Optimal Liquidity Management and Financial Sector Performance in Nigeria

2010 – 2022

Dr Emmanuel Chika Obizue
Department of Banking and Finance
Imo State University, Owerri
+2348068099918, +2347031976469
dremmanuelobizue@gmail.com

Justin Unimke Aniah
Department of Business Administration, Veritas University, Bwari, Abuja
08167129092 unimkeatia@gmail.com

Margaret -Theresa Aniah
Department of Business Administration, Veritas University, Bwari, Abuja
08130476096 mjayunimke@gmail.com

and

Elizabeth Akpana Egharevba
Department of Business Education, Veritas University, Bwari, Abuja
+2348023070030 begharevba@gmail.com

Abstract

Optimal Liquidity management is critical for maintaining financial stability and promoting credit availability in the financial sector thereby supporting economic growth and development of any nation. This study is a cross-sectional quasi experimental research design and it examined the effect of optimising liquidity management on financial sector performance in Nigeria. Secondary data were sourced from annual published financial reports of the deposit money banks that were selected for the purpose of this study. Return on equity (ROE) was used as proxy for the dependent variable, financial performance while deposit-to-asset ratio (DAR), cash-to-deposit ratio (CDR) and Loan-to-deposit ratio (LDR) were used to measure liquidity management which is the independent variable. Panel data ordinary least square was used to estimate the relationship between the residuals. The study results revealed that 84 percent variations in ROE of the banks were accounted for by the independent variables. Also DAR and CDR showed positive and insignificant relationships with ROE while LDR correlated with ROE positively and significantly. We recommend that management of the DMBs should pursue optimal and effective management of their liquidity in line with prudential guidelines so as to remain profitably in business.

Keywords: Optimal, Liquidity Management, Financial Sector, Performance, Return on Equity,

Introduction

The financial sector is the backbone of any economy, providing essential services that facilitate economic growth and development but liquidity and its proper or optimal management is very vital towards the efficient dispensation of these services (Babalola, 2008). Suffix it to say that the effectiveness and efficiency of the sector will go a long way to determine what happens in the economy in terms of growth rate and development trends and this will only be achieved when the sector's liquid position is well harnessed (Akinwale and Adams, 2013). In this study, the deposit money banks (DMBs) are used to represent the financial sector since they have huge and dominant operations in the sector.

In Nigeria, the financial sector has passed through some significant growth, transformation and consolidation exercises over the years, driven by economic reforms, technological advancements, and changes in consumer behavior. However, that is not to say that the sector is totally free of challenges at present, hence this issue of liquidity management is still a paramount area of interest because of its implications to banks' financial stability, profitability and overall economic growth.

Liquidity management is a critical aspect of financial sector management and dominant to the core operations of the DMBs globally and Nigeria is not an exception. Liquidity is what enables a bank and other financial institutions to meet their short-term obligations, maintain

stability, attain sound performance and profitability and also support economic growth of their host nations. Abata (2014) posited that an efficient financial system is essential for building a sustained economic growth and an open vibrant economic system hence countries with well-developed financial institutions tend to grow faster; especially the size and liquidity of the banking system and of the stock markets tend to have strong positive impact on economic growth.

Basically, all the activities inherent in the banking industry which is majorly financial intermediation; sourcing fund from the surplus savers and lending to the lacking users, investment etc are centered on the sector's ability to manage her liquidity effectively (Ebiringa and Chigbu, 2012) Davinga (2010) asserted that organisations are required to be solvent to enable them meet with their business obligations adequately and DMBs are not left out. Ebochie (2013) stated that banks are said to be solvent or liquid when they are able to meet their own obligations as and when due, fund deposit and make such payment on customer's order.

In the words of Obizue and Obizue (2018), Liquidity is very important to the life of business organisations because it provides the ability to respond to changing financial circumstances like unexpected expenses or changes in income, reduces the risk of financial distress and defaults on debts and as well supports economic growth by enabling businesses to invest in new opportunities and create jobs.

According to Amaechi and Okeke (2021), effective liquidity management involves managing cash flows, maintaining sufficient liquidity buffers, and ensuring that assets can be easily converted into cash when needed. They further emphasized that liquidity management requires a deep understanding of the financial institution's assets, liabilities, and off-balance-sheet activities as well as the ability to forecast cash flows and anticipate potential liquidity risks.

Abata (2014) stated that the liquidity position of the financial sector especially as it relates to the deposit money banks is usually determined by some economic factors which are not far from the macroeconomic conditions, monetary policy and global economic trends. The 2008 global financial crisis highlighted the importance of effective liquidity management in the Nigerian financial sector. The crisis led to a significant decline in liquidity, which had far-reaching implications for financial stability and economic growth. Since then, the sector has implemented various reforms aimed at strengthening liquidity management and promoting financial stability. The correlation between effective liquidity management and financial sector performance cannot be over-emphasised. Duru and Ejike (2014) advocated that liquidity and financial performance are so critical in every business operation while Kelvin (2016) upheld that liquidity has been recognized as a major objective in working capital management and as a dominant pillar of cash management exercises. The trade-off between liquidity

and performance is very risky and should be properly handle to avoid any form of mismatch that could endanger the operational potential of the business. The higher the risk, the greater the business yields hence it is important for banks to meet this trade-off demand and avoid any negative effect of the mismatch between their assets and liabilities (Robert, 2013).

In support to this, Ndugbu, Ihejirika and Uzo-Ahunaya (2024) observed that the deregulation that took place in the financial sector in the last quarter of 1986, macroeconomic reforms such as the internationalization of the capital market can affect positively the performance of the industry as an intermediate financial institution and also the recent withdrawal of all public funds from the banks (treasury single account) by the Central Bank of Nigeria (CBN) is expected to affect banks' lending function negatively as well as the profitability of the industry. Obizue and Obizue (2018) stated that it is important to understand that the effective macroeconomic policy that increases income will increase bank deposit and also expand lending capacity which can positively affect the profitability or performance level of the banking industry. They emphasised that poor macroeconomic policies have the capacity of upsetting and harming the performance of the banking sector. The banking sector crisis of the 1990 was caused by macroeconomic instability and high risk concentration of the period (Doryan, 2012). Babalola (2008) averred that the withdrawal of all public funds from the banking industry in the 1990s led to monetary policy shocks which in turn led to the collapse of some banks.

Liquidity is a major threat and demand in banking operations and banks' management are consciously striving to maintain adequate liquidity as well as attain a sound financial performance level so as to remain in business, discharge their obligations to their various customers and maximize the shareholders investments. The relationship between liquidity and performance is opposite and extremely conflicting. Idolor and Adelegan (2023) opined the DMBs are constantly contending with the intricate and inverse relationship that exists between liquidity and financial performance and that the main objective of DBMs is to maximize profit and optimize liquidity position in order to ensure their survival in the ever-competitive business world.

Despite every efforts, liquidity management remains a significant challenge for the Nigerian financial sector in their quest to also attain a level of financial performance. The sector's reliance on short-term funding sources, inadequate liquidity buffers, and limited access to long-term funding have created significant liquidity risks which have an impacting implication to their ever-desirous financial performance. Abata (2014) advocated that liquidity risks have been exacerbated by macroeconomic conditions, including fluctuations in global oil prices, which have impacted the sector's liquidity position and overall stability.

Due to the importance of liquidity management in maintaining financial stability and promoting economic growth, a lot of research studies have been carried out in this aspect of banking yet researchers have not reached a consensus on the way forward to specifically manage the liquidity position of DMBs amid their chase for enhanced performance and this has given rise to some current bank failures notwithstanding the different consolidated activities that have gone on in Nigeria (Obizue and Obizue, 2018).

It is on this premise that the researchers have seen it as a necessity to address this knowledge gap by examining the relationship between liquidity management and financial sector performance in Nigeria by way of seeking to discover or identify strategies that could help in improving liquidity management in the Nigerian financial sector.

The main objective of this study is to empirically investigate the relationship between optimal liquidity management and financial sector performance in Nigeria. The specific objectives are to;

1. determine the relationship that exists between Cash to asset ratio (CAR) and ROE of DMBs in Nigeria

2. examine the impact of Cash to deposit ratio (CDR) on ROE of DMBs in Nigeria

3. ascertain the effect of Loan-to-deposit ratio (LDR) on ROE of DMBs in Nigeria

In accordance with the above stated objectives, the researchers proffered the following research questions.

What is the relationship between Cash to asset ratio (CAR) and ROE of DMBs in Nigeria

How does Cash to deposit ratio (CDR) impact on ROE of DMBs in Nigeria

What is the effect of Loan to deposit ratio (LDR) on ROE of DMBs in Nigeria

In view of the research objectives and questions, three hypotheses were stated in their null forms in this study

H01. Cash to asset ratio (CAR) is not a significant function of on ROE of DMBs in Nigeria

H02. Cash to deposit ratio (CDR) has no significant impact on ROE of DMBs in Nigeria

H03. Loan-to-Deposit ratio (LDR) does not significantly affect the ROE of DMBs in Nigeria

Literature Review

Structure of Nigeria's Financial Sector

Nigeria's financial sector is a critical component of the country's economy, playing a vital role in facilitating economic growth and development. The sector is comprised of various institutions, including banks, insurance companies, pension funds, and capital market operators.

In this overview, we will briefly examine the structure, key characteristics and challenges of the sector.

The Nigerian financial sector can be broadly categorized into the following sub sector. First, the banking sub-sector. Ndugbu et al (2024) stated that the banking sub-sector is the major and dominant section of the financial sector of Nigeria and it comprises of the different deposit money banks that operate in the nation. They further emphasised that the banks provide a wide range of financial intermediation services which include deposit mobilization, credit creation, and payment services.

The insurance sub-sector provides risk management services to individuals and businesses, including life insurance, non-life insurance, and reinsurance while the capital market Sub-Sector provides a platform for the issuance and trading of securities, including stocks, bonds, and mutual funds. In line with that, the pension sub-sector retirement savings services to individuals, including the management of pension funds. The other category includes other financial institutions, such as microfinance banks, mortgage banks, and development finance institutions. In the words of Benjamin (2013) and Adewale and Adams (2013), the Nigeria's financial sector can be characterized by the dominance of banking sub-sector, accounting for the largest share of total assets and deposits, limited depth and breadth, with a small number of large players dominating the market, high fragmentation with many small players operating in the market, limited access to financial services particularly in rural areas, a significant proportion of Nigeria's economy operates informally with many businesses and individuals lacking access to formal financial services (Alajezera, 2017). Ebiringa and Chigbu (2012) observed that the Nigerian financial sector is not void of challenges like Liquidity Management Challenges including limited access to long-term funding and high levels of liquidity risk, Credit and Operational Risk particularly in the banking sub-sector, due to high levels of fraud and non-performing loans. Regulatory Challenges, the regulatory framework in Nigeria seems to be inadequate and with limited capacity and Infrastructure Challenges like limited access to technology and other infrastructure as it affects some institutions in the sector.

Meaning of Liquidity

Many scholars have defined liquidity from different perspectives and they all have similar contents. Liquidity can generally be seen as the term used to describe the solvency of a business and which has special references to the degree of readiness which can be converted into cash without loss. Obizue and Obizue (2018) defined liquidity as the quality of a financial asset which makes it certain that such asset can easily be marketed and converted into cash. In another manner, liquidity refers to the ability of an individual, business, or financial institution to meet their short-term financial obligations, such as paying bills, debts, or meeting unexpected expenses. In other words,

liquidity is the ability to convert assets into cash quickly and efficiently without significantly affecting their value. According to Idolor and Adelegan (2023), liquidity means the amount of capital that is available for major investment. This is validated in another definition of Obizue and Obizue (2018) that liquidity is the capital structure at the disposal of a bank, readily used for investment purposes. There are several types of liquidity which include Cash Liquidity (ability to meet financial obligations using cash and other liquid assets), Market Liquidity (ability to buy or sell assets quickly and efficiently without significantly affecting their price) and Funding Liquidity (ability to meet financial obligations using funding sources, such as loans or credit lines. There are several measures of liquidity, including Liquidity Ratio, Cash Flow and Current Ratio.

Liquidity Management

Liquidity management refers to the process of managing an organization's liquidity position to ensure that it has sufficient liquid assets to meet its short-term financial obligations.

Akinwale and Adams (2013) advocated that liquidity management is important because it helps to ensure that the organization has sufficient liquid assets to meet its short-term financial obligations, maintain financial stability and support business growth by enabling the organization invest in new profitable opportunities.

The goal of liquidity management is to maintain a balance between liquidity and profitability, while minimizing the risk of liquidity shortages. According to Sufian and Chong (2008), liquidity is aimed at ensuring that the organization has sufficient liquid assets to meet its short-term financial obligations, reducing the risk of liquidity shortages, which can have negative consequences for the organization, optimising organization's liquidity position by taking into account factors such as interest rates, market conditions, and regulatory requirements and ascertaining compliance with regulatory requirements and industry standards related to liquidity management. The absence of sound liquidity management is a major limiting factor to the financial performance of deposit money bank not only in Nigeria but anywhere in the world. Some researchers have examined the impact of liquidity management on banks financial performance in different dimensions (Ejoh and Iwara, 2014)

Financial Performance

Alajezera (2017) asserted that financial performance refers to the financial health and well-being of an organization, typically measured by its ability to generate revenues, control costs, manage assets, and achieve profitability. It encompasses various aspects of an organization's financial activities including profitability, solvency, revenue generation, asset management etc.

According Abata (2014) the performance of a firm serves as a benchmark in judging the efficiency and effectiveness of their business unit, department, branch and the organization

as a whole and banks are not exempted. Bank performance has always attracted the interest of researchers and bank stakeholders (depositors, management, investors, shareholders, regulators and government) who hinge their confidence on it.

Obizue and Obizue (2018) posited that bank performance is judged by the extent to which a bank accomplishes useful operations estimated in terms of timely discharge of her obligations to its publics with minimal risk and remarkable level of profiting. Banks' performance among other things means the ability of a bank to be in the position to consecutively maintain good financial position and actively meet the needs of its shareholders and other stakeholders (Obizue and Obizue, 2018).

In order to achieve these profits, banks must employ the funds obtained from different sources and work effectively to reduce its operating expenses and costs

Banks' financial performance is traditionally measured by their profitability margin hence the most critical challenge facing every bank management in this present competitive financial market is how to maximize profit while operating within the ethical, professional and prudential limits as prescribed by their regulatory bodies. The extent of a bank's success and/or failure is what explains whether such bank is performing well or not and this is usually revealed through a careful study of their financial statements.

In the words of Robert (2013), profit is the general increase of cash generated over capital invested within a given period of time. Benjamin (2015) noted that profitability is always related with performance and productivity. He further stated that pure profit is the increase that an investor realizes out of his investment efforts after considering all costs associated with such investment including the opportunity costs. According to Alajezera (2017), profitability is defined as the relationship or difference between earnings and operating cost (margins) and investments made to the achievement of such margins. He also puts it as the ability of the firm to achieve an increase in the value of invested assets.

Measurement of Banks' Financial Performance

In line with earlier studies that examined the determinants of banks' performance, there are different measures of performance. Banks' performance can be measured through their profit after tax (PAT), return on asset (ROA), return on equity (ROE), net interest margins (NIM), earnings per share (EPS) etc. This study used ROE as the index for measuring financial performance of DBMs hence explained below.

Return on Equity (ROE)

ROE indicates the return to shareholders on their equity. Robert (2013) averred that ROE reflects how effectively bank management is using shareholders' funds. It is calculated by dividing net income with total equity capital or ROA times the total equity ratio-to-asset.

According to Ebiringa and Chigbu (2012), ROE is often referred to as the bank's equity multiplier, which measures financial leverage.

Liquidity and Banks' Performance

Liquidity is a major factor in the determination of banks' performance. It refers to the ease and certainty with which a bank's asset can be turned into cash.

Davinga (2010) defined liquidity as being able to meet every financial need as at when due be it withdrawal or credit demands as the case may be. NDIC (2014) posited that Liquidity is the quality of an asset which makes the asset easily convertible into cash with little or no risk of loss and that a bank is considered liquid when it has sufficient cash and other liquid assets, together with the ability to raise funds quickly from other sources to enable it to meet its payment obligation and financial commitments in a timely manner.

Kelvin (2016) refers liquidity as the speed and certainty with which an asset can be converted back into cash whenever the asset holder desires. Ebochie (2013) views liquidity management as the act of storing enough funds and raising funds quickly from the market to satisfy depositors, loan customers and other parties with a view to maintaining public confidence.

Cash is an important current asset for the operation of any business. It is needed as a critical input for the business of banking to run continuously and conveniently resulting to profit-making. A deposit money bank as a business concern actually needs to have cash and liquid assets which it can easily convert into cash at short notice. For banks to remain in the business of financial intermediation, they must formulate policies to ensure the availability of cash and liquid assets in their asset portfolio at any point in time.

According to Duru and Ejike (2014), deposit money banks need a high degree of liquidity in its assets portfolio to be profitable. A bank must hold a sufficient proportion of its assets in the form of cash and liquid assets for the purpose of profitability. If a bank takes liquidity as a priority, its profit will be low because it may not be engaging in profitable business ventures at its disposal just for the purpose of fear of illiquidity. Robert (2013) asserts that if a bank ignores liquidity and aims at earning more profit, it could be disastrous for it. Bank management must therefore continuously strike a balance between the objectives of liquidity and profitability in investment portfolio of a bank. This balance must be achieved with a relatively high degree of safety and such bank will have to engage in strategic and well-articulated credit and liquidity risk management policies.

Theories

This study is grounded in a theoretical framework that elucidates the concepts and theories pertinent to asset and liability management. The framework is chosen because of the empirical linkages between asset and liability management, liquidity management, and financial performance.

Effective asset and liability management is crucial for banks to maintain liquidity and achieve optimal financial performance. Any mismatch in asset and liability management can lead to liquidity challenges, underscoring the importance of this concept in the banking sector.

Among the theories of Bank liquidity, only two are examined in this study.

Profitability Trade-Off Theory of Liquidity

This is another theory upon which this study is hosted. The theory posits that a trade-off exists

between the liquidity and the financial performance of a firm, and that a firm cannot pursue the two objectives of being profitable and being liquid at the same time without automatically affecting the other. The theory presupposes that the regulation of banks is necessary to maintain safety and soundness of the banking system, to the extent, which put banks in a position to meet their liabilities without difficulty.

Previous studies showed that banks with higher liquidity and larger capital buffers are less vulnerable to failure during financial crisis, Bagyenda, Brownbridge and Kasekende (2011) and this made it imperative for the regulatory authorities to compel greater solvency and liquidity on individual banks than making it optional.

Theory of Asset and Liability Management (ALM)

ALM is a dynamic and ongoing process that involves planning, organizing, coordinating, and controlling assets and liabilities to achieve optimal financial performance. According to Tamiru (2013), SLM involves the mix of volume, maturities, yield, and costs of assets and liabilities in order to achieve a specified net interest income.

The primary goal of ALM is to match assets and liabilities in terms of maturity and interest rate sensitivity, thereby minimizing interest rate and liquidity risks.

In other words, it deals with the optimal investment of assets in view of meeting current goals and future liabilities. It is related to the management of the risks associated with liquidity mismatch, interest rates and foreign exchange movements. Therefore, ALM is concerned with an attempt to match assets and liabilities in terms of maturity and interest rate sensitivity to minimize interest rate and liquidity risks. In other words, Asset and Liability Management often abbreviated as ALM is the practice of managing risk that arises due to mismatches between assets and liabilities.

Empirical Review of Related Literatures

A good number of studies have been carried out on the effect of liquidity management on banks' performance in Nigeria and other countries of the world, it therefore becomes pertinent to review such studies in order to examine and ascertain their similarities and differences from this present study.

Amaechi and Okeke (2007) suited the determinants of commercial banks' profitability in Nigeria. Secondary data were gathered from the corporate annual reports and accounts of selected banks from 1990 to 2005 The results indicate that there exists a significant association amid liquidity management and financial performance of Deposit Money Banks in Nigeria. The study recommends that Deposit Money Banks should employ good liquidity management mechanisms for a good performance and the Deposit Money Banks should reorganize its internal financial system in order to adapt to changes within the changing bank sector policies.

Akpan and Ahmed (2012) carried out a report on analyzing the impact of bank specific and industry specific factors on financial performance of banks in Nigeria. The study adopted an expote facto design in analyzing the substantial issues influencing the performance of DMBs. Study adopted regression analysis model to measure profitability and the correlation analysis that measured the multicollinearity to assess the situation of linear relationship between variables. Results in this study indicated that mixed relationship on how the explanatory variables affected banks's performance measured with ROA.

Robert (2013) studied the profitability behavior of some selected banks in Nigeria over the period 1998-2012. The study used profit after tax as the dependent variable which they regressed against the bank specific factors. They sourced their data from the NDIC annual report and conducted the various tests using the OLS statistical tool. A key result is that the effect of market concentration is positive while the macroeconomic variables have a mixed influence on banks' profitability. They recommended that the empirical results suggest that the enhancement of bank profitability in those countries requires new standards in risk management and operating efficiency which according to the evidence presented in the paper, crucially affect profits.

Adewale and Adams (2013) examine effect of CAMELS on banks' performance management ability of deposit money banks using Nigeria as a case study. Three Nigerian Deposit Money Banks were purposively selected on cross sectional basis using Pooled Least Square (PLS) method and regression analysis covering a period of 12 years (2000-2012) to analyse the adapted model. The results of the analysis revealed that all the explanatory variables have impact on bank performance as they all showed a significant positive relation at constant effect stage but later showed an insignificant positive relationship at fixed effect stage.

Obizue and Obizue (2018) empirically examined the impact of effective liquidity management and banks' performance in Nigeria between 2000 and 2015. The dynamic process of bank liquidity management in a fast developing economy. The authors applied the panel data analytical method to a long panel data sets of Nigerian banks from January 2000 to August 2015. The empirical results showed that cash

reserve ratio, loan to deposit ratio have positive and significant relationship with return on assets of deposit money banks and strongly support their conclusion that optimal liquidity has profound influence over the financial performance of banks in Nigeria.

Methodology

This study employed the quasi-experimental research design. Secondary data were sourced from the audited annual financial reports of the ten firms listed on the Nigerian Stock Exchange for the period under review (specifically the income statement and statement of financial position). The model specified in this study followed the empirical studies of Madukaku and Nwawu (2014), Ihejirika et al (2020) and Asen et al (2021). Consequently, we specified a model in this study where return on equity (ROE) is used as proxy for firms' performance while the ratio of deposit to assets (DAR), ratio of cash to deposit (CDR) and ratio of loan to deposit (LDR) are used as capital structure indices.

Therefore the functional form of the model is represented below as;

ROE = f (DAR, CDR, LDR)……..(1)

Expressing the model in econometric format we have;

ROEit = b0 + b1DAR + b2CDRit + b3LDRit + Uit (2)

Where ROE = Return on Equity of DMBs in Nigeria

DAR = Ratio of deposit to assets of DMBs in Nigeria

CDR = Ratio of cash to deposit of DMBs in Nigeria

LDR = Ratio of loan to deposit of DMBs in Nigeria

Uit = Stochatic error term (unexplained variables in the model)

b0 = Constant

b1 - b3 = The unknown parameters to be estimated

The study is a cross-sectional time series analysis hence it adopted the panel data analytical technique. Firstly the pool unit root test was carried out to avoid having spurious results. In conducting the panel data analysis, the Hausman test specification was carried out in order to effectively choose the consistent and best performing effect between the random effects and the fixed effects. The Eview 10.0 econometric software was used for the analysis.

Data Analysis and Interpretation of Results

Unit Root Test Result

Pool unit root test:
SummarySample:
2010 2022

Exogenous variables: Individual effects Automatic selection of maximum lags Automatic lag length selection based on SIC: 0

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*	-41.4661	0.0000	70	200
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-11.8055	0.0000	70	200
ADF - Fisher Chi-square	217.010	0.0000	70	200
PP - Fisher Chi-square	255.451	0.0000	70	200

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

In the result above, four test statistics were specified. These include: Levin, Lin & Chu statistics, Im, Pesaran and Shin W-statistic, ADF-Fisher Chi-square and PP- Fisher Chi-square tests with their associated test statistic and probabilities. The summary results indicate that the series were all stationary at level. Thus, the null hypothesis of a unit root was rejected.

Estimated Results

The relationship between return on equity and financial performance of DMBs indices; (DAR, CDR and LDR) were estimated using both the random and fixed effects methods while the Correlated Random Effects - Hausman Test was used to compare the two sets of estimates to determine the one that is consistent and proper for the estimation.

Correlated Random Effects - Hausman Test

Pool: POOL01

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	12.412017	5	0.0296

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
DAR?	-0.175416	0.144919	0.033801	0.0814
CDR?	0.104148	0.344882	0.024693	0.1255
LDR?	0.155054	0.597430	0.024540	0.0047

The result above reported a significant difference between the random effects specification and that of the fixed effects specification with a chi-square value of 12.412017 at 5 degrees of freedom and 0.0296 probability which is less than the 5% benchmark. This indicates that the fixed effects specification is superior to the random effects specification. This implies that the random effects model is inconsistent and hereby rejected while the fixed effects model is adopted for the estimation of the relationship between return on equity and financial performance of DBMs as presented below.

Results of Estimated Fixed Effects Model

Dependent Variable:
ROE? Method: Pooled
Least SquaresDate:
02/12/24 Time: 20:57
Sample: 2010 2022

Included observations: 5

Cross-sections included: 10

Total pool (balanced) observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	22.33988	28.94777	0.771731	0.4455
DAR?	0.164977	0.349238	1.454515	0.1520
CDR?	0.154148	0.451519	0.320612	0.1210
LDR?	0.155054	0.462342	0.335366	0.4386
R-squared	0.837388	Mean dependent var		15.08400
Adjusted R-squared	0.837414	S.D. dependent var		8.563374
S.E. of regression	2.515011	Akaike info criterion		4.925757
Sum squared resid	221.3848	Schwarz criterion		5.499363
Log likelihood	-108.1439	Hannan-Quinn criter.		5.144189
F-statistic	31.07282	Durbin-Watson stat		1.400240
Prob(F-statistic)	0.000000			

From the result above, the following results were obtained, the Adjusted R-squared value of 0.837414 or 83.7% indicating that the liquidity management variables explain about 84.0% of the variation in return on equity of DMBs sampled. The t-test statistical tool is used to test for the individual significance of the estimated parameters and hereby analysed under.

Total deposit to asset ratio (DAR) has a t-Statistic value of 1.454515 and probability of 0.1520. With this, the null hypothesis that deposit to asset ratio of DMBs has no significant relationship with ROE at 5% level of significance was accepted. Nevertheless, there is a positive relationship between deposit to asset ratio (DAR) and return on equity as indicated by the coefficient of 1.664977. Similarly, the cash to deposit ratio (CDR) recorded the coefficient, t-test statistic and probability values of 0.154148, 320512 and 0.1210 respectively and this implies a positive and insignificant relationship with ROE. The probability that is more than 5% significance level suggests the acceptance of the null hypotheses which stated that they have no significant relationship with return on equity (ROE). Conversely, the loan to deposit ratio (LDR) with the coefficient of 0.0155054 and probability of 0.04386 revealed a positive and significant correlation with the ROE of DMBs in Nigeria since the probability value is below the 5% level of significance.

The F-test result with f-statistic value of 31.07282 and probability value of 0.0000 indicate that the explanatory variables have a joint and significant influence over ROE. It can be concluded that the model has predictive value. The test for Serial or Auto-Correlation Test revealed the Durbin-Watson statistic of 1.400240 which tends towards 1 and indicates that there may be serial or auto-correlation in the residuals of the estimated model.

Discussion of Findings

This study examined the impact of liquidity management on financial performance in Nigeria from 2010 to 2022 and the following findings were made;

The result of the study indicated that there was mixed relationship among the liquidity indices and DMBs performance owing to the fact that DAR and CDR showed positive and insignificant relationship with the ROE of DBMs while LDR indicated a positive and significant impact of the ROE. This finding aligns with that of Alajezera (2017) who also found positive coefficients of liquidity variables and concluded that liquidity is a good predictor of DMBs' performance.

The joint influence of liquidity management variables over ROE as revealed by the F-test result in this study further confirms that liquidity management is a good predictor in determining the financial performance of DMBs in Nigeria. This findings also gained credence from the views of Ejoh and Iwara (2014) and Obizue and Obizue (2018) and that an optimum or effective liquidity management enables banks to discharge their operational obligation and engage in profitable investment to generate maximum returns to shareholders hence they concluded that liquidity management plays an important role in the growth and development of the economy

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