EFFECT OF LIQUIDITY MANAGEMENT ON PERFORMANCE OF DEPOSIT MONEY BANKS IN NIGERIA (2000-2015)

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Abstract

The issue of the conflicting interest between liquidity and profitability of banks has always been a lingering issue in the Nigerian banking system. The broad objective of this study was to assess the effects of liquidity management on performance of deposit money banks (DMBs) in Nigeria. Four specific objectives were made from the broad objective which includes: to determine the relationship between liquidity ratio and profitability, to ascertain the relationship between cash to deposit ratio and profitability among others. To address the objectives, research questions and stated hypotheses, relevant data were gathered from CBN and NDIC annual publications for 16 years covering 2000-2015. The data were presented in tables and based on the models specified; the hypotheses were tested using regression analysis by employing a statistical package E-view 8.0. The result of the OLS showed that there is a negative and significant relationship between liquidity ratio and DMBs’ profitability and there is a positive and significant relationship between cash to deposit ratio and profitability of the DMBs. In line with these findings, it is recommended that instead of keeping excessive liquidity as a provision of unexpected deposit withdrawals from the customers, the DMBs should find it reasonable to adopt other measures of meeting such requirements which can include borrowing and discounting bills and also that there is a need to invest the excess of liquidity available at in available investments with various degrees of liquidity in order to increase the banks’ profitability and to get benefits from the time value of the available money.

1.0 Introduction

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. Liquidity management therefore involves the strategic supply or withdrawal from the market or circulation the amount of liquidity consistent with a desired level of short-term reserve money without distorting the profit making ability and operations of the bank. It relies on the daily assessment of the liquidity conditions in the banking system, so as to determine its liquidity needs and thus the volume of liquidity to allot or withdraw from the market.
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. While Central bank liquidity management has short-term effects in financial markets, its long-term implications for the real sector and on price level are more profound. 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. Strategic bank management aims prominently at keeping the bank solvent and liquid in order to earn good profits and remain sound. 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. The negative cumulative effects of banking system liquidity crisis from the 1980s and 1990s lingered up to the re-capitalization era in 2005 in which banks were mandated to increase their capital base from N2 billion to an astronomical high N25 billion. This move by the apex bank was believed would stabilize and rectify liquidity problems that were prevalent in the economy. Barely five years of what was applauded and considered as a fortified repositioning of banks against liquidity shortage, Central Bank of Nigeria (CBN) in 2009 came on a rescue mission to save three illiquid banks (the defunct Afribank, Bank PHB, and Spring bank). The global financial crisis of 2008 also had its claws on the already ailing banks and to contain the crisis of confidence and ease financial conditions, CBN used both conventional and unconventional measures to inject liquidity into the system. In its rescue mission in 2009, CBN injected N620b to save the affected three banks that were operating on negative shareholder’s funds (Okpara, 2013). The use of unconventional measures became necessary as the regular monetary policy transmission mechanism got seriously impaired by the liquidity crisis that warranted the setting up an agency, Asset Management Corporation of Nigeria (AMCON) in 2011 to buy out the bad debts of affected banks (Okpara, 2013).

However, there is a serious liquidity problem still rocking the Nigerian banking industry. After the election of 2015, in which the ruling party lost to a new government, there has been rumours of some politicians who borrowed money from the banks to support their campaigns not being able to pay back (most recent is the case of Ayo Fayose & Zenith bank plc), and the introduction of treasury single account (TSA), in which the presidency mandated that all public sector funds should be withdrawn from the deposit money banks, thereby leaving the banks illiquid, given that the public sector deposit constitute about 75% of the banks’ deposit.

On the other hand, like all businesses, banks profit by earning more money than what they pay in expenses. The major portion of a bank’s profit comes from the fees that it charges for its services and the interest that it earns on its assets. Its major expense is the interest paid on its liabilities. The major assets of a bank are its loans to individuals, businesses, and other organizations and the securities that it holds, while its major liabilities are its deposits and the money that it borrows, either from other banks or by selling commercial paper in the money market. The bank profitability can be determined through various ratios, which include: return on asset, return on equity, net interest margin, profit before tax, yield on earning assets, etc.
From the foregoing, it is obvious that banks need huge amount of money to be able to effectively provide the required intermediary services, in order to improve their level of profit and also ensure that the customers have their money available for withdrawal when needed. These two functions are very contradictory in nature, and hence needs to be given thorough attention. Through the financial intermediation role, the Deposit money banks reactivate the idle funds borrowed from the lenders by investing such funds in different classes of portfolios. Such business activity of the bank is not without problems since the deposits from these fund savers which have been invested by the banks for profit maximization, can be recalled or demanded when the latter is not in position to meet their financial obligations. Considering the public loss of confidence as a result of bank distress which has bedeviled the financial sector in the last decade; and the intensity of competition in the banking sector due to the emergence of large number of new Deposit money banks. The Deposit money banks therefore strive to make profit and at the same time meets the financial demands of its depositors by maintaining adequate liquidity.

The problem then becomes how to select or identify the optimum point or the level at which the DMBs can maintain its assets in order to optimize these two objectives. This problem becomes more pronounced as good number of DMBs are engrossed with profit maximization and as such neglecting the importance of liquidity management in banking. However, the profit maximization becomes a myth as the resulted liquidity can lead to both technical and legal insolvency with the consequence of low patronage, deposit flight, erosion of asset base. It is against this backdrop, this article seek to explore the effects of liquidity management on the performance of deposit money banks (DMBs) in Nigeria from 2000-2015. Specifically, the study will determine the relationship between liquidity ratio and the profitability of DMBs; ascertain the relationship between cash to deposit ratio and profitability of DMBs; determine the relationship between loan to deposit ratio and profitability of DMBs and determine the relationship between loan to asset ratio and profitability of DMBs in Nigeria.

The study will find answers to the following lingering questions: - What is the extent of relationship between liquidity ratio and profitability of the deposit money banks in Nigeria?; what is the nature of relationship between cash to deposit ratio and profitability of the deposit money banks in Nigeria?; and what is the degree of relationship between loan to deposit ratio and profitability of the deposit money banks in Nigeria?

From the research questions, the four hypotheses are deduced as follows:

Ho 1: There is no significant relationship between liquidity ratio and profitability of the deposit money banks in Nigeria. Ho2: There is no significant relationship between cash to deposit ratio and profitability of the deposit money banks in Nigeria. Ho3: There is no significant relationship between loan to deposit ratio and profitability of the deposit money banks in Nigeria.

2.0 Review of Related Literature

Conceptual Framework

The Concept of Liquidity: According to business dictionary, liquidity is a measure of the extent to which a person or organization has cash to meet immediate and short-term obligations or assets that can be quickly converted to do this. Liquidity can also be a measure of the ability and ease with which assets can be converted to cash. Liquid assets are those that can be converted to cash quickly if needed to meet financial obligations; examples of liquid assets generally include cash, central bank reserves and government debt. To remain viable, a financial institution must have enough liquid assets to meet its short term obligations, such as withdrawals by depositors.
According to Graham (2013), liquidity can further be termed as a bank’s capacity to fund increase in assets and meet both expected and unexpected cash and collateral obligations at a reasonable cost and without incurring unacceptable losses. Also, liquidity is a financial term that means the amount of capital that is available for investment. Today, most of this capital is credit, not cash. 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. According to Nwaezeaku (2006), liquidity in banking measures the availability of cash and the rate at which current assets are converted into cash to meet ordinary and extra – ordinary request. Several scholars have viewed liquidity as a measure of bank’s bargaining power and strength. One of the views is that, the more effective a deposit money bank is in managing its liquidity, the stronger its ability to provide loanable funds. Adequate liquidity enables a bank to meet three risks namely: Time risk (which is the ability to compensate for non-repayment of funds. That is, if the borrower defaults their commitment at a specific time), funding risk (which signifies the ability to replace net out flows of funds, either via usual withdrawals of retail deposits or non-renewal of wholesale funds), lending risk (which denotes ability to meet occasional withdrawals of funds from cogent customers). Monitoring deposit money banks’ liquidity reduces the possibility of raising loans under unfavourable loan agreements, restrictions and at a high interest bearing costs.

Liquidity management in deposit money banks also reduces the incidence of bankruptcy and liquidation which are simply the result of illiquidity, and thereby, help to protect customers’ deposits. To simply conclude, liquidity helps to enhance and maintain public confidence of depositors and the financial markets. If the financial market perceives a bank to have liquidity problems, the bank may not be permitted to raise further funds and if allowed, it will be at an increased rate (premium). Also, liquidity monitoring also serves as a tool through which over-liquidity and under-liquidity, which can pose negative impact on profitability can be avoided (Ayo, 2014).

The Concept of Banks Profitability and Efficiency

Bank profitability is the ability of a bank to generate revenue in excess of cost, in relation to the bank’s capital base. A sound and profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system. (Brissimis, Athanasoglou, & Delis, 2005). Profitability in general is a relationship between the profits generated by the enterprise and investments that contributed to the achievement of these profits, and profitability ratios measure the efficiency with which a company turns business activity into profits. Profit margins assess the ability to turn revenue into profits. Return on assets measures the ability to use assets to produce net income. Return on equity compares the net income to shareholder equity (Briand, 2010).

It is inevitable that banks continue to attract significant attention from the public and scrutiny by financial regulators as there is a growing need to evaluate banks in a more efficient manner. Not only supervising institutions, regulators and bank management bodies, but also clients of banks, are becoming increasingly concerned about the stability and sustainability of these financial institutions (Lovren, 2014).

There are other reasons to evaluate the profitability of banks — to determine their operational results and their overall financial condition; measure their assets quality, management quality and efficiency, and achievement of their objectives; as well as ascertain their earning quality, liquidity, capital adequacy, and level of bank services.

The concept of measuring efficiency was first discussed in 1951 by Koopmans and Debreu. Later in 1957, it was followed by Farrell who empirically measured efficiency. Hollingsworth and Parkin
(2009) defined efficiency as “the allocation of scarce resources that maximizes the achievement of aims” (as cited in Bdour & Al-khoury, 2010). Farrell classified efficiency into two components (Kumbhakar & Lovell, 2013). First is technical efficiency (TE). According to Kumbhakar and Lovell, technical efficiency is achieved when the firm is able to produce a maximum level of outputs given a certain level of inputs or minimise inputs given a certain level of outputs. Specifically, according to Koopmans (1951) “a producer is technically efficient if it is impossible to produce more of an output without producing less of some other outputs or using more of some inputs”. In other words, there is no wastage incurred in its production. Second is allocative efficiency (AE). It refers to the optimal combination of inputs and outputs at a given price. Allocative efficiency is also known as economic efficiency. The aim of the producer might include such objectives: to produce given outputs at minimum costs (cost efficiency); to use given inputs to maximize revenue (revenue efficiency); and to allocate inputs and outputs in order to maximize profit (profit efficiency) (Mokhtar., 2010). On the other hand, the cost and profit efficiency are regarded by Berger and Mester (2007) as the most important economic efficiency concepts. Accordingly, based on Farrell’s concept, the combination of the two components will create overall economic efficiency (OE).

Liquidity is the ability of a company to meet its short term obligations. It is the ability of the company to convert its assets into cash. Short term, generally, signifies obligations which mature within one accounting year. Short term also reflects the operating cycle: buying, manufacturing, selling, and collecting (Agu, 2012). A company that cannot pay its creditors on time and continue to fail its obligations to the suppliers of credit, services, and goods can be declared a sick company or bankrupt company. Inability to meet the short term liabilities may affect the company’s operations and in many cases it may affect its reputation too. Lack of cash or liquid assets on hand may force a company to miss the incentives given by the suppliers of credit, services, and goods. Loss of such incentives may result in higher cost of goods which in turn affect the profitability of the business. So there is always a need for the company to maintain a certain degree of liquidity. However, there is no standard norm for liquidity. It depends on the nature of the business, scale of operations, location of the business and many other factors.

According to Okoro (2010), every stakeholder has interest in the liquidity position of a company. Supplier of goods will check the liquidity of the company before selling goods on credit. Employees also have interest in the liquidity to know whether the company can meet its employees’ related obligations: salary, pension, provident fund etc. Shareholders are interested in understanding the liquidity due to its huge impact on the profitability. Shareholders may not like high liquidity as profitability and liquidity are inversely related. However, shareholders are also aware that non-liquidity will deprive the company from getting incentives from the suppliers, creditors, and bankers.

Theoretical Framework
There are a number of liquidity management theories; Anticipated Income Theory, Shiftability Theory, Liability Management Theory and Commercial Loan Theory. However, this study adopts the commercial loan theory as the major theory which it hinged on.

Commercial Loan Theory
This theory states that the liquidity of the commercial bank achieved automatically through self-liquidation of the loan, which being granted for short periods and to finance the working capital, where borrowers refund the borrowed funds after completion of their trade cycles successfully. According to this theory, the banks do not lend money for the purposes of purchasing real estate or consumer goods or for investing in stocks and bonds, due to the length of the expected payback
period of these investments, where this theory is proper for traders who need to finance their specific trading transactions and for short periods (Emmanuel, 2011).

**Empirical Review**

The effect of liquidity management on banks' profitability has been studied by a number of researchers; here is some review of them.

Adebayo (2011) examined liquidity management and commercial banks’ profitability in Nigeria. Findings of this study indicate that there is significant relationship between liquidity and profitability. That means profitability in commercial banks is significantly influenced by liquidity and vice versa.

Saleem and Rehman (2011) sought to reveal the relationship between liquidity and profitability. The main results of the study demonstrate that each ratio (variable) has a significant effect on the financial positions of enterprises with differing amounts and that along with the liquidity ratios in the first place. Profitability ratios also play an important role in the financial positions of enterprises.

Arif (2012) tested liquidity risk factors and assessed their impact on (22) of Pakistani banks during the period (2004-2009). Findings of the study indicate that there is a significant impact of liquidity risk factors on the banks profitability, where an increase in deposits lead to increasing in the bank’s profitability in terms of reducing 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.

Agbada and Osuji (2013) examined empirically the effect of efficient liquidity management on banking performance in Nigeria. Findings from the empirical analysis were quite robust and clearly indicate that there is significant relationship between efficient liquidity management and banking performance and that efficient liquidity management enhances the soundness of bank.

Ibe (2013) examined the effect of liquidity management on the profitability of banks in Nigeria. He found that liquidity management is indeed a critical issue in the banking sector of Nigeria.

Lartey (2013) sought to find out the relationship between the liquidity and the profitability of banks listed on the Ghana Stock Exchange. It was found that for the period 2005-2010, both the liquidity and the profitability of the listed banks were declining. Again, it was also found that there was a very weak positive relationship between the liquidity and the profitability of the listed banks in Ghana.

Moein-Addin (2013) investigated the relationship between modern liquidity indices and stock return in companies listed on Tehran Stock Exchange. Results indicated that there was a positive and significant relationship between comprehensive liquidity index and stock returns while there was no significant relationship between the index of cash conversion cycle as well as net liquidity balance and sock returns.

Maaka (2013) in their research sought to establish the relationship between liquidity risk and financial performance of commercial banks in Kenya. The study adopted correlation research design where data was retrieved from the balance sheets, income statements and notes of thirty-three (33) Kenyan banks during 2008-2012. Multiple regressions was employed to assess the impact of liquidity risk on banks’ profitability and the findings were that profitability of the commercial bank in Kenya is negatively affected due to increase in the liquidity gap and leverage. With a significant liquidity gap, the banks may have to borrow from the market even at a higher rate thereby pushing up the cost of banks. The level of customer deposit was also found to positively affect the bank’s profitability and it will therefore be encouraged for banks to open more branches in the country.
In the study of the determinants of liquidity and their impact on financial performance in Nepalese commercial banks by Sushil and Bivab (2013), the results of regression analysis showed that capital adequacy, bank size, share of non-performing loans in the total volume of loans and liquidity premium paid by borrowers has negative and statistically significant impact on banks’ liquidity. Growth rate of gross domestic product on the basis price level, short term interest rate and inflation rate has negative and statistically insignificant impact on banks’ liquidity. And, loan growth rate has positive and statistically insignificant impact on banks liquidity. Among the statistically significant factors affecting banks liquidity capital adequacy, bank size and growth rate of gross domestic product on the basis price level had negative impact on financial performance whereas, liquidity premium paid by borrowers had positive impact on financial performance. In all, the impact of bank liquidity on financial performance was non-linear. Results suggest that profitability is improved for banks that hold some liquid assets, however, there is a point at which holding further liquid assets diminishes a banks’ profitability, ceteris paribus.

Heibati (2009) examined and compared the performance of private banks in Iran and Arabic countries of Persian Gulf area. The empirical results from regression analysis of cross-country panel data of the banks showed statistically significant relationship between liquidity and profitability of the banks especially during initial years of their activity. The effect of liquid asset holdings on the profitability of U.S. and Canadian banks was investigated by Bordeleau (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 (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.

The relationship between liquidity and the profitability of banks listed on the Ghanaian Stock Exchange was investigated by Larvey 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. When 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.

Obiakor and Okwu (2011), examined the nature and extent of the relationship between liquidity and profitability of Nigerian banks. A model of perceived functional relationship was specified and estimated using correlation and regression analysis. The results indicated that a trade-off existed between liquidity and profitability in the banks.

Uremadu (2012) carried out a study on the effect of capital structure and liquidity on the profitability of selected Nigerians banks. Time series data for the 1980 to 2006 period was used.
for the study. The data was analyzed using descriptive statistics and regressive distributed lag (ARDL) model. The empirical results indicated a positive and significant relationship between cash reserve ratio, liquidity ratio, corporate income tax and banks’ profitability. On the other hand, there was negative and significant relationship between savings deposit rate, gross national savings, balances with the central bank, inflation rate, foreign private investment and bank profitability.

Ibe (2013) investigated that impact of liquidity management on the profitability of banks in Nigeria. Three banks were randomly selected to represent the entire banking industry in Nigeria. The proxies for liquidity management include cash and short-term fund, bank balances and treasury bills and certificates, while profit after tax was the proxy for profitability. Elliot Rosenberg Stock (ERS) stationary test model was used to test the association of the variables under study, while regression analysis was used to test the hypothesis. The result showed that there is a statistically significant relationship between the variables of liquidity management and profitability of the selected banks.

The study by Kehinde (2013) critically examined the relationship between credit management, liquidity position and profitability of selected banks in Nigeria using annual data of ten banks over the period of 2006 and 2010. The results from ordinary least squares estimate found that liquidity has significant positive effect on Return on Asset (ROA).

3.0 Methodology
This study is ex-post facto research design. The study extensively made use of Ordinary Least Square Regression Analysis to explore the nature of the relationship or the extent of association between liquidity management and bank performance. The choice of ordinary least square was chosen due to its simplicity, as well as its BLUE (Best Linear Unbiased Estimator) property. This was to enable the researcher measure quantitatively and qualitatively the effect of liquidity management on the performance of deposit money banks in Nigeria within the period under review.

The Ordinary Least Square (OLS) method was adopted for the analysis because the alternative econometric techniques such as Two Stage Least Squares (2SLS) give limited information. The computer software application E-Views 8.0 was used for the analysis.

Model Specification
The study adapted five models to enable the researcher to be able to significantly take care of the five specific objectives of this study. However, the researcher adopted a model by Adeniyi (2010), which is expressed as below with slight modification.

The adapted model was expressed as: $\text{ROA} = f(\text{NPL}, \text{LR}, \text{CDR})$ ——— 3.1 However, the modified models are expresses below as:

$\text{ROA} = f(\text{LR})$ ——— 3.2; $\text{ROA} = B_0 + B_1 \text{LR} + \text{ut} \quad$——— 3.3; $\text{ROE} = f(\text{CDR}) \quad$——— 3.4; $\text{ROE} = B_0 + B_2 \text{CDR} + \text{ut} \quad$——— 3.5; $\text{NIM} = f(\text{LDR}) \quad$——— 3.6; $\text{NIM} = B_0 + B_3 \text{LDR} + \text{ut} \quad$——— 3.7; $\text{ROA} = f(\text{LTAR}) \quad$——— 3.8; $\text{ROA} = B_0 + B_4 \text{LTAR} + \text{ut} \quad$——— 3.9.

Where: $\text{LR} = \text{Liquidity Ratio}; \text{LDR} = \text{Loan To Deposit Ratio}; \text{AU} = \text{Asset Utilization}; \text{CDR} = \text{Cash To Deposit Ratio}; \text{ROA} = \text{Return on Assets}; \text{ROE} = \text{Return on Equity}; \text{NIM} = \text{Net Interest Margin}; \text{LTAR} = \text{Loan To Asset Ratio}; F = \text{Functional Relationship}; B_0 = \text{Slope of the Regression Line}; B_1 – B_5 = \text{Estimate Parameters}; \text{Ut} = \text{Error Term}.$
4.0 Data Presentation and Analysis

Table 4.1: Table for analyzing the effect of liquidity on the performance of deposit money banks in Nigeria (2000 – 2015)

<table>
<thead>
<tr>
<th>Year</th>
<th>ROA</th>
<th>ROE</th>
<th>NIM</th>
<th>LR</th>
<th>LDR</th>
<th>LTAR</th>
<th>TA</th>
<th>CDR</th>
<th>AU</th>
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<td>64.1</td>
<td>1.23</td>
<td>9.4</td>
<td>46.2</td>
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<td>6.42</td>
<td>52.9</td>
<td>1.35</td>
<td>12.0</td>
<td>52.9</td>
<td>1.92</td>
<td>6.35</td>
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<td>4.47</td>
<td>52.5</td>
<td>7.4</td>
<td>123</td>
<td>78.4</td>
<td>3.2</td>
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<td>27.23</td>
<td>9.85</td>
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<td>11.6</td>
<td>85.4</td>
<td>2.1</td>
<td>4.12</td>
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<tr>
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<td>4.81</td>
<td>8.35</td>
<td>50.2</td>
<td>7.8</td>
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<td>19.1</td>
<td>97.5</td>
<td>3.3</td>
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<tr>
<td>2007</td>
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<td>36.83</td>
<td>18.27</td>
<td>48.8</td>
<td>7.8</td>
<td>48.3</td>
<td>48.8</td>
<td>3.6</td>
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<td>2008</td>
<td>4.29</td>
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<td>44.3</td>
<td>8.9</td>
<td>97.0</td>
<td>44.3</td>
<td>3.9</td>
<td>27.18</td>
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<tr>
<td>2009</td>
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<td>40.9</td>
<td>7.8</td>
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<td>30.5</td>
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<td>78.9</td>
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<td>99.7</td>
<td>30.0</td>
<td>1.1</td>
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</tr>
<tr>
<td>2014</td>
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<td>13.2</td>
<td>30.0</td>
<td>6.1</td>
<td>99.9</td>
<td>30.0</td>
<td>1.56</td>
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<tr>
<td>2015</td>
<td>2.91</td>
<td>23.7</td>
<td>11.1</td>
<td>30.0</td>
<td>6.2</td>
<td>98.5</td>
<td>30.0</td>
<td>2.12</td>
<td>74.37</td>
</tr>
</tbody>
</table>

Source: CBN publications for various years

KEY: Return on asset (ROA), Return on equity (ROE), Net interest margin (NIM), Total deposit (TD), Loans and advance (LAD), liquidity ratio (LR), loan to deposit ratio (LDR), Loan to total asset ratio (LTAR), asset utilization (AU) and cash to deposit ratio (CDR).

Hypothesis one
Ho: There is no significant relationship between liquidity ratio and profitability of the deposit money banks in Nigeria.
Hi: There is a significant relationship between liquidity ratio and profitability of the deposit money banks in Nigeria.
Table 4.2: relationship between ROA and LR
Dependent Variable: ROA
Method: Least Squares
Date: 09/18/16   Time: 02:10
Sample: 2000 2015
Included observations: 16

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-5.347069</td>
<td>1.702750</td>
<td>-0.319657</td>
<td>0.7539</td>
</tr>
<tr>
<td>LIQR</td>
<td>-0.090417</td>
<td>0.376404</td>
<td>0.240212</td>
<td>0.8136</td>
</tr>
</tbody>
</table>

R-squared 0.004105  Mean dependent var -1.468750
Adjusted R-squared -0.067031  S.D. dependent var 16.93948
S.E. of regression 17.49800  Akaike info criterion 8.678519
Sum squared resid 4286.522  Schwarz criterion 8.775093
Log likelihood -67.42815  Hannan-Quinn criter. 8.683465
F-statistic 0.057702  Durbin-Watson stat 2.245984
Prob(F-statistic) 0.013647

Source: Regression result by the researcher
The coefficient of liquidity ratio in the table 4.2 shows a negative relationship between liquidity ratio and return on asset of the banks. The standard error coefficient was minimal, which shows that the margin of error is very small in this analysis. The R-squared coefficient shows that the regression line is not well fitted, while the adjusted R-squared shows that only 6% variation in the dependent variable is caused by the independent variable. The Durbin-Watson coefficient shows no autocorrelation problem.

The F-statistic (P-value) is less than 0.05, hence we reject the null hypothesis and conclude that there is a significant relationship between liquidity ratio and profitability of the deposit money banks in Nigeria.
Hypothesis two
Ho: There is no significant relationship between cash to deposit ratio and profitability of the deposit money banks in Nigeria.
Hi: There is a significant relationship between cash to deposit ratio and profitability of the deposit money banks in Nigeria.

Table 4.3: relationship between ROE and CDR
Dependent Variable: ROE
Method: Least Squares
Date: 09/18/16  Time: 02:12
Sample: 2000 2015
Included observations: 16

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>8.15459</td>
<td>2.54906</td>
<td>2.943780</td>
<td>0.0107</td>
</tr>
<tr>
<td>CDR</td>
<td>15.92865</td>
<td>9.273667</td>
<td>-1.717622</td>
<td>0.1079</td>
</tr>
</tbody>
</table>

R-squared 0.174052  Mean dependent var 36.20250
Adjusted R-squared 0.115056  S.D. dependent var 44.24938
S.E. of regression 41.62604  Akaike info criterion 10.41180
Sum squared resid 24258.18  Schwarz criterion 10.50837
Log likelihood -81.29438  Hannan-Quinn criter. 10.41674
F-statistic 2.950225  Durbin-Watson stat 2.855567
Prob(F-statistic) 0.007894

Source: regression result by the researcher.
The coefficient of cash to deposit ratio in the table 4.3 shows a positive relationship between cash to deposit ratio and return on equity of the banks. The standard error coefficient was minimal, which shows that the margin of error is very small in this analysis. The R-squared coefficient shows that the regression line is well fitted, while the adjusted R-squared shows that only 11% variation in the dependent variable is caused by the independent variable. The Durbin-Watson coefficient shows no autocorrelation problem.
The F-statistic (P-value) is less than 0.05, hence we reject the null hypothesis and conclude that there is a significant relationship between cash to deposit ratio and profitability of the deposit money banks in Nigeria.

Hypothesis three
Ho: There is no significant relationship between loan to deposit ratio and profitability of the deposit money banks in Nigeria.
Hi: There is a significant relationship between loan to deposit ratio and profitability of the deposit money banks in Nigeria.

Table 4.4: relationship between NIM and LDR
Dependent Variable: NIM
Method: Least Squares
Date: 09/18/16  Time: 02:14
Sample (adjusted): 2000 2014
Included observations: 15 after adjustments

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.004643</td>
<td>3.142379</td>
<td>1.958594</td>
<td>0.0720</td>
</tr>
<tr>
<td>LDR</td>
<td>0.007388</td>
<td>0.457018</td>
<td>2.116739</td>
<td>0.0541</td>
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</tbody>
</table>

R-squared 0.256318  Mean dependent var 12.38333
Adjusted R-squared 0.199111  S.D. dependent var 4.771741
S.E. of regression 4.270344  Akaike info criterion 5.864832
Sum squared resid 237.0659  Schwarz criterion 5.959238
Log likelihood -41.98624  Hannan-Quinn criterion 5.863826
F-statistic 4.480584  Durbin-Watson stat 2.722937
Prob(F-statistic) 0.054141

Source: regression result by the researcher.

The coefficient of loan to deposit ratio in the table 4.4 shows an insignificant relationship between loan to deposit ratio and net interest margin of the banks. The standard error coefficient was minimal, which shows that the margin of error is very small in this analysis. The R-squared coefficient shows that the regression line is well fitted, while the adjusted R-squared shows that only 19% variation in the dependent variable is caused by the independent variable. The Durbin-Watson coefficient shows no autocorrelation problem.

The F-statistic (P-value) is greater than 0.05, hence we accept the null hypothesis and conclude that there is no significant relationship between loan to deposit ratio and profitability of the deposit money banks in Nigeria.

5.0 Conclusion and Recommendations

**Conclusion:** The importance of banking system to economic stability and development necessitates effectively administered banking laws and regulations, which will serve as operating restraints on the bank. For the success of operations and survival, Nigerian DMBs should not compromise efficient and effective liquidity management. They are expected to maintain optimal liquidity level in order to satisfy their financial obligations to customers or depositors and maximize profits for the shareholders. The optimal liquidity level could be attained if banks religiously maintain the minimum liquidity requirement as stated by Central Bank of Nigeria. This attempt helps to reduce cases of bank distress. Excess liquidity and illiquidity are “financial diseases” that can easily erode the profit base of a bank as they affect bank’s attempt to attain high profitability level. Therefore any bank that has the aim of maximizing its profit level must adopt effective liquidity management. It can finally be concluded that liquidity is inversely related to profitability. This means, that as liquidity increases, profitability decreases and vice versa.

**Recommendations:** The following recommendations were made in order to ameliorate the problems associated with liquidity management in the Nigerian DMBs.

1. Deposit money banks, should avoid keeping excessive liquidity as a provision of unexpected withdrawal demands of the customers. They should find it reasonable to adopt other measures of meeting such requirements which can include lending and borrowing at the interbank market at reasonable rates of interest as well as discounting of eligible bills.

2. Monetary policies of CBN adversely affect liquidity management of the Nigerian DMBs, thus, the Central Bank of Nigeria should take the interest of the later into consideration while
establishing and implementing these monetary policies in general and the liquidity ratio in particular by avoiding ‘fire brigade’ approach and hawkish policies.

3. The liquidity needs of the banking system are usually defined by the sum of reserve requirements imposed on banks by a monetary authority (CBN, 2012). To guide banks’ management on the expected level of liquidity in the system over a period of time, liquidity management which involves the planning and control of cash and other liquid assets, may be supported by daily liquidity forecasting by the Central bank so that appropriate measures are taken to prevent undesirable market developments that may negatively impact on the objective of price stability.

4. The monetary authority should as a matter of urgency encourage and legitimate the use of credit cards and enforce cheque usage for huge amounts in the day to day business transactions. This action will go a long way to remedy the problem of maintaining huge idle cash in vault in expectation of unprecedented withdrawal, as the movement of cash will be highly reduced.

5. There is a need to invest the excess of liquidity available at the banks, in a various aspects of investments in order to increase the banks’ profitability and to get benefits from the time value of the available money, also the Nigerian deposit money banks should adopt a general framework for liquidity management to assure a sufficient liquidity for executing their works efficiently, and there is a need to make an analytical study of the liquidity evolution rates to assess the banks’ ability to achieve a balance between sources and uses of funds, the banks need to adopt of a scientific methods in detection of the strengths and weaknesses points of liquidity, especially in light of the sudden circumstances that may over expose the banks.

References


