset ratio (LAR) on earnings per share (EPS);
(vi) Assess the effect to cash ratio (CR) on earnings per share (EPS).

Research Questions

The following questions will guide the study:

(i) What effect does loan to deposit ratio (LDR) have on profit after tax (PAT)?
(ii) To what extent has loan to asset ratio (LAR) affected profit after tax (PAT)?
(iii) What is the effect of cash ratio (CR) on profit after tax (PAT)?

(iv) What effect doe loan to deposit ratio (LDR) have on earnings per share (EPS)?
(v) To what extent does loan to asset ratio (LAR) affect earnings per share (EPS)?
(vi) What is the effect of cash ratio (CR) on earnings per share (EPS)?

Research Hypotheses

The hypotheses for this study are stated thus:

H_{01}: Loan to deposit ratio (LDR) does not have any significant effect on profit after tax (PAT).

H_{02}: Loan to asset ratio (LAR) has not significantly affected profit after tax (PAT).

H_{03}: Cash ratio (CR) has no significant effect on profit after tax (PAT).

H_{04}: Loan to deposit ratio (LDR) does not have any significant effect on earnings per share (EPS).

H_{05}: Loan to asset ratio (LAR) has not significantly affected earnings per share (EPS).

H_{06}: Cash ratio (CR) has no significant effect on earnings per share (EPS).

Justification and Significance of the Study

This study is justified by the persistent inconsistency in empirical findings on the relationship between liquidity management and profitability of listed deposit money banks in Nigeria. While some studies report positive and significant effects, others find negative or insignificant relationships, particularly across different liquidity measures. This inconsistency indicates the need for further empirical evidence to clarify how liquidity management influences bank profitability.

This study will be significant to bank management, by providing evidence on liquidity management and profitability; regulatory authorities, by providing empirical evidence that may inform liquidity-related regulatory and supervisory decisions; to shareholders and investors, by improving their understanding of how liquidity decisions relate to bank profitability; and for researchers and academics, by contributing additional evidence to the existing literature which provides a basis for further studies on the subject matter of liquidity management and profitability in Nigeria.

Scope of the Study

This study examines the effect of liquidity management on the profitability of listed deposit money banks in Nigeria. Specifically, it covers three liquidity management measures namely loan to deposit ratio (LDR), loan to asset ratio (LAR), and cash ratio (CR) while profitability is measured using profit after tax (PAT) and earnings per share (EPS). The study covers listed deposit money banks in Nigeria over the period 2011 to 2025 using relevant financial information obtained from their published annual reports and accounts.

Conceptual Framework

The conceptual framework examining the relationship between liquidity management and profitability of deposit money banks is illustrated using the diagram below.

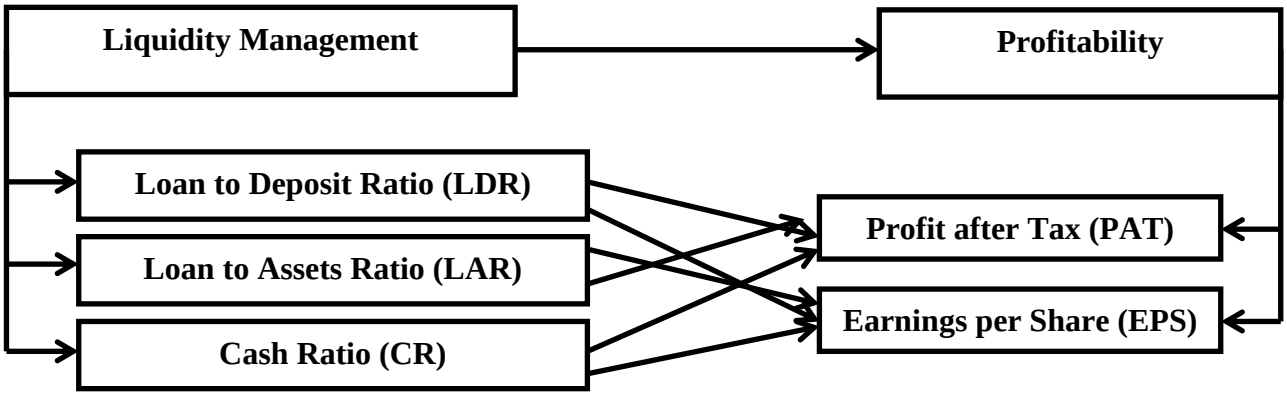


Fig 2.1: Operational Conceptual Framework
Source: Researcher's Conceptualization (2026)

Concept of Liquidity Management

Liquidity management refers to the process through which banks maintain and strategically allocate sufficient liquid resources to meet expected and unexpected financial obligations while continuing their core intermediation activities (Agbada & Osuji, 2013; Edem, 2017). For deposit money banks, liquidity is particularly important because they transform relatively short-term, withdrawable deposits into longer-term, less liquid loans and investments. DeYoung and Jang (2016) show that banks actively manage their liquidity positions by targeting key balance-sheet liquidity relationships, demonstrating that liquidity management involves deliberate adjustments to funding and asset positions rather than simply holding cash. Similarly, Berger et al. (2016) explain that banks' liquidity creation is closely connected to their lending and funding activities, while Diamond and Rajan (2011) emphasize that the interaction between bank liquidity and potential asset liquidation can affect a bank's ability to continue financial intermediation during periods of stress. Ultimately, effective liquidity management requires maintaining adequate liquid assets and reliable funding sources while deploying resources efficiently into income-generating activities.

"In this study, liquidity management refers to a deposit money bank's capacity to balance its lending activities, asset composition, and liquid reserves against its deposit liabilities. This balance is critical: excessive liquidity traps resources in low-yielding assets and depresses earnings potential, whereas deficient liquidity exposes the institution to funding shortfalls

and an inability to meet immediate withdrawal demands. Foundational literature demonstrates that liquidity conditions are closely intertwined with funding and credit risks (Diamond & Rajan, 2011; Imbierowicz & Rauch, 2014) as well as capital and risk-taking decisions (Brunnermeier et al., 2018). More recent evidence further highlights that a bank's liquidity stance involves navigating a persistent trade-off between satisfying immediate liquidity demands and performing maturity transformation (Dietrich & Gehrig, 2025). Consequently, liquidity management is operationalized as a continuous process of safeguarding financial stability and solvency without forfeiting profitable lending and investment opportunities.

Concept of Bank Profitability

Bank profitability refers to the ability of a banking institution to generate sufficient earnings from its assets, equity, lending, investments, and other operating activities after accounting for operational costs and risks (Bortoluzzo, Ciganda, & Bortoluzzo, 2024). It is a key indicator of a bank's financial health, sustainability, and efficiency, as sustained profitability enables institutions to absorb losses, strengthen their capital base, reward shareholders, and continue financial intermediation. In banking literature, profitability is commonly measured using return on assets (ROA), return on equity (ROE), net interest margin (NIM), and other profit-based metrics, with the appropriate measure depending on the focus of the study (Almaqtari et al., 2019; Ozili, 2021). Specifically, ROA captures the ability of a bank to generate earnings from its asset base, whereas ROE reflects the returns generated on shareholders' equity, and NIM focuses on the profitability of interest-generating activities. Empirical evidence further indicates that bank profitability is influenced by a combination of bank-specific, industry-specific, and macroeconomic factors, including operational efficiency, asset quality, capitalization, liquidity, size, market conditions, and broader economic activity (Almaqtari et al., 2019). In Nigeria, evidence also shows that profitability is closely linked to cost efficiency, bank size, overhead costs, capital adequacy, liquidity, and credit quality. This confirms that profitability is the outcome of several interconnected financial and operational decisions rather than a single aspect of bank performance (Olalere et al., 2017; Ozili, 2019).

Sources of Liquidity in Deposit Money Banks

"The principal source of liquidity for deposit money banks is customer deposits—particularly demand, savings, and other relatively stable deposits—that provide banks with funds that can be transformed into loans and investments (Adegbite & Azeez, 2018). Deposits are important because banks finance relatively illiquid assets with liabilities that are generally more liquid and redeemable, thereby creating a maturity and liquidity transformation role at the core of banking (Diamond & Rajan, 2012). DeThe [DeYoung] and Jang (2016) further demonstrate that banks actively

manage the relationship between their loan portfolios and core deposits, suggesting that deposit funding is central to banks' liquidity management decisions. In addition to customer deposits, banks can obtain liquidity through the interbank market, where institutions with surplus funds lend to those experiencing temporary liquidity shortages. Interbank markets therefore facilitate the redistribution of cash reserves across banks and constitute an important mechanism for day-to-day liquidity management (Bech & Monnet, 2016).

Theoretical Framework

This study is anchored on the Liquidity Preference Theory propounded by John Maynard Keynes in 1936. The theory explains that economic agents prefer to hold liquid assets because liquidity provides security and flexibility in meeting immediate financial obligations, although holding excessive liquidity may involve an opportunity cost because funds that remain highly liquid may not be invested in income-generating activities. The theory is particularly applicable to this study because deposit money banks must continuously balance the need to maintain sufficient liquidity against the need to deploy funds through loans and other productive assets to generate returns. Thus, the loan to deposit ratio (LDR), loan to asset ratio (LAR), and cash ratio (CR) provide relevant measures of how banks manage their liquid resources and allocate funds, while profit after tax (PAT) and earnings per share (EPS) capture the resulting profitability available to the bank and its shareholders. The theory provides a logical basis for examining how variations in liquidity management may affect the profitability of listed deposit money banks in Nigeria.

Empirical Literature Review

Onyebuenyi and Ikpeoha-Felix (2026) examined the liquidity-profitability trade-off among listed deposit money banks in Nigeria. This study adopted an ex-post facto and longitudinal panel research design. Data covering a ten-year period from 2015 to 2024 were sourced from the audited financial statements of twelve (12) purposively selected listed banks. Data analysis was done using descriptive statistics, and panel estimated generalized least squares (EGLS) regression. The results of analysis revealed that liquidity ratio has a significant negative effect on profitability; loan-to-deposit ratio has an insignificant positive effect on return on assets (ROA).

Ali and Urum (2025) investigated the impact of liquidity management on the profitability of listed deposit money banks in Nigeria. This study adopted the ex-post facto research design as it made use of secondary data sourced from a population of twenty-two (22) deposit money banks listed on the Nigerian exchange group. A sample of 10 banks was selected using stratified random sampling technique; and relevant data for the study was sourced from the published annual reports of the selected banks. The fully modified ordinary least squares (FMOLS) regression technique and Pearson correlation technique was applied for data analysis; and the findings of this study revealed that current ratio and cash ratio

have significant positive effects on profitability, while acid test ratio has an insignificant negative effect on profitability. It further revealed that operating cash flow negatively affects profitability but is statistically significantly.

Badaru and Ibrahim (2025) evaluated the effect of liquidity management on the financial performance of listed deposit money banks in Nigeria from 2014 to 2023. This study adopted an ex-post facto research deign, utilizing secondary data extracted from audited annual financial reports of six tier-one Nigerian banks. Data obtained for this study was analyzed using descriptive statistics, correlation analysis, and panel least squares regression. Correlation analysis reveals a positive but weak relationship between debt to assets ratio (DAR) and earnings per share (EPS); CDR exerts weak negative correlation with EPS; DAR has an insignificant positive effect on EPS.

Olu-Akinola, Adenle, Oladeji and Adebisi (2025) analyzed the effect of liquidity risk management on the profitability of quoted banks in Nigeria. This study adopted the ex-post facto research design. The study covered the period from 2011 to 2020. Ten banks out of a population of thirteen were purposively selected for this study. Data used for this study was sourced and obtained from the annual reports of the ten selected banks. Analysis of data was carried out using the regression technique; and the result revealed that loan-to-total-deposit ratio (LTDR) and capital adequacy ratio (CAR) have significant positive effect on return on assets (ROA).

Adam and Ayagi (2024) examined the relationship between liquidity and the profitability of listed deposit money banks in Nigeria. This study has a target population of 13 quoted deposit money banks in Nigeria; and a sample of 9 banks was selected using the judgmental sampling technique. This study covered the period from 2013 to 2022; and the ordinary least square (OLS) estimation technique employed for data analysis. The study findings showed that there is a significant relationship between liquidity and profitability. It further revealed that cash ratio has a significant negative effect on profitability (ROE); current ratio has a significant positive effect on profitability (ROE).

Oladokun, Olowolaju, Egbetunde and Abayomi (2024) investigated the effect of liquidity risk management on the financial performance of deposit money banks in Nigeria. Ex-post facto research design was adopted for this study. This study covered the period from 2005 to 2023. Data for this study was obtained from the published annual reports of selected banks; and the panel vector error correction model (PVECM) technique of analysis was adopted for data analysis. The results of analyses revealed that liquidity risk management (liquid asset to total asset ratio) has significant short run positive effect on financial performance (return on asset); loan to deposits ratio has a significant long run negative effect on return on assets.

Uruakpa (2024) studied liquidity management and the profitability of deposit money banks in Nigeria. This study adopted the ex-post facto research design. Data used for this study was obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin and Nigeria Deposit Insurance Corporations (NDIC) over the period 1995-2021. The collected data were analyzed using descriptive statistics and multiple regression analysis. The findings revealed that cash management and shareholders' capital have significant relationship with banks' return on assets. It further revealed that there is a significant relationship between loan to deposit ratio and return on assets.

Alagbe, Yinus and Oladejo (2024) studied the impact of liquidity management on the profitability of Nigeria listed deposit money banks. Ex-post facto research design was adopted for this study as it made use of secondary data obtained from the annual reports of selected deposit money banks in Nigeria for the period 2018-2022. The collected data were analyzed using descriptive and inferential statistics which included correlation analysis and multiple regression analysis. The results of analysis revealed that there is a significant positive relationship between liquidity management and profitability of deposit money banks. It further revealed that liquidity has an insignificant negative effect on return on assets (ROA); and capital adequacy has an insignificant negative effect on return on assets (ROA).

Igwenwanne, Ozurumba, Nwaimo, Anyanwu and Ubah (2023) carried out an evaluation of the effect of liquidity management on deposit money banks' performance in Nigeria for the period of ten (10) years (2012-2021). This study adopted a panel research design as the population of the study comprised of banks in Nigeria that have operated for at least ten (10) years. A sample of twelve (12) banks was selected for the study, and the findings of this study indicated that liquidity management and efficiency ratio have significant positive relationship with the performance of deposit money banks in Nigeria the fixed panel least square technique was adopted as the main estimation technique. It also revealed that cash ratio has an insignificant negative relationship with the performance of deposit money banks in Nigeria.

Bashiru, Eniola and Lateef (2022) investigated the effect of liquidity management on financial performance of listed deposit money banks in Nigeria. The study adopted the ex-post facto research design as it made use of secondary data covering the period from 2010-2019. Panel multiple regression technique was adopted as the technique of data analysis while STATA 13 was used as the tool for analysis. The results of the analysis showed that capital adequacy ratio have positive and significant effect on financial performance of listed deposit money banks in Nigeria. It also showed that liquidity ratio has significant but negative effect on financial performance of banks in Nigeria.

Adesina and Adewumi (2022) studied the effect of liquidity management on the financial performance of selected deposit money banks in Nigeria. The ex-post facto research design was adopted for this study as secondary data for the study was sourced from a sample of five deliberately chosen listed DMBs in Nigeria. For analysis, descriptive statistics, correlation analysis and multiple regression analysis techniques were applied. The findings show that liquidity management, measured as the ratio of liquid assets to total assets has a positive but insignificant impact on return on capital employed. There is a positive but insignificant effect of liquid asset to total deposit on capital employed and deposit form other banks to total assets has positive but insignificant effect on return on capital employed.

El-Maude, Aliyu, Zephaniah and Abu-Saeed (2022) evaluated the influence of liquidity management on the profitability of quoted deposit money banks in Nigeria. Using ex-post facto research design to define the structure and the strategy of the study, the required data were obtained from the financial statements of the banks for the period of ten years (2011-2020). The data obtained were analyzed using both descriptive and inferential statistics. The result of the analyses revealed a positive and significant relationship between liquidity ratio and return on assets, while loan to deposit ratio was found to have a positive but insignificant effect on return on assets.

Egbuhuzor and Ugo (2021) examined the effect of liquidity level on financial performance of listed deposit money banks in Nigeria. The ex-post facto research design was adopted for the study with a population of thirteen (13) listed deposit money banks in Nigeria being selected. The data retrieved from the annual reports of the deposit money banks were analyzed with the aid of multiple regression technique. The findings revealed a negative and insignificant effect of current ratio on return on assets, and a negative and insignificant effect of net working capital ratio on net profit margin.

Okere, Okeke, Echeonwu, Emili and Rufai (2021) assessed the impact of liquidity management on the financial performance of quoted deposit money banks in Nigeria. Secondary data were gathered from the corporate annual reports and accounts of fifteen (15) banks for eleven (11) years spanning from 2007 to 2017. Ordinary least square (OLS) regression was adopted as the statistical technique for data analysis. The results indicate that there exists a significant association amid liquidity management and financial performance of DMBs.

Ighoroje and Akpokerere (2021) wrote on liquidity management and the performance of deposit money banks in Nigeria from the period 1980-2017. Ex-post facto research design was adopted in this study; while, data analysis was carried out with the aid of Autoregressive Distributed Lag (ARDL). The study revealed that there is a long run relationship between banks' performance and the selected key variables; although

liquidity risk (LQR) was found to be the only significant variable.

Gbenga, Idera, Abass and Adeadebayo (2020) examined the impact of liquidity risk management on financial performance of selected deposit money banks in Nigeria for the period 2011-2017. Using ex-post facto research design, annual time series data was obtained from the annual reports and accounts of 10 DMBs. Panel data regression was used for data analysis. From the findings, funding risk has a negative and significant relationship with return on asset. It also showed that financing cost has an insignificant positive relationship with return on assets.

Eze and Agu (2020) carried out a study on liquidity management and performance of deposit money banks in Nigeria. Ex-post facto research design was adopted for this study as secondary data were extracted from annual reports of the banks' websites for a period spanning seven years (2013-2019). Descriptive statistics and regression analysis were performed using the E-Views 10 as instrument for the analysis. Findings indicated a strong positive relationship between capital adequacy and return on equity while liquidity and current ratio showed statistical insignificant negative relationship with return on equity.

Oganda, Mogwambo and Otieno (2020) carried out a study on liquidity risk management on financial performance of commercial banks in Kenya. Correlational research design with a comparative analysis approach was adopted. The target population was two commercial banks and document analysis guide was used to gather quantitative data from the bank's financial statements through 2007 to 2016. Data analysis was conducted using both descriptive and inferential statistics. The study found that deposits had a negative and significant effect on performance of both banks while asset base had a positive relationship.

Alalade, Ogbebor and Akwe (2020) investigated liquidity risk and profitability of listed deposit money banks in Nigeria. The study adopted the ex-post facto research design as it made use of secondary data covering a period of ten years (2009-2018). Data gathered for the study was analyzed with the aid of panel regression technique. The findings revealed that liquidity risk had significant effect on profitability. It also established that liquidity risk indicators had positive and significant effects on individual profitability variables.

Otekunrin, Fagboro, Nwanji, Asamu, Ajiboye and Falaye (2019) examined the performance of selected quoted deposit banks of Nigeria and liquidity management. The descriptive research design was employed in this study. Secondary data used was extracted from the financial statements of 15 deposit money banks out of a population of 17 deposit money banks on the Nigerian Stock Exchange (NSE) for 2012-2017. The data collected was analyzed using ordinary least square technique. The results of the study showed that capital ratio,

current ratio and cash ratio have a positive relationship with return on assets.

Abdullahi, Opusunju and Aku (2019) studied the effect of liquidity on the performance of deposit money banks in Nigeria. The study used ex-post facto research design. The population of this study is 20 DMBs in Nigeria quoted by the Nigerian Stock Exchange as at 2018. Data for the study were gathered from these 20 DMBs for the period from 2000-2018. The study used statistical tools of correlation and regression with the aid of E-View 9.00 for data analysis. The study found that there is significant relationship between liquidity and performance of deposit money banks in Nigeria.

Onyekwelu, Chukwuani and Onyeaka (2018) appraised the effect of liquidity on financial performance of deposit money banks in Nigeria. A sample of five (5) banks was used for the study. Secondary data were collected from the firms for ten years period (2007-2016). The data were analyzed using multiple regression analysis. Results show that liquidity has positive and significant effect on banks' profitability ratios and that liquidity also has positive and significant effect on return on capital employed.

Obi-Nwosu, Okaro, Ogbonna and Atsanan (2017) wrote on the effect of liquidity on performance of deposit money banks in Nigeria. Ex-post facto research design was adopted in this study as secondary data from the period of 2000 to 2015 were collected from the published annual statement of accounts of deposit money banks in Nigeria. The study employed Augmented Dickey Fuller Unit Root Test, OLS regression and Granger Causality as the data analysis techniques. The result of the study revealed that liquidity mechanism is not significantly related to DMBs performance in the short run and long run.

Gap in Literature

The empirical evidence reviewed reveals a persistent lack of consensus on the direction and significance of the liquidity-profitability relationship among Nigerian deposit money banks. While studies such as Onyekwelu et al. (2018), Alalade et al. (2020), Okere et al. (2021), Adam and Ayagi (2024), and Alagbe et al. (2024) report significant positive relationships, others including Onyebuenyi and Ikpeoha-Felix (2026), Bashiru et al. (2022), and Oladokun et al. (2024) find significant negative effects, and yet others (Egbuhuzor&Ugo, 2021; Adesina & Adewumi, 2022; Obi-Nwosu et al., 2017) report insignificant relationships. This inconsistency extends to specific liquidity proxies: loan-to-deposit ratio, for instance, is found to have a significant positive effect in Olu-Akinola et al. (2025) and Uruakpa (2024), an insignificant positive effect in Onyebuenyi and Ikpeoha-Felix (2026) and El-Maude et al. (2022), and a significant negative effect in Oladokun et al. (2024) – demonstrating that even the same variable yields contradictory results across studies.

This divergence appears attributable to differences in liquidity proxies employed, profitability measures adopted (ROA, ROE,

EPS, capital employed), study periods, sample sizes, and estimation techniques (OLS, FMOLS, EGLS, PVECM, ARDL), none of which has emerged as a dominant or consistently applied approach. Furthermore, most reviewed studies concentrate on periods ending before or around 2023, with relatively few incorporating the most recent data reflecting current regulatory reforms, including the CBN's 2024 recapitalization directive. Consequently, there remains no settled empirical position on how liquidity management influences the profitability of listed deposit money banks in Nigeria, and a gap persists for updated, methodologically robust panel evidence that captures recent developments in the sector. This study seeks to fill this gap.

Methodology

The ex-post facto research design is adopted for this study because it examines the effects of liquidity management on profitability using existing financial data without manipulating the variables. The population for this study is comprised of all listed deposit money banks in Nigeria. Secondary data covering 2011–2025 are obtained from the published annual reports and accounts of five selected banks. For this study, liquidity management is measured using loan to deposit ratio (LDR), loan to asset ratio (LAR), and cash ratio (CR), while profitability is measured using profit after tax (PAT) and earnings per share (EPS). Data analysis is carried out using descriptive statistics and inferential statistics which include correlation analysis and panel regression techniques.

Model Specification

Two regression models are specified with profit after tax (PAT) and earnings per share (EPS) serving as the dependent variables while loan to deposit ratio (LDR), loan to asset ratio (LAR), and cash ratio (CR) are the explanatory variables.

The models are specified as follows:

$PAT = \beta_0 + \beta_1 LDR + \beta_2 LAR + \beta_3 CR + \mu$ - - - - (1)

$EPS = \beta_0 + \beta_1 LDR + \beta_2 LAR + \beta_3 CR + \mu$ - - - - - (2)

Where: PAT = profit after tax;

EPS = earnings per share;

LDR = loan to deposit ratio (measured as total loans & advances divided by total deposits);

LAR = loan to asset ratio (measured as total loans & advances divided by total assets);

CR = cash ratio(measured as cash and cash equivalents divided by total deposits);

β_0 = intercept;

$\beta_1 - \beta_3$ = regression coefficients of the explanatory variables; and

μ = error term.

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Results

Descriptive Statistics

Date: 09/24/26
Time: 23:16
Sample: 2011 2025

	LDR	LAR	CR	PAT	EPS
Mean	2.966243	3.193066	1.967191	10.97187	5.299716
Median	3.942746	3.632045	2.714695	10.84613	5.159055
Maximum	4.596735	4.020698	3.700314	13.74954	7.999343
Minimum	-3.912020	-1.309330	-3.912020	8.271548	2.639057
Std. Dev.	2.409077	1.172962	1.956852	1.285243	1.309562
Skewness	-1.709137	-2.116079	-1.647587	0.176070	0.107845
Kurtosis	4.142015	6.725839	4.189480	2.529786	2.274663
Jarque-Bera	39.50759	96.70382	37.33046	1.049688	1.741768
Probability	0.000000	0.000000	0.000000	0.591648	0.418581
Sum	216.5357	233.0938	143.6049	800.9463	386.8793
Sum Sq. Dev.	417.8630	99.06053	275.7074	118.9331	123.4767
Observations	73	73	73	73	73

Source: E-views 10 Output (2026)

The descriptive statistics show that the mean values of LDR, LAR and CR are 2.97, 3.19 and 1.97 respectively, while PAT and EPS have mean values of 10.97 and 5.30. The median values of LDR (3.94), LAR (3.63) and CR (2.71) are higher than their respective means, whereas the median values of PAT (10.85) and EPS (5.16) are slightly lower than their means. LDR records the highest value of 4.60 and the lowest value of -3.91, while LAR ranges from -1.31 to 4.02 and CR from -3.91 to 3.70. PAT has a maximum of 13.75 and minimum of 8.27, whereas EPS records a maximum of 8.00 and minimum of 2.64. The standard deviations of LDR (2.41), LAR (1.17), CR (1.96), PAT (1.29) and EPS (1.31) indicate varying degrees of dispersion around their respective means, with LDR exhibiting the greatest variability. The negative skewness values for LDR (-1.71), LAR (-2.12) and CR (-1.65) indicate left-skewed distributions, while PAT (0.18) and EPS (0.11) are slightly right-skewed. The Jarque-Bera probabilities for LDR, LAR and CR are 0.0000, indicating significant departures from normality, whereas the probabilities for PAT (0.592) and EPS (0.419) exceed 0.05 which suggest that their distributions do not significantly depart from normality.

Correlation Matrix

	LDR	LAR	CR	PAT	EPS
LDR	1.000000	0.963086	0.968784	0.320782	0.405415
LAR	0.963086	1.000000	0.926063	0.248118	0.338156
CR	0.968784	0.926063	1.000000	0.364410	0.411604
PAT	0.320782	0.248118	0.364410	1.000000	0.914644
EPS	0.405415	0.338156	0.411604	0.914644	1.000000

Source: E-views 10 Output (2026)

The correlation matrix indicates that LDR, LAR and CR have strong positive relationships with one another, with correlation coefficients of 0.963, 0.926 and 0.969 respectively and this suggest that there is a high degree of association among the variables. LDR has a positive relationship with PAT (0.321) and EPS (0.405), while LAR also has positive but relatively weaker relationships with PAT (0.248) and EPS (0.338). Similarly, CR exhibits positive relationships with PAT (0.364) and EPS (0.412), indicating that higher values of the liquidity measures are associated with higher profitability measures at the bivariate level. PAT and EPS have a very strong positive correlation of 0.915, suggesting that banks with higher profit after tax generally tend to record higher earnings per share. The overall correlation coefficients between the explanatory variables and the dependent variables are positive and moderate, while the very high correlations among LDR, LAR and CR suggest that appropriate multicollinearity diagnostics should be conducted before estimating the panel regression models.

Variance Inflation Factor (VIF)

Variable	R^2	VIF = 1/(1-R^2)	Decision
LDR	0.191289	1.24	Accept
LAR	0.193272	1.24	Accept
CR	0.075318	1.08	Accept

Source: Researcher's Computation (2026)

The results of the Variance Inflation Factor (VIF) indicate that LDR, LAR and CR have VIF values of 1.24, 1.24 and 1.08 respectively. Since all the VIF values are substantially below the commonly applied threshold of 10, the explanatory variables do not exhibit problematic multicollinearity. This implies that the high pairwise correlations observed among LDR, LAR and CR do not translate into serious multicollinearity concerns within the regression specification. Hence, all three liquidity management variables are accepted for inclusion in the panel regression models as their individual effects can be estimated without substantial distortion arising from multicollinearity.

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Panel Unit Root Test

Variables	Levin-Lin-chu t*		Im-Pesaran-Shin W-stat		ADF		Order of Integration
	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.	
LDR	-2.21581	0.0134	-2.22543	0.0130	21.9898	0.0152	I(1)
LAR	-2.14013	0.0162	-2.25755	0.0120	21.4356	0.0183	I(1)
CR	-5.58807	0.0000	-1.91227	0.0279	21.5294	0.0177	I(0)
PAT	-0.40694	0.3420	-2.00403	0.0225	20.3092	0.0265	I(1)
EPS	-1.98004	0.0238	-3.06202	0.0011	27.2114	0.0024	I(0)

Source: E-views 10 Output (See Appendix)

Output from panel unit root test show that the variables exhibit mixed orders of integration, as LDR, LAR, and PAT are integrated of order one I (1), while CR and EPS are stationary at level I(0). The Levin-Lin-Chu, Im-Pesaran-Shin and ADF tests generally show probability values below 0.05 for LDR and LAR, indicating rejection of the null hypothesis of a unit root and confirming stationarity after first differencing. CR and EPS are stationary at level, as their reported probability values are below 0.05 across the relevant tests. Although the Levin-Lin-Chu test for PAT has a probability value of 0.3420, the Im-Pesaran-Shin and ADF tests show probability values of 0.0225 and 0.0265 respectively after first differencing.

Pooled Ordinary Least Squares (POLS) Output

	MODEL ONE (PAT)			MODEL TWO (EPS)		
	LDR	LAR	CR	LDR	LAR	CR
Coefficient	0.157176	-0.836938	0.516462	0.467007	-0.781300	0.152163
R-squared		0.191540			0.205241	

Source: E-Views Output (See Appendix)

The results above show that for Model One, LDR and CR have positive coefficients of 0.1572 and 0.5165, respectively, indicating that increases in these variables are associated with increases in PAT, while LAR has a negative coefficient of -0.8369 which suggests that there is an inverse relationship with PAT. In Model Two, LDR and CR also have positive coefficients of 0.4670 and 0.1522 respectively which indicates positive relationships with EPS, whereas LAR has a negative coefficient of -0.7813 which implies an inverse relationship with EPS. The R-squared values of 0.1915 for Model One and 0.2052 for Model Two indicate that the liquidity variables jointly explain approximately 19.15% of the variations in PAT and 20.52% of the variations in EPS respectively, while the remaining variations are attributable to other factors not included in the models.

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Hausman Specification Test

	Model One (PAT)		Model Two (EPS)	
	Chi-Sq. Statistic	Prob.	Chi-Sq. Statistic	Prob.
Cross-section random	4.636089	0.2005	4.217898	0.2389

Source: E-Views Output (See Appendix)

The Hausman specification test results indicate that the chi-square statistic for Model One (PAT) is 4.6361 with a probability value of 0.2005, while Model Two (EPS) records a chi-square statistic of 4.2179 with a probability value of 0.2389. Since the probability values for both models are greater than the 5% significance level, the null hypothesis that the random-effects estimator is appropriate is not rejected. This implies that the random-effects model is considered more appropriate than the fixed-effects model for estimating both models.

Cross-Section Dependence Test

	Model One (PAT)		Model Two (EPS)	
	Statistic	Prob.	Statistic	Prob.
Pesaran CD	8.515922	0.0000	8.552907	0.0000

Source: E-views 10 Output (See Appendix)

The Pesaran Cross-Section Dependence test indicates the presence of significant cross-sectional dependence in both models. For Model One (PAT), the Pesaran CD statistic is 8.5159 with a probability value of 0.0000, while Model Two (EPS) records a statistic of 8.5529 with a probability value of 0.0000. Since the probability values for both models are less than the 5% significance level, the null hypothesis of no cross-sectional dependence is rejected. This indicates that the listed deposit money banks are not cross-sectionally independent, and this suggests that shocks affecting one bank may affect other banks.

Random Effects Output

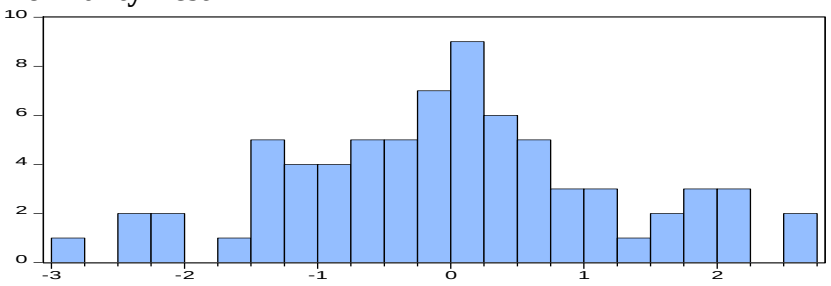
	MODEL ONE (PAT)			MODEL TWO (EPS)		
	LDR	LAR	CR	LDR	LAR	CR
Coefficient	0.168605	-0.623326	0.218912	0.481416	-0.640882	-0.062102
R-squared		0.046479			0.047369	

Source: E-Views Output (See Appendix)

The random-effects results indicate that in Model One LDR and CR have positive coefficients of 0.1686 and 0.2189 respectively which suggest that increases in these liquidity measures are associated with increases in PAT; while LAR has a negative coefficient of -0.6233 which indicates an inverse relationship with PAT. In Model

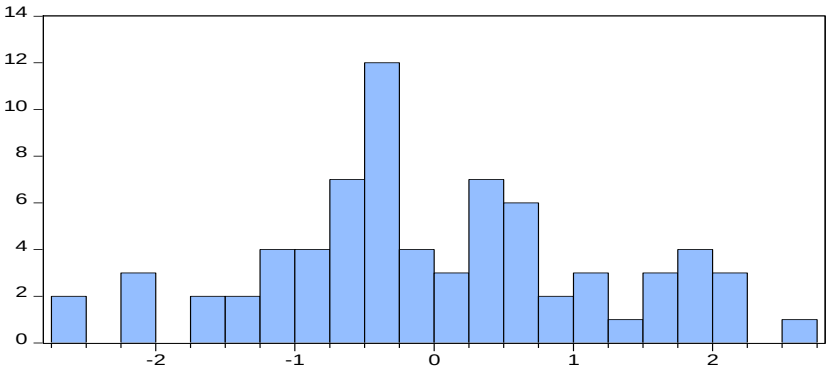
Two, LDR has a positive coefficient of 0.4814 which implies a positive relationship with EPS; while LAR and CR have negative coefficients of -0.6409 and -0.0621 respectively which indicates inverse relationships with EPS. The R-squared values of 0.0465 for Model One and 0.0474 for Model Two show that the liquidity variables explain approximately 4.65% of the variation in PAT and 4.74% of the variation in EPS respectively, with the remaining variations explained by other factors outside the models. However, the statistical significance of this results will be examined under the test of hypotheses.

Normality Test



Series: Standardized Residuals	
Sample 2011 2025	
Observations 73	
Mean	0.006496
Median	0.063626
Maximum	2.641698
Minimum	-2.903111
Std. Dev.	1.204175
Skewness	0.025625
Kurtosis	2.810776
Jarque-Bera	0.116898
Probability	0.943226

The Jarque-Bera normality test for Model One (PAT) reports a statistic of 0.116898 with a probability value of 0.943226. Since the probability value is greater than the 5% significance level, the null hypothesis that the residuals are normally distributed is not rejected. This indicates that the residuals of Model One are approximately normally distributed and this suggests that the normality assumption of the panel regression model is satisfied.



Series: Standardized Residuals	
Sample 2011 2025	
Observations 73	
Mean	0.006262
Median	-0.102936
Maximum	2.562464
Minimum	-2.728582
Std. Dev.	1.192483
Skewness	0.040186
Kurtosis	2.637902
Jarque-Bera	0.418456
Probability	0.811210

The Jarque-Bera normality test for Model Two (EPS) reports a statistic of 0.418456 with a probability value of 0.811210. Since the probability value is greater than the 5% significance level, the null hypothesis that the residuals are normally distributed is not rejected. This indicates that the residuals of Model Two are approximately normally distributed and this confirms that the normality assumption of the panel regression model is satisfied.

Test of Hypotheses

Table of Significance

Hypothesis	P-value	Decision
H_{01}	0.6064	**Accept H_{01}**
H_{02}	0.1193	**Accept H_{02}**
H_{03}	0.4146	**Accept H_{03}**
H_{04}	0.1596	**Accept H_{04}**
H_{05}	0.1319	**Accept H_{05}**
H_{06}	0.8276	**Accept H_{06}**

Source: See Appendix

Hypothesis One: Loan to deposit ratio (LDR) does not have any significant effect on profit after tax (PAT).

The test result produces a p-value of 0.6064, which is greater than the 5% significance level. Therefore, the null hypothesis is accepted and this indicates that LDR does not have a statistically significant effect on PAT.

Hypothesis Two: Loan to asset ratio (LAR) has not significantly affected profit after tax (PAT).

The result shows a p-value of 0.1193, which is greater than the 0.05 significance level. Consequently, the null hypothesis is accepted and this implies that LAR does not have a statistically significant effect on PAT.

Hypothesis Three: Cash ratio (CR) has no significant effect on profit after tax (PAT).

The reported p-value of 0.4146 exceeds the 5% significance level; hence, the null hypothesis is accepted. This indicates that CR does not have a statistically significant effect on PAT.

Hypothesis Four: Loan to deposit ratio (LDR) does not have any significant effect on earnings per share (EPS).

The p-value of 0.1596 is greater than 0.05, this leads to the acceptance of the null hypothesis. Thus, LDR does not have a statistically significant effect on EPS.

Hypothesis Five: Loan to asset ratio (LAR) has not significantly affected earnings per share (EPS).

With a p-value of 0.1319, which is greater than the 5% significance level, the null hypothesis is accepted. This indicates that LAR does not have a statistically significant effect on EPS.

Hypothesis Six: Cash ratio (CR) has no significant effect on earnings per share (EPS).

The result gives a p-value of 0.8276, which exceeds the 5% significance level. Therefore, the null hypothesis is accepted and it indicates that CR does not have a statistically significant effect on EPS.

Discussion of Findings

The first three findings, which indicate that LDR and CR have positive but insignificant effects on PAT while LAR has a negative insignificant effect, are partly consistent with the a-priori expectation that effective liquidity management should enhance banks' profitability by enabling them to meet obligations while efficiently deploying funds. The positive but insignificant effect of LDR on PAT agrees with Onyebuenyi and Ikpeoha-Felix (2026) and El-Maude et al. (2022), who similarly found that LDR had a positive but insignificant effect on bank profitability. However, it differs from Olu-Akinola et al. (2025), Uruakpa (2024), and Onyekwelu et al. (2018), who reported significant positive effects of loan-related liquidity measures on profitability. The positive but insignificant effect of CR on PAT is also contrary to Ali and Urum (2025) who found a significant positive effect of cash ratio on profitability, and Otekunrin et al. (2019) who reported a positive relationship between cash ratio and ROA. Nevertheless, the finding is consistent in direction with the positive liquidity-performance evidence reported by Igwenwanne et al. (2023) and Adesina and Adewumi (2022), although their effects were not uniformly significant. This finding is broadly consistent with Egbuhuzor and Ugo (2021), who found a negative and insignificant effect of current ratio on ROA, and Alagbe et al. (2024), who reported an insignificant negative effect of liquidity on ROA. It also contrasts with the significant positive liquidity-profitability relationship reported by Okere et al. (2021), Alalade et al. (2020), and Onyekwelu et al. (2018).

The findings also show that LDR has a positive insignificant effect on EPS, whereas LAR and CR have negative insignificant effects on EPS. The positive direction of LDR is consistent with Onyebuenyi and Ikpeoha-Felix (2026) who found an insignificant positive effect of LDR on ROA, and with El-Maude et al. (2022) who similarly reported a positive but insignificant LDR effect. However, the negative but insignificant effect of LAR on EPS differs from the positive but insignificant effect of DAR on EPS reported by Badaru and Ibrahim (2025). Similarly, the negative but insignificant effect of CR on EPS contrasts with Ali and Urum (2025) who found a significant positive effect of cash ratio on profitability, and Otekunrin et al. (2019) who reported a positive relationship between cash ratio and ROA. It is, however, consistent with Igwenwanne et al. (2023) and Eze and Agu (2020), who found negative but insignificant relationships involving cash/current liquidity measures and bank performance. The overall insignificance of the three liquidity measures on EPS also supports the evidence of Adesina and Adewumi (2022), Egbuhuzor and Ugo (2021), and Obi-Nwosu et al. (2017) which suggests that liquidity measures do not invariably produce

statistically significant effects on bank performance.

Conclusion

This study conclusively holds that liquidity management which is measured by loan to deposit ratio (LDR), loan to asset ratio (LAR), and cash ratio (CR)exert mixed and statistically insignificant effects on the profitability (PAT and EPS) of listed deposit money banks in Nigeria over the period 2011–2025. Specifically, LDR had a positive insignificant effect on profit after tax (PAT) and earnings per share (EPS), while LAR had a negative but insignificant effect on both PAT and EPS. Similarly, CR had a positive but insignificant effect on PAT but a negative and insignificant effect on EPS. These findings indicate that variations in the liquidity positions of the sampled banks did not translate into significant changes in their profitability during the study period. This study further holds that the profitability of listed deposit money banks in Nigeria may be influenced more substantially by other factors beyond the liquidity measures examined.

Recommendations

In line with the findings recorded, this study recommends that:

1. Based on the positive but insignificant effect of LDR on PAT, bank management should maintain an optimal balance between deposits mobilized and loans granted by ensuring that loan expansion is supported by adequate deposit funding and effective credit-risk assessment.
2. Given the negative but insignificant effect of LAR on PAT, listed deposit money banks should exercise prudence in allocating a large proportion of their assets to loans and advances, ensuring that credit expansion is directed towards productive and adequately assessed investments.
3. In view of the positive but insignificant effect of CR on PAT, banks should maintain sufficient cash and near-cash resources to meet depositors' obligations while avoiding excessive idle liquid funds that could otherwise be deployed into income-generating assets.
4. Based on the positive but insignificant effect of LDR on EPS, bank management should strengthen deposit mobilization and prudent lending strategies so that increased lending activity is adequately supported by stable funding and contributes to shareholders' earnings.
5. Considering the negative but insignificant effect of LAR on EPS, banks should improve the quality and productivity of their loan portfolios by reducing non-performing loans and ensuring that credit is extended to viable and profitable economic activities.
6. Given the negative but insignificant effect of CR on EPS, listed deposit money banks should optimize their cash holdings by maintaining

adequate liquidity buffers without unnecessarily tying up excessive resources in low- or non-income-generating liquid assets.

Contribution to Knowledge

This study contributes to knowledge by providing additional empirical evidence on the liquidity management–profitability nexus among listed deposit money banks in Nigeria, hence addressing the inconsistency identified in the literature regarding the direction and significance of the relationship. While previous studies have reported positive, negative, and insignificant effects depending on the liquidity measure and profitability indicator employed, this study extends the evidence by jointly examining loan to deposit ratio (LDR), loan to asset ratio (LAR), and cash ratio (CR) against both profit after tax (PAT) and earnings per share (EPS) over the 2011–2025 period. The finding that all six liquidity-profitability relationships were statistically insignificant provides further evidence that the effect of liquidity management on bank profitability may not be uniform and may depend on the specific liquidity and profitability measures considered, thus helping to clarify the mixed findings in existing literature.

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Data presented on the tables below include: total deposits (TD), loans and advances (LA), total assets (TA), loan to deposit ratio (LDR), loan to asset ratio (LAR), cash ratio (CR), cash and cash equivalents (CCE), profit after tax (PAT), and earnings per share (EPS).

Data on the Variables ACCESS BANK PLC

YEAR	TD	LA	TA	LDR	LAR	CR	CCE	PAT	EPS
2011	654,416	491,654	949,382	75.13	51.79	15.01	98,256	5,249	172
2012	1,110,292	557,647	1,515,754	50.23	36.79	13.66	151,617	35,816	172
2013	1,278,472	748,350	1,704,094	58.53	43.91	17.49	223,568	26,212	158
2014	1,459,311	1,075,686	1,981,956	73.71	54.27	6.91	100,897	39,941	114
2015	1,591,558	1,303,630	2,411,944	81.91	54.05	10.27	163,406	65,869	174
2016	1,908,165	1,698,569	3,094,961	89.02	54.88	7.74	147,638	61,677	221
2017	2,186,915	1,872,712	3,499,684	85.63	53.51	9.09	198,812	51,335	221
2018	2,675,384	1,782,755	3,968,115	66.64	44.93	15.86	424,361	73,596	177
2019	4,747,624	2,646,037	6,307,588	55.73	41.95	22.75	1,080,005	70,116	207
2020	5,664,376	3,050,664	7,624,980	53.86	40.01	12.44	704,478	80,039	225
2021	6,939,776	3,578,332	9,660,761	51.56	37.04	16.04	1,113,369	111,326	314
2022	9,167,380	4,406,962	12,535,279	48.07	35.16	15.10	1,384,146	166,658	469
2023	15,147,039	6,028,700	20,649,115	39.80	29.20	18.25	2,764,422	535,678	1508
2024	21,245,527	7,478,566	27,681,603	35.20	27.02	23.82	5,060,500	459,375	1,241
2025	16,931,395	5,849,090	26,072,095	34.55	22.43	24.32	4,117,493	446,516	837

Data on the Variables UBAPLC

YEAR	TD	LA	TA	LDR	LAR	CR	CCE	PAT	EPS
2011	1,239,919	594,090	1,666,053	47.91	35.66	22.44	278,254	(7,966)	(0.24)
2012	1,484,006	598,592	1,933,065	40.34	30.97	33.56	498,088	47,375	144
2013	1,797,376	823,193	2,217,417	45.80	37.12	12.44	223,538	46,483	141
2014	1,813,803	933,578	2,338,858	51.47	39.92	18.59	337,200	40,083	122
2015	1,627,410	837,285	2,216,337	51.45	37.78	17.86	290,586	47,642	136
2016	1,729,343	1,114,205	2,539,585	64.43	43.87	13.67	236,416	47,541	131
2017	1,893,026	1,193,188	2,931,826	63.03	40.70	14.43	273,125	42,438	120
2018	2,454,610	1,229,317	3,591,305	50.08	34.23	18.34	450,063	41,047	120
2019	2,857,105	1,603,229	4,136,493	56.11	38.76	12.67	361,927	62,750	183
2020	3,945,958	1,877,594	5,207,833	47.58	36.05	10.98	433,429	56,911	166
2021	4,487,416	1,968,226	5,574,976	43.86	35.30	8.76	393,171	58,669	172
2022	5,910,309	2,354,850	7,361,045	39.84	31.99	13.88	820,436	133,696	391
2023	10,359,154	3,467,920	12,877,774	33.48	26.93	21.22	2,197,898	586,626	1,715
2024	13,477,706	4,211,474	17,291,956	31.25	24.36	21.69	2,923,424	564,695	1,651
2025	12,669,730	3,765,463	16,406,714	29.72	22.95	17.63	2,233,842	165,303	4,27

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Data on the Variables ZENITH BANK PLC

YEAR	TD	LA	TA	LDR	LAR	CR	CCE	PAT	EPS
2011	1,577,290	827,035	2,169,073	52.43	38.13	33.03	520,979	41,301	132
2012	1,802,008	895,354	2,436,886	49.69	36.74	34.04	613,400	95,803	305
2013	2,079,862	1,126,559	2,878,693	54.17	39.13	40.46	841,477	83,414	266
2014	2,265,262	1,580,250	3,423,819	69.76	46.15	38.49	871,853	92,479	295
2015	2,333,017	1,849,225	3,750,327	79.26	49.31	28.43	663,375	98,784	315
2016	2,552,963	2,138,132	4,283,736	83.75	49.91	22.18	566,358	119,285	380
2017	2,744,525	1,980,464	4,833,658	72.16	40.97	19.44	533,511	153,003	487
2018	2,821,066	1,736,066	4,955,445	61.54	35.03	21.66	610,915	165,480	527
2019	3,486,887	2,239,472	5,435,073	64.23	41.20	11.15	388,853	178,003	567
2020	4,298,258	2,639,797	7,124,987	61.42	37.05	20.54	882,683	197,852	630
2021	5,169,199	3,099,452	7,872,292	59.96	39.37	15.02	776,574	233,133	743
2022	7,434,806	3,735,676	10,570,678	50.25	35.34	22.29	1,657,186	234,593	747
2023	12,154,824	5,928,796	16,811,093	48.78	35.27	16.61	2,018,402	595,601	1,897
2024	17,163,424	8,708,775	24,038,319	50.74	36.23	20.25	3,475,870	936,159	2,979
2025	18,114,919	8,167,344	23,602,421	45.09	34.60	12.36	2,239,000	813,083	1,980

Data on the Variables FIDELITY BANK PLC

YEAR	TD	LA	TA	LDR	LAR	CR	CCE	PAT	EPS
2011	564,390	280,421	737,732	49.69	38.01	32.01	180,682	3,911	14
2012	716,749	345,500	914,360	48.20	37.79	30.04	215,292	17,924	62
2013	806,320	426,076	1,081,217	52.84	39.41	17.28	139,350	7,721	27
2014	820,034	541,686	1,187,025	66.06	45.63	15.46	126,743	16,142	48
2015	769,636	578,203	1,231,722	75.13	46.94	14.83	114,135	16,315	48
2016	792,971	718,401	1,298,141	90.60	55.34	10.85	86,015	5,457	19
2017	775,276	768,737	1,379,214	99.16	55.74	18.17	140,895	17,768	31
2018	979,413	849,880	1,719,883	86.77	49.41	25.21	246,950	22,926	79
2019	1,225,213	1,126,974	2,114,037	91.98	53.31	21.21	259,915	28,425	98
2020	1,699,026	1,326,106	2,758,148	78.05	48.08	19.33	328,493	26,650	92
2021	2,024,803	1,658,412	3,280,453	81.90	50.55	10.83	219,253	23,104	985
2022	2,580,597	2,116,212	3,989,009	82.00	53.05	11.64	300,345	46,724	1,086
2023	3,926,842	2,962,397	6,123,152	75.44	48.38	9.59	376,595	99,532	1,347
2024	5,660,315	4,346,049	8,545,237	76.78	50.86	8.93	505,331	226,598	1,710
2025	6,461,185	4,190,409	10,121,189	64.86	41.40	16.83	1,087,448	368,295	1,620

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Data on the Variables FIRST BANK PLC

YEAR	TD	LA	TA	LDR	LAR	CR	CCE	PAT	EPS
2011	1,783,777	1,128,851	2,463,543	63.28	45.82	39.75	708,992	18,636	57
2012	2,484,578	NA	270,977	NA	NA	25.82	641,573	76,800	237
2013	3,011,113	1,549	311,811	0.05	0.50	0.05	1,476	70,631	216
2014	3,222,004	3,341	287,770	0.10	1.16	0.15	4,727	84,011	235
2015	3,115,574	4,855	282,831	0.16	1.72	0.15	4,792	15,148	43
2016	3,520,299	710	266,903	0.02	0.27	0.02	645	7,507	21
2017	3,808,704	7,693	269,621	0.20	2.85	0.20	7,585	9,275	26
2018	4,236,006	16,749	269,621	0.40	6.21	0.39	16,639	9,342	26
2019	4,880,322	5,800	270,324	0.12	2.15	0.12	5,706	13,862	39
2020	5,933,935	11,301	300,623	0.19	3.76	0.19	11,240	33,860	94
2021	6,947,594	16,526	298,485	0.24	5.54	0.24	16,477	13,048	36
2022	8,179,340	18,370	306,355	0.22	6.00	0.22	18,331	19,460	54
2023	12,466,528	16,792	305,535	0.13	5.50	0.13	16,523	15,170	42
2024	20,093,122	23,447	326,822	0.12	7.17	0.12	23,269	26,224	73
2025	20,902,012	12,048	560,019	0.06	2.15	0.06	11,961	43,028	103

CR IS STATIONARY AT LEVEL

Panel unit root test: Summary
Series: CR
Date: 09/24/26 Time: 23:59
Sample: 2011 2025
Exogenous variables: Individual effects, individual linear trends
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.58807	0.0000	5	65
Breitung t-stat	0.12681	0.5505	5	60
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.91227	0.0279	5	65
ADF - Fisher Chi-square	21.5294	0.0177	5	65
PP - Fisher Chi-square	22.1469	0.0144	5	70

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

EPS IS STATIONARY AT ORDER ONE

Panel unit root test: Summary
Series: D(EPS)

Date: 09/24/26 Time: 23:58
Sample: 2011 2025
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-1.98004	0.0238	5	59
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.06202	0.0011	5	59
ADF - Fisher Chi-square	27.2114	0.0024	5	59
PP - Fisher Chi-square	36.0784	0.0001	5	64

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

LAR IS STATIONARY AT ORDER ONE

Panel unit root test: Summary
Series: D(LAR)
Date: 09/25/26 Time: 00:00
Sample: 2011 2025
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.14013	0.0162	5	58
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.25755	0.0120	5	58
ADF - Fisher Chi-square	21.4356	0.0183	5	58
PP - Fisher Chi-square	46.8602	0.0000	5	63

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

LDR IS STATIONARY AT ORDER ONE

Panel unit root test: Summary
Series: D(LDR)
Date: 09/25/26 Time: 00:00

Sample: 2011 2025
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.21581	0.0134	5	58
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.22543	0.0130	5	58
ADF - Fisher Chi-square	21.9898	0.0152	5	58
PP - Fisher Chi-square	37.6395	0.0000	5	63

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

PAT IS STATIONARY AT ORDER ONE

Panel unit root test: Summary
Series: D(PAT)
Date: 09/25/26 Time: 00:01
Sample: 2011 2025
Exogenous variables: Individual effects, individual linear trends
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-0.40694	0.3420	5	59
Breitung t-stat	-0.34963	0.3633	5	54
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.00403	0.0225	5	59
ADF - Fisher Chi-square	20.3092	0.0265	5	59
PP - Fisher Chi-square	73.5365	0.0000	5	64

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

CROSS-SECTION DEPENDENCE TEST OUTPUT FOR MODEL ONE

Residual Cross-Section Dependence Test
Null hypothesis: No cross-section dependence (correlation) in residuals
Equation: Untitled

Periods included: 15
Cross-sections included: 5
Total panel (unbalanced) observations: 73
Note: non-zero cross-section means detected in data
Test employs centered correlations computed from pairwise samples

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	80.50693	10	0.0000
Pesaran scaled LM	15.76583		0.0000
Pesaran CD	8.515922		0.0000

CROSS-SECTION DEPENDENCE TEST OUTPUT FOR MODEL TWO

Residual Cross-Section Dependence Test
Null hypothesis: No cross-section dependence (correlation) in residuals
Equation: Untitled
Periods included: 15
Cross-sections included: 5
Total panel (unbalanced) observations: 73
Note: non-zero cross-section means detected in data
Test employs centered correlations computed from pairwise samples

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	80.44147	10	0.0000
Pesaran scaled LM	15.75119		0.0000
Pesaran CD	8.552907		0.0000

HAUSMAN SPECIFICATION OUTPUT FOR MODEL ONE

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	4.636089	3	0.2005

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LDR	-0.086304	0.168605	0.032767	0.1591
LAR	-0.438718	-0.623326	0.011024	0.0787
CR	0.195603	0.218912	0.001733	0.5756

Cross-section random effects test equation:
Dependent Variable: PAT
Method: Panel Least Squares
Date: 09/24/26 Time: 23:27
Sample: 2011 2025
Periods included: 15
Cross-sections included: 5
Total panel (unbalanced) observations: 73

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12.24393	0.752276	16.27584	0.0000
LDR	-0.086304	0.372638	-0.231603	0.8176
LAR	-0.438718	0.408858	-1.073033	0.2872
CR	0.195603	0.269952	0.724585	0.4713

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.426476	Mean dependent var	10.97187
Adjusted R-squared	0.364711	S.D. dependent var	1.285243
S.E. of regression	1.024403	Akaike info criterion	2.989202
Sum squared resid	68.21106	Schwarz criterion	3.240212
Log likelihood	-101.1059	Hannan-Quinn criter.	3.089234
F-statistic	6.904903	Durbin-Watson stat	0.425428
Prob(F-statistic)	0.000004		

HAUSMAN SPECIFICATION OUTPUT FOR MODEL TWO

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	4.217898	3	0.2389

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.

LDR	0.185511	0.481416	0.044600	0.1612
LAR	-0.428798	-0.640882	0.015001	0.0833
CR	-0.089214	-0.062102	0.002846	0.6113

Cross-section random effects test equation:
Dependent Variable: EPS
Method: Panel Least Squares
Date: 09/24/26 Time: 23:37
Sample: 2011 2025
Periods included: 15
Cross-sections included: 5
Total panel (unbalanced) observations: 73

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.294127	0.805580	7.813163	0.0000
LDR	0.185511	0.399041	0.464892	0.6436
LAR	-0.428798	0.437828	-0.979376	0.3310
CR	-0.089214	0.289079	-0.308613	0.7586

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.366521	Mean dependent var	5.299716
Adjusted R-squared	0.298300	S.D. dependent var	1.309562
S.E. of regression	1.096988	Akaike info criterion	3.126119
Sum squared resid	78.21987	Schwarz criterion	3.377129
Log likelihood	-106.1034	Hannan-Quinn criter.	3.226151
F-statistic	5.372569	Durbin-Watson stat	0.390015
Prob(F-statistic)	0.000069		

PANEL LEAST SQUARES OUTPUT FOR MODEL ONE
Dependent Variable: PAT
Method: Panel Least Squares
Date: 09/25/26 Time: 14:09
Sample: 2011 2025
Periods included: 15
Cross-sections included: 5
Total panel (unbalanced) observations: 73

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12.16206	0.824259	14.75514	0.0000
LDR	0.157176	0.328342	0.478696	0.6337
LAR	-0.836938	0.443013	-1.889195	0.0631

CR	0.516462	0.288349	1.791101	0.0777

R-squared	0.191540	Mean dependent var	10.97187
Adjusted R-squared	0.156389	S.D. dependent var	1.285243
S.E. of regression	1.180474	Akaike info criterion	3.222945
Sum squared resid	96.15273	Schwarz criterion	3.348449
Log likelihood	-113.6375	Hannan-Quinn criter.	3.272960
F-statistic	5.449135	Durbin-Watson stat	0.291427
Prob(F-statistic)	0.002020		

PANEL LEAST SQUARES OUTPUT FOR MODEL TWO

Dependent Variable: EPS
Method: Panel Least Squares
Date: 09/25/26 Time: 14:10
Sample: 2011 2025
Periods included: 15
Cross-sections included: 5
Total panel (unbalanced) observations: 73

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.109867	0.832709	7.337338	0.0000
LDR	0.467007	0.331708	1.407887	0.1637
LAR	-0.781300	0.447554	-1.745710	0.0853
CR	0.152163	0.291305	0.522351	0.6031

R-squared	0.205241	Mean dependent var	5.299716
Adjusted R-squared	0.170687	S.D. dependent var	1.309562
S.E. of regression	1.192575	Akaike info criterion	3.243342
Sum squared resid	98.13415	Schwarz criterion	3.368847
Log likelihood	-114.3820	Hannan-Quinn criter.	3.293358
F-statistic	5.939603	Durbin-Watson stat	0.292075
Prob(F-statistic)	0.001154		

RANDOM EFFECTS MODEL (PAT)

Dependent Variable: PAT
Method: Panel EGLS (Cross-section random effects)
Date: 09/24/26 Time: 23:24
Sample: 2011 2025
Periods included: 15
Cross-sections included: 5
Total panel (unbalanced) observations: 73
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.

C	12.02493	0.796375	15.09959	0.0000
LDR	0.168605	0.325717	0.517642	0.6064
LAR	-0.623326	0.395147	-1.577454	0.1193
CR	0.218912	0.266722	0.820749	0.4146

Effects Specification		
	S.D.	Rho
Cross-section random	0.700533	0.3186
Idiosyncratic random	1.024403	0.6814

Weighted Statistics

R-squared	0.046479	Mean dependent var	3.919473
Adjusted R-squared	0.005021	S.D. dependent var	1.035004
S.E. of regression	1.036477	Sum squared resid	74.12557
F-statistic	1.121122	Durbin-Watson stat	0.382496
Prob(F-statistic)	0.346597		

Unweighted Statistics

R-squared	0.122147	Mean dependent var	10.97187
Sum squared resid	104.4059	Durbin-Watson stat	0.271563

RANDOM EFFECTS MODEL (EPS)

Dependent Variable: EPS
Method: Panel EGLS (Cross-section random effects)
Date: 09/24/26 Time: 23:37
Sample: 2011 2025
Periods included: 15
Cross-sections included: 5
Total panel (unbalanced) observations: 73
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.034003	0.823406	7.328101	0.0000
LDR	0.481416	0.338577	1.421880	0.1596
LAR	-0.640882	0.420348	-1.524648	0.1319
CR	-0.062102	0.284115	-0.218580	0.8276

Effects Specification		
	S.D.	Rho
Cross-section random	0.588041	0.2232
Idiosyncratic random	1.096988	0.7768

Weighted Statistics			
R-squared	0.047369	Mean dependent var	2.322139
Adjusted R-squared	0.005950	S.D. dependent var	1.104898
S.E. of regression	1.106627	Sum squared resid	84.49900
F-statistic	1.143666	Durbin-Watson stat	0.350790
Prob(F-statistic)	0.337687		
Unweighted Statistics			
R-squared	0.170791	Mean dependent var	5.299716
Sum squared resid	102.3879	Durbin-Watson stat	0.289501