



EFFECT OF LIQUIDITY RISK MANAGEMENT ON BANK PERFORMANCE IN NIGERIA

EDEWUSI, Damilola Gabriel

Department of Finance, Faculty of Management Sciences,
Ekiti State University, Ado-Ekiti, Ekiti State, Nigeria

ADELEKE, Kareem Olalekan 

Department of Banking & Finance, Federal Polytechnic, Ado-Ekiti, Ekiti State, Nigeria
okadeleke@gmail.com

ADEKANMBI, Kehinde Oladeji

Department of Finance, Faculty of Management Sciences,
Ekiti State University, Ado-Ekiti, Ekiti State, Nigeria

Abstract

This study investigated the effect of liquidity risk management on bank performance in Nigeria and covered a period of 5 years between 2013 and 2017 using five banks to determine the relationship between bank liquidity and return on asset of Deposit Money Banks and examine the relationship between bank liquidity and loans and advances of Deposit Money Banks. The study adopted pool regression of ordinary least square and specified return on asset as proxy for bank performance while current ratio, liquid assets to total asset ratio, loans and advances to deposits ratio, cash to total deposits ratio and loans and advances to total assets ratio were proxy for liquidity management. The result showed that there is significant effect between return on asset, Loans and advances to total assets ratio and Loans and advances to deposits ratio variables while Current ratio, liquid assets to total asset ratio and cash to total deposits ratio were insignificant with the deposit money banks in Nigeria. The study concluded that liquidity risk management has significant effect on performance of Deposit Money Banks in Nigeria. Thus, the liquidity management of DMBs in Nigeria maximizes returns to shareholders but is

producing less than optimal profitability in terms of efficient utilization of assets. The study therefore recommended that should continue using assets, limiting purchases of inventory and increase sales without purchasing new assets.

Keywords: Liquidity risk, Management, Bank Performance, Nigeria

INTRODUCTION

Strengthening the financial sector is a pivotal concern for any economy (Paul, 2013). Banks are the main participants in any economy and perform important activities on both sides of the balance sheets: they enhance the flow of funds by lending cash to short-term users on the assets side; and provide liquidity on the liability side (Lawal, 2012). The role of banks can be diversified into financial intermediaries as it channels the financial resources from surplus economic units to deficit economic units, i.e., as facilitator and supporter (Tesfaye, 2012). Financial institutions are effective mediators between savers and borrowers, like investment banks, central banks, development banks and commercial banks, while performing this financial intermediary role.

Deposit Money Banks have become the main institutions with the passage of time, because banks work as retail banking units and facilitate the transfer of financial assets that are required from lenders to other financial assets that are desired by the public. So, considering the fact that the activities of commercial banks affect the greater part of society, they have been selected as the major focus of this study. The financial intermediary role of commercial banks is the bedrock for two essential functions, namely, deposit mobilization and credit extension (Muhammed, 2015).

There appears to be an interminable argument in the literature over the years on the roles meaning and determinants of liquidity and credit management. The Nigeria financial environment has noticed increase in credit which has become a problem to the country. Banks have traditionally provided liquidity on demand both to borrowers with open lines of credit and un-drawn loan commitments and to depositors in the form of checking and other transactions account. In fact the combination of these two products in a single firm constitutes working definition of a bank. The liquidity insurance role of banks however exposes them to the risk that they will have insufficient cash to meet random demands from their depositors and borrowers.

There is a large theoretical literature that attempts to understand banks role in liquidity production. This literature initially emphasized this risk associated with demand deposits that expose banks to the possibility of a catastrophic run. Diamond and Dybig (2013) explain the structure of banks by arguing that by pooling their funds in an

intermediary, agents can insure against idiosyncratic liquidity shocks while still investing most of their wealth in high-return but illiquid projects. This structure however, leads to the potential for a self-fulfilling bank run and sets up a policy rationale for deposit insurance. MacDonald and Koch (2006) explored that a bank is liquidity when it has capacity to acquire immediately available funds at a reasonable price and stresses that liquidity planning is an important facet of asset and liability management in banks. Thus, liquidity is a prime concern in a banking environment as a shortage of liquidity has often been a cause for most banks failures.

Larry (2015) reiterated that the recent financial crises that erupted in Europe and other countries were marked by liquidity problem. It is therefore clear that, the role of liquidity in banks portfolio management cannot be over emphasized as liquidity essential means the ability to meet its financial obligations as they fall due. Portfolio management on the other hand refers to the product management of banks assets, so as to meet its set objectives. Liquidity management is an important aspect of monetary policy implementation. Liquidity Ratio (LR) which is one of the complementary liquidity measures was reduced from 40% in 2007 to 30% in 2008 at the global financial crisis so as to enhance the liquidity profile of banks (NDIC, 2008).

Aleksandras and Jelena (2006) pointed out that the ability for fund increases in assets and to meet obligations as they come due are fundamental to the ongoing validity of any banking organization and they stressed that managing liquidity is among the most important activities in banks. They further argued that the importance of liquidity transcends the individual banks, since a liquidity shortfall at a single institution can have a system-wide repercussion adding that, the analysis of liquidity requires bank management not only to measure the liquidity position of the bank on a going basis, but also to examine how funding requirements are likely to involve. Similarly, Cabello (2013) noted that bank liquidity management has become a major issue during the financial crisis as liquidity shortages have intensified and have put pressure on banks to diversify and improve their liquidity sources. He opined that a significant strand of the literature concentrates on wholesale liquidity generation and on the alternative to deposit funding and that the management of inventory of cash holdings within the banks are also relevant issues and that any significant improvement in cash management at the bank distribution channels may have positive effect in reducing liquidity tension in banks.

It has been asserted that most underlying liquidity problem in banks is largely due to mismatching of asset and liability and by extending loans or credit to high-risk borrowers. Thus, a well-managed bank should be able to monitor its cash position or need carefully and try as much as possible to maintain a low liquidity risk (Cabello, 2013; Larry, 2015). NDIC (2014) reported that the banking industry liquidity risk has been moderated during the period under review, and that the industry average liquidity ratio rose from 50.63 percent in 2013 to

53.65 percent in 2014 and this was well above the prudential minimum threshold of 30 percent. According to the report individually, all Deposit Money Banks (DMBs) in their industry had liquidity ratio in excess of the minimum prudential requirement of 30 percent as at 31st December 2014, indicating that all Deposit Money Banks (DMBs) were sufficiently liquid.

In the light of the aforesaid, the broad objective of this study is to investigate the effect of liquidity risk management on bank performance in Nigeria while the specific objectives were to examine the effect of current ratio, liquidity asset to total asset ratio, loan and advances to deposit ratio, total deposit ratio and loan and advances to total asset ratio on banks performance. Thus, the paper is structured as follows; Section two provides the relevant literature review, section three entails the methodology, while section four discusses the findings and section five concludes the study and proffer recommendations.

LITERATURE REVIEW

Risk

Risk is part of life. Avoiding all risk would result in no achievement, no progress and of course, no reward. Ordinarily, risk is associated with the likelihood of a negative outcome. However, in management, risk is the chance that an investment's actual return will be different than expected. A fundamental idea in finance is the relationship between risk and return on investment. It implies future uncertainty about deviation from expected earnings or expected outcome and measures the uncertainty that an investor is willing to take to realize a gain from an investment. There are different types of risks: liquidity risk, sovereign risk, insurance risk, business risk, default risk, etc (The Economic Times, 2015).

From the above, it could be noted that there are different definitions of risk for each of several applications. The widely inconsistent and ambiguous use of the word is one of several current criticisms of the methods to manage risk (Douglas, 2009). The standard is intended to help organizations measure, report on and systematically improve the effectiveness of their information security management systems. It improves guidance on the development and use of measures and measurement in order to assess the effectiveness of an implemented information security management system (ISMS) and controls or groups of controls (ISO, 2009). This would include policy, information security risk management, control objectives, controls, processes and procedures, and support the process of it revision, helping to determine whether any of the ISMS processes or controls need to be changed or improved. The Standard has the following key sections: information security measurement overview, management responsibilities, measures and measurement development, measurement operations, data

analysis and measurement result reporting, information security measurement program evaluation and improvement.

The Institute of Risk Management (2014) defines risk as the combination of probability of an event and its consequence. Consequences could range from negative to positive. All organizations have objectives at strategic, tactical and operational levels and anything that makes achieving these objectives uncertain is termed as risk. Risk is also defined in terms of probability of an event and its consequences. Cohen (2012) posits that risk is simply mixing courage and common sense. In another definition, risk is regarded as future issues that can be avoided or mitigated, rather than present problems that must be immediately addressed. The simple fact is that risk is always a probability issue. Possibility is a binary condition either something is possible, or it's not: 100 percent or 0 percent. Probability reflects the continuum between absolute certainty and impossibility. The key thing to keep in mind is that establishing probabilities is not the same thing as foretelling the future. Occupational Health & Safety Advisory Services (2010) defines risk as the product of the probability of a hazard resulting in an adverse event, times the severity of the event.

Risk Management

Risk management is a systematic process of understanding, evaluating and addressing risks to maximize the chances of objectives being achieved and ensuring organizations, individuals and communities are sustainable. It also enables the organization to be aware of new possibilities. In effect, risk management requires an informed understanding of relevant risks, an assessment of their relative priority and a rigorous approach to monitoring and controlling them. It is indeed the practice of identifying potential risks in advance, analyzing them and taking precautionary steps to reduce or curb the risk. In finance and business term, when an organization makes an investment decision, it exposes itself to a number of financial risks. The quantum of such risks depends on the type of financial instrument. The financial risks might be in form of high inflation, volatility in capital markets, recession and bankruptcy and so on. In order to minimize and control the exposure of investment to such risks, bank managers and investors resort to the practice of 'risk management. Tsevisani (2007) holds the view that the interaction between human factors and tangible aspects of risk highlights the need to focus closely on human factors as one of the main drivers for risk management: a change driver that comes first of all from the need to know how humans perform in changing environments and in the face of risks.

Liquidity

According to Olagunji, Adeyanju and Olabode (2011), liquidity refers to the ability of a bank to ensure the availability of funds to meet financial commitments or maturing obligations at a reasonable price at all times. Put differently, bank liquidity means banks having money when they need it particularly to satisfy the withdrawal needs of their customers. The survival of deposit money banks depends greatly on how liquid they are, since illiquidity, being a sign of imminent distress, can easily erode the confidence of the public in the banking system and results to run on deposit. Liquid assets should be marketable or transferable. This means, they are expected to be converted to cash easily and promptly, and are redeemable prior to maturity. Another quality of liquid assets is price stability. Based on this characteristic, bank deposits and short term securities are more liquid than equity investments due to the fact that the prices of the former are fixed than the prices and value of the later (Richard, 2013).

According to the financial stability review from Banque de France (2008), liquidity is defined as the ease with which value can be realized from the sales of assets. Value can be realized by using credit worthiness to acquire funds from external markets or through the sales of assets in the market place. Also liquidity can be easily understood as a measure of how likely a bank will meet its short or long term obligations, such as will a bank able to settle its liabilities on time?

From the market point of view, liquidity means: the degree of which an asset or security can be bought or sold in the market without affecting their prices. Hereby, assets which can be bought or sold easily are known as liquid assets. The ability to change assets to cash easily is called "marketability". Expected and unexpected obligations can be met with liquidity issues during daily business operations, while business should be operated uninterrupted. With insufficient cash resources, business operating can be damaged; more importantly, it could be confronted to severe financial distress of whole economy with serious liquidity constrain in banking system. Therefore, liquidity could be a vital element of financial management and must be managed with caution.

Liquidity may be viewed as a measure of the relative amount of asset in cash or which can be quickly converted into cash without any loss in value available to meet short term liabilities, while liquid assets are composed of cash and bank balances, debtors and marketable securities; liquidity is the ability of a firm to meet all obligations without endangering its financial conditions (Olagunju, Adeyanju & Olabode, 2011).

According to Agbada and Osuji (2013), bank liquidity simply means the ability of the bank to maintain sufficient funds to pay for its maturing obligations. It is the bank's ability to immediately meet cash, cheques, other withdrawals obligations and legitimate new loan

demand while abiding by existing reserve requirements. Bhattacharyya and Sahoo (2011) argued that Liquidity management by Central banks typically refers to the framework, set of instruments, and the rules that the monetary authority follows in managing systemic liquidity, consistent with the ultimate goals of monetary policy.

In this regard, central banks modulate liquidity conditions by varying both the level of short-term interest rates and influencing the supply of bank reserves in the interbank market. Effective liquidity management is a key factor that helps sustain bank profits and concurrently keeps the banking institution and the financial system generally from illiquidity and perhaps, insolvency. In order to maintain public confidence on the financial system of the country, banks are required to maintain adequate amount of cash and near cash assets such as securities to meet withdrawal obligations. It is paramount for the survival of the totality of the financial system of a country and the banks in particular whose core function of financial intermediation depend on the availability of adequate liquidity.

In Nigeria, the challenges of inefficient liquidity management in banks were brought to the fore during the liquidation and distress era of 1980s and 1990s, which lingered up to the re-capitalization era in 2005 in which banks were mandated to increase their capital base from N2 billion to N25 billion. The recapitalization exercise was expected to stabilize and resolve the liquidity challenges that were prevalent in the economy. However, barely five years after what was applauded and considered as a fortified repositioning of banks against liquidity shortage, the Central Bank of Nigeria (CBN) in 2009 came on a rescue mission to save five illiquid banks. The CBN injected N620b to save the affected five banks that were operating on negative shareholder's funds, while the Asset Management Corporation of Nigeria (AMCON) was set up to buy the bad debts of affected banks (Agbada & Osuji, 2013).

Prudence requires that the liquidity position of a bank should be ascertained, monitored and controlled daily. The liquidity of an entity requires that its ability to pay its debts when due and the ability of its debtors to pay the amount they owe to the entity are of great importance. However, the liquidity or solvency of a firm is usually measured by liquidity ratios, which are a class of financial ratios used to determine a company's ability to honour its short-term debt obligations (Agbada & Osuji, 2013; Loth, 2012). Commonly used liquidity ratios are the current ratio and the quick ratio (also known as the acid test ratio). The current ratio is used to test a firm's liquidity because it shows the proportion of the firm's current assets available to cover its current liability. The concept behind this ratio is to ascertain whether a company's short-term assets (such as cash, cash equivalents, marketable securities, receivables and inventory) are sufficient to pay its short-term liabilities (notes payable, current portion of term debt, payables, accrued expenses and taxes). The only difference between the current and acid test ratios is

that inventory is omitted from the acid test ratio (Loth, 2012). In this study, we shall use the ratio of total loan-to-total deposit as a measure of the liquidity of the deposit money banks (Fadare, 2011).

Liquidity Management

The concept of liquidity management in a banking system is likened to the blood in the human system, adequate circulation of this blood in the body means the human system will function well resulting into good health. And the inadequacy will also mean that human system will be weak. Similarly, business can only operate under the state of adequate liquidity. A company is said to be liquid, if it can convert its asset to cash with minimum amount of delay and inconvenience. The optimum capital structure is determined by keeping in mind the long-term and short-term requirements of finance. This is in line with (Biety, 1998), who define liquidity as “the speed and ease with which an asset is sold and still realizes fair price”. Therefore liquidity is seen as the inflows and outflows of cash through the firm as product acquisition, sales payment and collection processes taking place over time, with which asset can be converted into cash without a significant loss of principal liquid asset. It is a relationship between the time dimension (how long it will take to sell) and the price dimension (The discount from fair market price) of an investment asset. Hence, a firm should ensure it does not suffer from lack of liquidity and does not also have excess liquidity. Failure to meet obligation due to lack of sufficient liquidity results in poor credit worthiness and loss of creditors' confidence. However, a high degree of liquidity results in idle cash. Thus, liquidity management as a concept encompasses efficient and effective planning and organization of Bank's assets which will enhance its liquidity and profitability at a minimum cost possible.

Liquidity management could be banking perform key and integral a part of the management of plus liability method. Most banking business depends on the flexibility of a bank to supply liquidity to their purchasers. Most of monetary transactions or commitments have the implications for liquidity. Banks are unit particularly susceptible to liquidity issues as at the extent specific establishment and in terms of general or markets. The supply of the deposits (which provides funding) adds to the volatility of the funds, as some creditor's area unit a lot of sensitive to promote events and credit than others. Diversification of funding supply's and deadlines permits a bank to avoid the vulnerability related to the concentration of funding from one management policies liquidity source. Bank ought to embrace a risk management (decision-making) the structure, management strategy liquidity and funding, variety of limits to exposure to liquidity risk, and a collection of procedures for liquidity coming up with beneath various eventualities, as well as crisis things.

Bank Performance

A general measure of how well a bank generates revenues from its capital. It also shows a bank's overall financial health over a period of time, and it helps to compare different banks across the banking industry at the same time (Nwaezeaku, 2016). As an individual bank, it would be important to start with its income statement for better understanding of how well it is operating, which describe the sources from income and expenses representing its profitability (Eljelli, 2004). Operating income is the income which is from bank's ongoing operation. Mostly, it comes from bank's interest with its assets, particularly loans. Meanwhile, noninterest income comes from partly service charges on deposit accounts, but mostly comes from the off-balance-sheet activities that create fees or profits for the bank (Anyanwu, 1993).

Operating expenses are expenses incurred as a result of bank's ongoing operations. Mostly, it is the interest payment for its liabilities, particularly with its deposits. Meanwhile, non-interest expenses cover the cost of its business running such as salaries, rent, equipment and cost of computer services, etc. Besides, an item named provision for loan losses played an important role within the financial crisis. When a bank has a bad debt or expected bad debt in the future, it needs to be written as a loss (Aburime, 2008).

Liquidity Management and Performance Bank

Liquidity simply means the ability of the bank to maintain sufficient funds to pay for its maturing obligations. It is the banks' ability to immediately meet cash, cheques, and other withdrawal obligations and legitimate new loan demand while abiding by existing reserve requirements. Liquidity management therefore is the strategic supply or withdrawal from the market circulation the amount of liquidity Consistent with desired level of short-term reserve money without distorting the profit making ability and operations of the bank (Aghada and Osuji, 2013). Generally, the adequacy of liquidity plays very crucial roles in the successful functioning of all business firms. The ability to meet short-term obligations may affect the firm's operations. Every investor has interest in the liquidity position of the company.

However, the issue of liquidity though important to other businesses, is most paramount to banking institutions and this explains why bank show-case cash and other liquid securities in their balance sheet statement. Thus, bank ensures that sufficient provision of cash and other near cash securities are made available to meet withdrawals obligation and new loan demand by customers in need of liquidity (Aghada and Osuji, 2013). Hence, banks in Nigeria are statutorily required to comply with Cash Reserve Requirement (CRR) policy of the Central Bank of Nigeria as a measure of effectively managing the liquidity position of banks.

Empirical Review

The effect of liquid asset holdings on the profitability of U.S. and Canadian banks was investigated by Bordeleau and Graham (2010). The empirical results from ordinary least squares regression analysis of panel data of the banks suggested that profitability is improved for banks that hold some liquid assets. However, there is a point at which holding -further liquid assets minimizes a bank's profitability, all else equal. Furthermore, the empirical results from the study also indicated that this relationship varies depending on a bank's business model and the state of the economy. Imad, Kilani and Kaddumi (2011) studied a balanced panel data set of Jordanian banks for the purpose of investigating the nature of the relationship between the profitability of banks and their liquidity level for ten banks over the period 2001 to 2010. Using two measures of bank's profitability: the rate of return on assets (ROA) and the rate of return on equity (ROE), the results showed that the Jordanian bank's liquidity explain a significant part of the variation in banks' profitability. High Jordanian bank profitability tends to be associated with well-capitalized banks, high lending activities, low credit risk, and the efficiency of credit management. Results also showed that the estimated effect of size did not support significant scale economies for Jordanian Banks.

Arif (2012) tested liquidity risk factors and assessed their impact on 22 banks in Pakistan between 2004 and 2009. Findings of the study indicated that there is a significant impact of liquidity risk factors on the banks dependence on the central bank in meeting the customers' obligations and profitability is negatively affected by the allocation of non-performing loans and liquidity gap. The relationship between liquidity and the profitability of banks listed on the Ghanaian Stock Exchange was investigated by Lartey, Antwi and Boadi (2013). The study was carried out on seven of the nine listed banks. The researchers made use of the longitudinal time dimension model. Specifically the panel method time series analysis and profitability ratios were computed from the annual financial reports of the seven banks. The trend in liquidity and profitability were determined by the use of time series analysis. It was revealed that for the period 2005 to 2010, both liquidity and profitability had a downward trend. The main liquidity ratio was regressed on the profitability ratio. The result revealed that there was a positive and statistically significant relationship between liquidity and profitability of the listed banks.

Almazari (2014) investigated the internal factors that have an effect on profitability in Saudi and Jordanian banks. He found that there is a positive correlation between profitability measured by ROA of Saudi and Jordanian banks with some liquidity indicators, as well as there is a negative correlation with other liquidity indicators between profitability measured by ROA of Saudi and Jordanian banks. Lipunga (2014) evaluated the determinants of profitability of listed commercial banks in developing countries specifically focusing on Malawi during the period

2009-2012 using internal-based and external (market)-based profitability measurements. The study employed correlation and multivariate regression analysis. Return on Assets (ROA) and Earnings Yield (EY) are used as proxies of internal and external profitability respectively. The results of the regression analysis suggest that bank size, liquidity and management efficiency have a statistically significant impact on ROA however capital adequacy has insignificant effect. On the other hand results suggest that earnings yield is significantly influenced by bank size, capital adequacy and management efficiency, whereas liquidity is found to have insignificant influence on Earnings yield.

Kurotamunobaraomi, Giami and Obari (2017) empirically investigated the interrelationship between liquidity and corporate performance of banks in Nigeria with the use of annual data from 1984 to 2014. The work utilized Cash Reserve Ratio, Liquidity Ratio and Loan-to-Deposit Ratio as proxies for liquidity; and Return on Shareholders' funds as the proxy for performance and applied finometric analyses that include Ordinary Least Square Regression, Johansen Cointegration, Granger Causality test and Error Correction Model. Empirical results indicate a significant negative short-run relationship between Cash Reserve Ratio and corporate performance as well as a positive relationship between Loan to Deposit Ratio and Liquidity Ratio on one hand and corporate performance on the other albeit significantly and insignificantly respectively. Also, Cash Reserve Ratio and Liquidity Ratio are statistically significant enough to influence Return on Shareholders' Fund in the long run, while the Loan-to-Deposit Ratio exhibits complacency in instigating Performance in deposit money banks in Nigeria; a position corroborated by the Causality results, implying that other factors could be responsible for banks' performance such as industry structure and government policies or regulations. Consequently, it is recommended that regulators such as the Central Bank of Nigeria may need to deliberately reconsider banks' capital reserves ratio as negative relationship found in this study points towards that direction in order to increase the corporate performance of banks, banks should avoid excess liquid assets, banks should fully utilize the loan to deposit ratio by increasing marketing effort.

Daniel (2017) impact of liquidity management on the performance of deposit money banks, twenty four banks were surveyed which constitute the entire deposit money banking industry in Nigeria between 1986 and 2011. Secondary data were collected and analysed using SPSS. The study uses descriptive, correlations and inferential statistics. Bank performance in terms of profitability is measured by its return on equity. Three hypotheses are formulated and statistically tested at 5 per cent level of significance using Multiple Linear Regression Analysis. Findings from the empirical analysis show that there is a significant relationship between liquidity management and the performance of Deposit Money Banks in Nigeria. The correlation

results reveal positive impacts between return on equity and liquidity management variables: liquidity and cash reserve ratios, whereas loan to deposit ratio shows negative impact. However, the key results indicate that only the banks with optimum liquidity were able to maximize returns. The study concludes that illiquidity and excess liquidity pose problem to bank management operations and recommends that bank should adopt optimum liquidity model for efficiency and effectiveness.

Akinwumi, Essien and Adegboyega (2017) examined the liquidity management on profitability of banks in Nigeria between 2007 and 2016, using Pearson correlation coefficient technique. The empirical results revealed that there is a statistically significant relationship between banks' liquidity, return on asset and return on equity. However, the relationship is not all that statistically significant when return on asset was used as proxy for profitability. It was suggested that the banks should evaluate and redesign their liquidity management strategy so that it will optimize returns to shareholders equity and also optimize the use of the assets. The study showed that good management and control of factors influencing the liquidity of commercial banks in the country could improve the financial performance of banks.

Olagunju, Adeyanju and Olabode (2011) examined liquidity management and commercial banks' profitability in Nigeria by analyzing both primary and secondary data. The results indicate that the profitability of commercial banks is significantly influenced by their liquidity and vice versa. Fadare (2011) employed a linear least square model and time series data from 1980 to 2009 to examine the determinants of Banking Sector liquidity in Nigeria and assesses the extent to which the recent financial crises affected liquidity in deposit money banks in the country. The findings indicate that only liquidity ratio, monetary policy rate and lagged loan-to-deposit ratio are significant for predicting Banking Sector liquidity; and that a decrease in monetary policy rates, liquidity ratios, volatility of output in relation to trend output, and the demand for cash, leads to an increase in current loan-to-deposit ratios; while a decrease in currency in circulation in proportion to Banking Sector deposits; and lagged loan-to-deposit ratios leads to a decline in current loan-to-deposit ratios. The result suggests that during periods of economic or financial crises, deposit money banks are significantly illiquid relative to benchmarks, and getting liquidity monetary policies right during these periods is crucial in ensuring the survival of the Banking Sector.

Kolapo, Ayeni and Oke (2012) carried out an empirical investigation into the quantitative effect of credit risk on the performance of commercial banks in Nigeria over the period of 11 years (2000-2010) using five commercial banking firms. Panel model analysis was used to estimate the determinants of the profit function. The results showed that the effect of credit risk

on bank performance measured by the Return on Assets of banks is cross-sectional invariant. That is the effect is similar across banks in Nigeria, though the degree to which individual banks are affected is not captured by the method of analysis employed in the study.

Adegbaju and Olokoyo (2008) investigated the impact of previous recapitalization in the banking system on the performance of the banks in Nigeria with the aim of finding out if the recapitalization is of any benefit. The study employed secondary data obtained from NDIC annual reports. The results indicate that the mean of key profitability ratios such as the Yield on earning asset (YEA), Return on Equity (ROE) and Return on Asset (ROA) were significant meaning that there is statistical difference between the mean of the bank before 2001 recapitalization and after 2001 recapitalization. Osamor, Akinlabi and Osamor (2013) examined the impact of globalization on performance of Nigerian commercial banks between 2005 and 2010, using panel data econometrics in a pooled regression, where time series and cross-sectional observations were combined and estimated. The results of econometric panel regression analysis confirmed that globalization, i.e. foreign private investment, foreign trade and exchange rate have positive effects on the profit after tax of banks.

Olokoyo (2012) examined the effects of bank deregulation on bank performance in Nigeria. The study analyzed secondary data collected from CBN statistical bulletin by employing the Ordinary Least Square (OLS) technique. This study found out that the deregulation of the banking sector has positive and significant effect on bank performance. Dahiyat (2016) examined the impact of liquidity and solvency on banks profitability. All banks listed in Amman exchange were selected (15 banks) for the period 2012-2014. To measure the liquidity the quick ratio was calculated, Debt ratio was calculated to measure the solvency, whereas return on assets ratio was calculated to measure the profitability. Simple regression was used to examine the relations; the results showed that the liquidity has a negative (inverse) significant impact on profitability, whereas the solvency has a no impact on profitability.

RESEARCH METHOD

Theoretical Framework

This study is underpinned by Liability management theory which focuses on the liability side of the balance sheet for supplemental liquidity. Developed in the micro electric revolution, the liability management theory argues that since large banks can buy all the funds they need, there is no need to store liquidity on the asset side of the balance sheet. Focusing on the liability side, it assumes that increasing the interest rate offered, for funds will pluck increase in supply and provide for liquidity needs. In this way, the theory assumes stable normal situations and

unshaken confidence of the market on the credit worthiness, viability and integrity of the borrowing bank (Nwakwo, 1999).

Model Specification

In specifying mathematical models, the study relied on the theories of the link between liquidity risk and profitability. More so, the model as used by Saleen *et al*, (2011) and Agbada and Osuji (2013) were adopted

$$PAT = F (CRR_t, LTA_t, LAD_t) \text{ --- --- --- --- --- } 1$$

The model was augmented with the inclusion of cash to total deposit ratio and loan and advance to deposit ratio as well as ROA which is proxied for bank performance. The inclusion of the variables in the model is because they represent macro determinant variables to express the effect of liquidity risk on financial performance of bank. The mathematical representations of the functional form that represent the stated hypotheses are expressed as follows:

$$ROA = F (CRR_t, LTA_t, LAD_t, CTD_t, LNA_t) \text{ --- --- --- --- --- } 2$$

where:

ROA = Return on asset

CRR_t = Current ratio i.e. current asset to current liability

LTA_t = Liquid assets to total asset ratio

LAD_t = Loans and advances to deposits ratio

CTD_t = Cash to total deposits ratio

LNA_t = Loans and advances to total assets ratio

Equation (1) is a mere mathematical expression that cannot be estimated in its present forms. Thus, to make it adaptable for regression analysis and estimation, equations (1) is expressed linearly as follows:

$$ROA = \alpha_0 + \alpha_1 CRR_t + \alpha_2 LTA_t + \alpha_3 LAD_t + \alpha_4 CTD_t + \alpha_5 LNA_t + U_t \text{ --- --- --- --- } 3$$

Where, $\alpha_0 - \alpha_5$ are variables coefficients which were estimated. U_t is the stochastic element representing all other unspecified influence on return on asset.

Source of Data

The data were secondary sourced from the Zenith Bank, First Bank, Access Bank, United Bank of Africa and Eco Bank financial statement of account respectively. The data were obtained from 2013 to 2017 which is a period of 5 years on each of the banks. The rationale for the selection of the banks and years was informed by the availability of financial data online and in-prints.

Estimation Technique

This study adopts the pool regression of ordinary least square method of multiple regression analysis. This is based on the various desirable of the ordinary least square which many other estimation techniques do not possess. These include the properties of Best, Linearity, Unbiasedness and Efficiency (BLUE). Some of these desirable properties are summarized in the BLUE properties of OLS. In the same vein, the t-test statistic, co-efficient of multiple determination R^2 , f-test, Durbin Watson test for considered in the analysis appropriately.

ANALYSIS AND RESULTS

The table 1 shows the regression of the ordinary least square results conducted on the specified model with E-view 7.0. The OLS results revealed the relationship that exists between the dependent variable and each of the independent variable.

Table 1: Summary of OLS Result (*Eview 7 output*)

Variables	Co-efficient	Standard error	t-statistics	Probability
C (ROA)	8.441420	13.27155	0.636054	0.5323
CRR	4.798524	10.74184	0.446714	0.6601
LTA	6.426835	5.312453	1.209768	0.2412
LAD	31.55341	6.744162	4.678626	0.0002
CTD	4.912274	5.795343	0.847624	0.4072
LNA	-31.43285	8.147206	-3.858115	0.0011

$R^2 = 0.596933$ Adj $R^2 = 0.490862$ **D.W.** = 2.558034
N = 25 **F-stat** = 5.627704 Prob = 0.002395

The relationship between the dependent variable (ROA) and the independent variables (CRR, LTA, LAD, CTD, and LNA) in the table 1, this can be expressed mathematically as:

$$ROA = 8.441420 + 4.798524CRR + 6.426835LTA + 31.55341LAD + 0.470218CTD - 31.43285LNA + \mu$$

An examination of the results of the pool OLS in table 1 showed that if all the explanatory variables are held constant the selected banks (Zenith Bank, First Bank, Access Bank, United Bank of Africa and Eco Bank) ROE will be positively increased by 8.441420 units. The coefficient of CRR which is estimated to be (4.798524) is insignificant and positively related to ROA. This implied that an increase in the CRR will lead to an increase in ROA by 4.798524 unit. Liquid asset to total asset ratio (LTA) which have a positive slope co-efficient of 6.426835 is not statistically significant at 5% level of significance. However, the result implied that a unit

increase in LTA will lead to a 6.426835 unit increase in ROA of the selected banks (Zenith Bank, First Bank, Access Bank, United Bank of Africa and Eco Bank). Loan and advances to deposit ratio (LAD) is positive and statistically significant with ROA. The result implied that 1% change in the level of LAD will decrease ROA of the selected banks (Zenith Bank, First Bank, Access Bank, United Bank of Africa and Eco Bank) by 31.5%. The significant effect of loan and advances to deposit ratio implies that the most credible asset and tool to enhancing the performance of banks in the Nigeria economy is by giving out loans and advances.

The coefficient of CTD is estimated to be 0.470218. This implies that a unit increase in CTD will lead to 0.470218 unit increase in ROA of the selected banks (Zenith Bank, First Bank, Access Bank, United Bank of Africa and Eco Bank). Lastly, loan and advances to total asset (LNA) is negatively and statistically significant with an estimated coefficient of 31.43285. This means that a unit increase in LNA will lead decrease estimated to be 31.43285 unit in ROA of the selected banks (Zenith Bank, First Bank, Access Bank, United Bank of Africa and Eco Bank). Their significant value is also taken into consideration with their probability value.

The coefficient of multiple determinations (R^2) as given in the result of the pool regression of the ordinary least square of e-view 7.0 is given as 0.596933 from the result which implies 59% with an adjusted R^2 of 0.490862, which implies 49%. Therefore, the result of OLS explained that the explanatory variables (CRR, LTA, LAD, CTD, and LNA) accounted for 59% behavior of the dependent variable (ROA), while the remaining 41% is accounted for by the stochastic variable. The study also revealed that only LNA and LAD were significantly related to ROA while CRR, LTA and CTD were insignificant. Nevertheless, the overall F-stat is significant at 5% implying that the model is statistically significant. The autocorrelation is greater than 2 which signifies that the model is free from presence of serial autocorrelation.

CONCLUSION

The high number of illiquid banks in the Nigerian banking industry as seen in recent times appears to attest to the fact that most bank management in Nigeria do not either place emphasis on strategic liquidity management or are deficient in it. Even though they may be efficient, most businesses in the Nigerian economy are transacted purely on cash basis such that managing liquidity effectively becomes cumbersome. Effective liquidity management creates good public confidence in the financial system of a country and good public confidence prevents a 'run' on the banking system and consequently on the liquidity state of banks.

Astute bank management entails delicate balancing of the liquidity and profitability trade-off. This is because excessive liquidity reduces profitability while excessive liquidity risks exposure, in pursuit of maximum profitability it could lead to the insolvency of a bank. This study

was carried out to empirically examine the effect of liquidity management on profitability of Deposit Money Banks in Nigeria. The empirical results indicated that liquidity management has significant effect on performance of Deposit Money Banks in Nigeria. Thus, the liquidity management of DMBs in Nigeria maximizes returns to shareholders but is producing less than optimal profitability in terms of efficient utilization of assets. Hence, this study is in consistent with Bassey and Moses (2015) who found a significant relationship between liquidity management and performance of Deposit Money Banks in Nigeria.

RECOMMENDATIONS

Based on the critical evaluation of the findings, made in this study, the study proffer the following recommendations with the sincere conviction that they will help to reduce if not totally eradicate the problems associated with liquidity management and profitability in deposit money banks in Nigeria

- i. Management should learn the act of outsourcing the banks' surplus total assets in such a way that earnings on total assets can be maximized
- ii. Banks are advised to continue using assets, limiting purchases of inventory and increase sales without purchasing new assets.
- iii. The liquidity management of Deposit Money Banks should be more proactive than reactive as it is presently practiced. The current conservative approach of keeping to a tight liquidity management, although producing good profitability in terms of return on equity, but only produces modest profitability.

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