



## LIQUIDITY AND CAPITAL STRUCTURE DECISIONS OF LISTED DEPOSIT MONEY BANKS IN NIGERIA

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### **Abstract**

*In determining appropriate financing mix, managers must apply caution in ensuring that liquidity is considered so as to minimise cost and maximise profitability for their banks. Against this backdrop, this study examines the impact of liquidity on the capital structure of listed Deposit Money Banks (DMBs) in Nigeria from 2006 to 2019. The study employs secondary data obtained from the 13 sampled quoted DMBs' Annual Accounts. Granger non-causality and dynamic Generalized Methods of Moment (GMM) estimations are used to analyse the relationship between liquidity ratio and the capital ratio. The regression result shows that loans to deposit ratio, proxy for bank liquidity has significant and positive impact on the equity capital ratio of DMBs. In addition, there is a bi-directional causality link between liquidity ratio and capital structure of Nigeria banks. The paper concludes that the liquidity ratio has a significant impact on the financing decisions of the Nigerian DMBs. Hence, the study recommends that banks should try to maintain sufficient liquid funds and assets above mandatory liquidity requirement, to enable them meet the immediate demand of their depositors and borrowers as well as reduce their financial risk position when designing an optimum capital structure.*

**Keywords:** Capital Structure, Leverage Ratio, Liquidity risk, Generalized Methods of Moment (GMM).

### **1. Introduction**

The management of liquidity is extremely crucial for banks because of the needs to meet depositors' and borrowers' demand as well as other obligations as at when due. The banks' core functions of deposits taking and credit creations require an adequate amount of working capital and their ability to manage liquidity and profitability conflicts are essential. Thus, liquidity is considered as one of the most important factors affecting financing decisions of firms (Ayunku, 2017). Given that bank loans constitute the largest proportion of Deposit Money Banks' total assets and these loans are normally financed by the combination of shareholders and depositors' funds thus, an appropriate measure of banking sector liquidity would be the ratio of total loans to total deposit as against current assets to deposit liability or current assets to current liability ratio that is commonly used for non-financial firms (Fadare, 2011).

The choice of appropriate capital structure also represents a major decision for any bank (Marandu & Sibindi, 2016). This is because the financial decision is predicated not only on the need to maximize shareholder returns, but also on the need to ensure the banks are able to cope



with their competitive environment. That is, capital structure does not only allow for banks' profit maximisation, it reduces the likelihood of failures while increasing their survival chances in the midst of various economic conditions and business circles (Akhtar, Bano, Bano, Zia and Jameel, 2016). Capital structure in financial terms refers to the appropriate mix of debt and equity capital to finance firms' assets (Rahman, 2019). The capital structure is measured by book equity capital ratio as total equity capital divided by total assets. According to Aymen (2013), the optimal capital structure means a target debt capital ratio which is achieved as a result of trade-off between the costs and benefits of debt versus equity.

In the midst of the challenging operating environment due to global financial crisis and economic recession, the Nigerian banks' capital structure is influenced by the level of equity capital and debt instruments just as it is adversely affected by liquidity risk (Uremadu, 2012). According to NDIC (2019), the industry's average capital ratio, recorded a declining trend of 33.66 percent in 2016, 66.32 percent in 2017, 15.3 per cent in 2018 and 14.5 per cent in 2019. The banks' shareholders also recorded a significant decrease of 15.16 percent from ₦3,131.72 billion recorded in 2016 to ₦2,656.98 billion in 2017 due to the accumulation of bad loans, high level of provisions and operating losses recorded by some DMBs during the period. Similarly, the debt instruments declined from 2.86 percent in 2016 to 3.47 percent in 2017 while the DMBs borrowings also decreased from 7.74 percent in 2016 to 7.50 percent in 2017 respectively (NDIC, 2018; CBN, 2019). Similarly, the number of DMBs that were technically insolvent increase from 3 in 2016 to 4 in 2017 with the recapitalization requirements increasing from N398.60 billion in 2016 to over N1.57 million in 2017 (NDIC, 2018; CBN, 2019).

Furthermore, a number of studies around the world such as Yuga (2016), Ghasemi and Ab Razak (2016), Muhammad and Alkali (2017), Burksaitiene & Draugele (2018), Salman (2019)) have sought to understand the impact of liquidity on the capital structure but concentrated on non-financial firms. Although, most of the studies on banks' capital structure such as AL-Mutairi and Naser (2015), Muhammed, Gewdan and Babela (2017) and Seba and Jitendra (2019) have largely treated the issue of liquidity as just one of the determinants of capital structure without exploring it in-depth as a single most important variable. Similarly, these same studies were concentrated at developed and developing countries whereas, little is known of researchers' efforts within Nigeria, to holistically explore the liquidity variables that affect the capital structure of the banking sector. More so, these studies also used current ratio and quick ratio to measure liquidity of banks while ignoring the relevance of loans to deposits ratios as a measure of liquidity, which applies to the banking industry considering their peculiarities and core functions of deposit taken and credit creations which is the riskiest assets of the banks.

Methodologically, previous researches on capital structure such as Sarlija and Harc (2012), Hamid, Gholam, Majid and Masoud (2013), Kajanathan and Achchuthan (2013), Karlsson and Svensson (2015), Yuga (2016), Ghasemi and AbRazak (2016), Andarsari, Winarno and Istanti (2016), Muhammad and Alkali (2017), Burksaitiene and Draugele (2018), Salman (2019), have mostly favoured the Pearson correlation and Ordinary Least Square (OLS) method of analysis which appears static and not robust enough to show the nature of relationship between the variables whereas, the dynamic Generalised Method of Moment (GMM) estimator is ignored, this technique is considered more appropriate to address OLS classical assumptions as well as eliminate the presence of endogeneity problem between liquidity and the capital structure of



banks that may lead to inconsistent estimates. In addition, these prior studies only concentrated on investigating the effect of liquidity on the capital structure whereas, a causal relationship could not be established between the dependent and independent variables.

Furthermore, Nigerian banking sector is chosen for this study because the sector is bedeviled with liquidity challenges and its consequential effect on the banks' financing behaviour, ultimately affect the Nigerian economy. Empirically, liquidity risk and its effect are used for identification of capital structure that allows a balance between long-term value of the banks and its exposure to risk. This study therefore attempts at filling the gaps identified in the literature by investigating the impact of liquidity on the capital structure of listed DMBs in Nigeria between 2006 -2019. Specifically, it seeks to examine the impact of loans to deposit ratio on capital structure and determine the causal relationship between liquidity risk and capital structure ratios of listed DMBs in Nigeria. Based on the statement of the problem, the following hypotheses were formulated to guide the study;  $H_{01}$ : There is no significant impact of loans to deposit ratio on capital structure of listed DMBs in Nigeria and  $H_{02}$ : There is no causal relationship between liquidity management ratio and capital structure of listed DMBs in Nigeria. This study on completion will contribute to existing studies as well as making up for the paucity of scholarly papers in order to update evidences on the impact of liquidity risk on the capital structure decisions of DMBs in Nigeria.

## **2. Literature Review**

### **2.1. Empirical Studies**

Several studies by researchers of varying background have yielded different and conflicting results. Prominent among studies relevant to this current study are; Sarlija and Harc (2012) who employed pearson correlation coefficient to test the relationship between capital structure and liquidity ratios as well as liquidity ratios and debt ratios of a sample of 1058 Croatian firms. The result shows that there exist statistically significant correlations between liquidity ratios and leverage ratios as well as between leverage ratios and the structure of current assets. But the study failed to investigate the impact of liquidity on capital structure rather they concentrated on the nature of relationship between liquidity and capital structure surrogates. Hamid, Gholam, Majid and Masoud (2013) employed statistical technique to investigate the effect of liquidity on capital structure decisions of 50 firms in the Tehran Security Exchange (TSE) between the period 2005 and 2012. The results revealed that modified liquidity has a significant negative whereas, illiquidity of the company measured by the sum of daily ratio of absolute stock return to trading volume over a certain period has a significant positive effect on the financial leverage but the study ignored asset liquidity and concentrated on stock liquidity. Kajanathan and Achchuthan (2013) used the regression analysis to examine the influence of liquidity on the capital structure decisions of telecon Plc in Sri Lanka between the period of 2005 and 2011. The study used data on liquidity and capital structure surrogates. Findings revealed that capital structure decisions significantly depending on the liquidity management of the Sri Lanka Telecom Plc.

Dada and Ukaegbu (2015) investigated the explanatory power of the Pecking Order Theory on the determinants of capital structure of listed non-financial firms in Nigeria from 2007 to 2013. The study employed fixed effect and vector error correction model to determine the target capital structure and establish causality between the leverage and determinant variables such as liquidity. The results showed that capital structure of Nigerian firms negatively related to



liquidity. In addition, it was found that there is a causal relationship ranging from liquidity to the capital structure. This implies that the pecking order theory is applicable to Nigerian firms. However, the study only focused on non-financial firms but ignored banking firms. Similarly, Karlsson and Svensson (2015) conducted a comparative analysis by investigating the linkage between capital structure and liquidity of firms in the IT and real estate sectors in Sweden between 2003 and 2014. The findings reveal that liquidity has a significant positive relationship in the case of real estate whereas that of the IT companies show a negative relation with capital structure. The study recorded different relationships and inconsistent results for different sectors in the same country. AL-Mutairi and Naser (2015) obtained data from a sample of 47 commercial banks listed on Gulf Cooperation Council stock markets to investigate the determinants of banks' capital structure decision between 2001 and 2010. The findings showed that liquidity has insignificant but negative effect on capital structure. But the capital structure and liquidity were measured by total liabilities to total assets and liquid assets to deposits respectively. Adaramola and Olarewaju (2015) employed panel data regression technique to identify the most important determinants of capital structure of Nigerian Quoted Composite Insurance Companies between 2008 and 2014. The results revealed that liquidity as one of the determining factors have significant and negative impact on the capital structure of quoted composite Insurance companies in Nigeria.

Yuga (2016) investigates the impact of liquidity on capital structure of Nepalese manufacturing companies listed in Nepal Stock Exchange. The study employed descriptive and causal comparative research designs while the regression model was used to analyse the pooled data of 5 manufacturing companies for the period of 2008 to 2014. The findings of the study showed that liquidity ratios have significant negative association with capital structure. But liquidity was measured by three different proxies; current ratio, liquidity ratio and net working capital of firm Ghasemi and Ab Razak (2016) employed Pooled OLS to investigate the impact of liquidity ratios (quick ratio and current ratio) on the capital structure measured by different debt ratios among the 300 listed companies in the main market of Bursa Malaysia between 2005 and 2013. The results of the study show that quick ratio has a positive effect on leverage whereas, current ratio is negatively related to leverage. However, it further shows that short-term debt has been more influenced by liquidity than long-term debt. This study ignored the use of preliminary tests for data cleansing and result robustness. It also failed to investigate causal relationship between capital structure and liquidity risk surrogates. Andarsari, Winarno and Istanti (2016) empirically tested the direct and indirect effect of liquidity, size and profitability on capital structure of Koperasi Wanita in Malang, East Java Indonesia. The study employed path analysis methods to analyse data collected from 16 sample from Koperasi Wanita through purposive sampling technique. The result showed that large amount of liquid assets (internal funds) is sufficient to fund the operations of the cooperative in order to pay short-term liabilities thus, the high liquidity leads to decline on the debt proportion used by cooperatives in accordance with the funding needed to run the business activities.

Muhammad and Alkali (2017) investigated the effect of liquidity on the capital structure of listed conglomerate firms in Nigeria. Multiple regression techniques were used to analyse panel data obtained from a sample of ten (10) listed conglomerate firms in the Nigerian Stock Exchange between 2009 and 2015. The results of the study show that the current ratio and cash conversion circle have significant positive while the quick ratio has a negative relation with leverage as a



measure of the capital structure of listed conglomerate firms in Nigeria but used current and quick ratios to measure liquidity risk. Muhammed, Gewdan and Babela (2017) investigated factors affecting capital structure of the banks listed on Iraqi Stock Exchange (2009-2014). The study employed descriptive analysis, Pearson coefficient correlation and multiple linear regressions to examine the relationship between dependent variable proxied as leverage and independent variables proxied as determinants amongst which is liquidity. Findings revealed that liquidity have a strong negative significant relationship with the bank's capital structure.

Burksaitiene & Draugele (2018) used descriptive statistical, correlation and regression analysis on 400 observations from companies in Baltic countries to investigate the impact of company's capital structure on the liquidity risks of 10 listed companies in Nasdaq Baltic Stock market. Findings showed that there exists a strong negative relationship between capital structure ratios and liquidity measured by current ratio and quick ratio. That is, the more equity is used in capital structure of the company, the lesser is the liquidity risk in the company why the more debt capital is used, the higher the risk. Salman (2019) employed regression analysis to examine the effect of capital structure on liquid and growth in the Pakistan tobacco industry. The study used secondary data obtained from tobacco companies listed on Karachi stock exchange over the period between 2011 and 2016. The results revealed a significant negative relationship between long-term debt and liquid assets whereas a positive association also exists between leverage and liquidity. But the results of this study vary with different measures of capital structure and narrow data set. Seba and Jitendra(2019) employed dynamic panel generalized method of moments (GMM) model to investigate whether bank-specific variables determine the speed of adjustment to the target capital ratio of commercial banks in India by using the data spanning, from 1997 to 2014. Finding revealed that liquidity measured by loan to asset ratio among others affect the target capital ratio of the commercial banks in India.

Summarily, the results of the prior empirical studies reviewed on the liquidity and capital structure variables among different authors shows varying relationships and inconclusive in respect of the influence of concerned variables on the financing choices of firms for different sectors in the same country with different measures of capital structure and narrow data set. For instance, studies such as Ghasemi and Ab Razak (2016); Muhammed, Gewdan and Babela (2017); Burksaitiene & Draugele (2018); provide evidences that liquidity significantly and positively related to capital structure whereas, Hamid *et al.* (2013); Dada and Ukaegbu (2015);AL-Mutairi and Naser (2015);Yuga (2016); Salman (2019) shows a significant negative relationship between liquidity and capital structure.

## **2.2. The Trade-Off Theory**

This study is anchored on the Trade-Off theory of capital structure. The origin of trade-off theory dates back to a study conducted by Kraus and Litzenberger in 1973 where it was argued that firms determine their capital structures in the best form. According to Myers and Majluf (1984), a static trade-off theory is an extension of Modigliani and Miller (1963) theory where it was argued that due to the tax deductibility of interest payments, firms may prefer debt to equity. This theory predicts that firm chooses their mix of debt and equity financing by balancing the cost and benefits of debt (Nwude & Anyalechi, 2018). This theory was based on the assumptions that there are benefits to leverage within a capital structure until a target optimal capital structure is set according to the nature and requirements of business and this is gradually achieved. This is



done by evaluating what firms might earn from using debt against what might cost them in the future. The theory suggests that firms with high ratio of liquid assets should borrow more because they have the ability to meet their contractual obligations on time due to available liquid funds. According to Hamid *et al.* (2013), this theory predicts a positive relationship between liquidity and leverage. This was supported by Ghasemi and AbRazak (2016); M'ng, Mahfuzur and Selvam (2017) who opined that banks with higher liquidity may have high debt because of their ability to meet short-term liabilities meaning that there exists a positive relationship between liquidity and leverage ratio. This assertion was also confirmed by some empirical studies like Ghasemi & AbRazak (2016).

### **3. Methodology**

This study is quantitative in nature and therefore adopts *ex-post facto* research design. The design precludes the researcher from manipulating the data since it is secondary and already in existence. The data are used to test the cause and effect of the relationships that exist among the study variables using panel data. The data for the study variables which include banks' liquidity ratio, book capital ratio, collateral and profitability were obtained from published annual reports and financial statements of the sampled listed DMBs for the period 2006-2019. This period covered the 2007/2008 financial crisis experienced by Nigerian DMBs as well as post consolidation exercise to date.

The study's population comprises the entire fourteen (14) listed Deposit Money Banks on the Nigerian Stock Exchange from 2006 to 2019. The purposive non-probability sampling technique was used to select 13 listed DMBs as sample size representing 93% of the study population. Only Jaiz bank Plc. was excluded from the sample due to its non-existent as at 2006 and because of its modus operandi of non-interest banking that makes it dissimilar to that of other listed DMBs in the population. These sampled banks are Access Bank, Ecobank, First Bank of Nigeria, First City Monument Bank, Fidelity Bank, Guaranty Trust Bank, Zenith Bank, Stanbic IBTC Bank, Sterling Bank, Union Bank of Nigeria, United Bank for Africa, Unity Bank, and Wema Bank Plc.

The dependent variable in the model is book capital ratio and the independent variable is represented by loans to deposits ratio. These variables were chosen because firms in different sectors choose various liquidity strategies based on their requirements and necessity of their activities. Similarly, they are variables of interest and has been tested by previous studies with varying and conflicting results. In order to identify what liquidity really captures, additional variables such as profitability and collaterals were included in the model to control for the interaction between liquidity and capital structure.

The study made use of inferential statistics and preliminary tests, that is, the study adopts Generalized Methods of Moment (GMM) dynamic panel estimator's framework (Seba & Jitendra, 2019) and Granger-causality estimations (Afolabi, Adeyemi, Salaudeen, & Fagbemi, 2018). In addition, Levin, Lin & Chu and Hadri unit root test were conducted to determine variables' order of integration. The GMM estimator is used to address potential endogeneity problems while Toda Yamamoto (1995) Granger non-causality model test was used to determine the direction of the causal relationship between the liquidity and capital structure variables.



In line with the objectives of the study, two (2) models were adapted in order to determine the impact of the liquidity risk on capital structure and to test the causal relationships that exist between loans to deposit ratio and capital ratio of Deposit Money Banks in Nigeria also, in accordance with hypotheses 1 and 2 respectively.

The models were specified as follows:

$$\text{Model 1: BLEV}_{it} = \beta_0 + \beta_1 + \beta_2 \text{LDR}_{it} + \beta_3 \text{ROA}_{it} + \beta_4 \text{COLL}_{it} + U_{it} \dots\dots\dots (1)$$

$$\text{Model 2: BLEV}_{it} = \beta_0 + \sum_{i=1}^{k+dmax} \beta_{1i} \text{BLEV}_{t-1} + \sum_{i=1}^{k+dmax} \beta_{2i} \text{LDR}_{t-1} + \sum_{i=1}^{k+dmax} \beta_{3i} \text{ROA}_{t-1} + \text{COLL}_{t-1} U_{it} \dots\dots\dots (2)$$

Where:

**ECAR =** Equity capital ratio of banks proxy for capital structure is defined as Tier 1 capital (equity) divided by total assets (Wang & Ke, 2013). Capital structure can either be measure in terms of book or market value (Basel Committee on Banking Supervision, 2014). According to Admati and Hellwig (2013), the book leverage measure is less prone to measurement problems, whereas capital ratio measures based on market value are often prone to changes and suffer from various measurement problems.

**LDR =** Liquidity has to do with ability of firms to perform its obligations and how the firm assets to be converted into cash (Sarlija & Hanc, 2012). In this study, bank liquidity is measured by the total loansto total banks’ deposits ratio (Aragaw, 2015). However, a high ratio indicates lower liquidity and associated with a higher probability of crisis because in this situation, bank is fully loaned-up relative to its stable funding whereas, a low ratio suggests that a bank is highly liquid, since it can grant new loans financed with stable deposits (Frank & Goyal, 2003;Aragaw, 2015; Ayunku, 2017).

**ROA =** This is Returns on Assets Employed as a proxy for banks’ profitability (Marandu & Sibindi, 2016). The return on assets is defined as the ratio of profit after tax to total assets of banks.

**COLL =** Collateral is a measure of tangibility and represent the banks’ liquidation value. It is defined as the ratio of total securities, cash due from bank to book value of assets (Isola and Akanni, 2015). According to trade-off theory, collateral is expected to have negative relation with book leverage (capital structure).

$\beta_0$  = Constant or interceptor

$\beta_1, \beta_2 \dots$  = Regression Coefficients to be estimated

$U_{it}$  = Error term,  $\sum$  is summation,  $k$  is the lag length,  $dmax$  is order of integration and  $(k + dmax)$  is the order of VAR.

**4.Results and Discussions**

This section presents results of testing hypotheses and preliminary tests of the variables of the study in order to draw conclusions.

**4.1. Unit Root Test**

Table 4.1 presents the unit root test to ascertain whether the variables are stationary or not.

**Table 4.1: Summary of Unit root Test Results**

Variables	Levin, Lin & Chu t	Hadri Z – stat	Level	Remarks
ECAR	-2.5948 (0.0047)	5.1839 (0.0000)	I(0)	No Unit Root
LDR	-3.8227 (0.0001)	3.2930 (0.0462)	I(0)	No Unit Root
ROA	-2.1536 (0.0156)	1.6830 (0.0462)	I(0)	No Unit Root
COLL	-5.5328 (0.0000)	3.2306 (0.0006)	I(1)	No Unit Root

*Source: Author’s Computation (2020).*

Table 4.1 presents the Levin, Lin & Chu t\* and Hadri Z-stat methods of panel unit root test results. The null hypothesis implies the existence of unit root and the alternative hypothesis suggests the absence of unit root. The results showed that the p-values of all variables are less than a 5% level of significance. Thus, the ECAR, LDR and ROA are stationary at zero level order of integration (I(0)) but COLL is stationary at first difference meaning that it is stationary at first order of integration. This provides evidence that there exists a long-run relationship between the variables of the study.

## 4.2. Regression Results

### Testing of Null Hypothesis One (Ho<sub>1</sub>)

Table 4.2 shows the results of the Generalized Method of Moments (GMM) estimation for testing the null hypothesis one (Ho<sub>1</sub>) that there is no significant impact of loans to deposit ratio on capital structure of listed DMBs in Nigeria in model one. Thus, the Table presents summary information about the impact of liquidity management on capital structure of listed DMBs in Nigeria.

**Table 4.2: Results of the Null Hypothesis One (Ho<sub>1</sub>)**

**Dependent Variable: ECAR**

Model 1. Variables	Coefficients	Std. Error	t-Statistic	Prob.
ECAR (-1)	0.420	0.032	12.991	0.000
LDR	0.069	0.011	6.369	0.000
ROA	1.336	0.163	8.179	0.000
COLL	-0.576	0.072	-7.950	0.000
J-statistic	11.961			
Prob(J-statistic)	0.288			

*Source: Author’s Computation (2020).*

The Generalized Method of Moments (GMM) estimation output in Table 4.2 is expressed in equation as  $ECAR = 0.420*ECAR(-1) + 0.069*LDR + 1.336*ROA - 0.576*COLL$ . However, the model shows a high p-value of the J-statistic which indicates that the instruments are all valid. The regression output indicates liquidity (LDR) has a positive estimated coefficient  $\beta$  value of 0.069, standard error of 0.011, t-value of 6.369 and p-value of 0.000. This indicates that a percent increase in loans to deposit ratio (liquidity) will leads to a significant increase in equity





capital ratio (capital structure) by 7.0 percent. This result is significant at 1 percent level thus, the result rejected the null hypothesis and accepted the alternative hypothesis that loans to deposit ratio (liquidity) has significant and positive impact on leverage (capital structure) of listed DMBs in Nigeria.

**Testing of Null Hypothesis Two (Ho<sub>2</sub>)**

Table 4.3 represents results of Toda-Yamamoto non-causality MWALD test showing the summary information about the causality relationship between liquidity ratio and capital structure of listed DMBs in Nigeria. The results revealed that the chi-square (X<sup>2</sup>) test-statistics of liquidity management measured by loan to deposit ratio (LDR) is 7.005, df = 2 with p-value = 0.030 indicates a 5% level of significance. The result further showed that ECAR has a chi-square (X<sup>2</sup>) test-statistics of 6.128, df = 2 with p-value of 0.047 which is significant at 5% level. The causality that runs from liquidity management [LDR=ECAR] is statistically significant as confirmed by P-value [0.030] and the p-value of 0.047 also significant at 5% level. The results therefore rejected null hypothesis (Ho) and accepted the alternative hypothesis that there is statistically significant bi-directional causal relationship between liquidity and equity capital ratios.

**Table 4.3: Toda-Yamamoto Modified Wald Granger Non- Causality Tests**

Null Hypothesis: (Ho)	Chi-sq	Df	Prob.	Results	<i>Source: Author's Computation</i>
LDR does not Granger Cause ECAR	7.005	2	0.030	Sig. Reject H <sub>0</sub>	
ECAR does not Granger Cause LDRP	6.128	2	0.047	Bi-directional Causality	

*tion (2020).*

**4.3. Discussion of Findings**

The summary results of tested hypotheses are presented in Table 4.4 and the discussion of findings follows. However, the results of the study are consistent with some of the findings of previous studies.

**Table 4.4: Summary Results of Tested Hypotheses**

Null Hypotheses	Hypotheses Statement	Results/ Decisions
Ho <sub>1</sub>	Liquidity risk has no significant impact on capital structure of DMBs in Nigeria	Sig.@ 1% level, Reject H <sub>0</sub>
Ho <sub>2</sub>	There is no significant causal relationship between liquidity risk and capital structure of DMBs in Nigeria	Sig.@ 5% level, Reject H <sub>0</sub>

*Source: Author's Computation (2020)*

The Generalized Method of Moments (GMM) estimation in Table 4.2 shows that the liquidity management has positive impact on capital structure which is statistically significant at 1% level. This result implies that an increase in liquidity ratio will significantly increase equity capital ratio of DMBs in Nigeria. This is because of the positive sign of the coefficient of loans to deposits



ratio which conformed to apriori expectation. The result is also consistent with trade-off theory that suggests a positive relationship between liquidity and long-term debt level of firms. That is, banks with high liquidity prefer equity financing to debt, meaning that banks lower their debt to equity ratio when they have more liquid funds and assets. This is possible because liquid banks will have access to capital market to raise long-term capital with minimum costs at their convenient time and they can even build up their equity capital internally. Bank with higher liquid assets can create liquidity reserve to have more equity capital ratio with lesser liquidity risk to finance its operations and investments. In addition, the positive influence of liquidity on capital ratio enable banks to consider liquidity as a guarantee for survival during the hard time when there are lower earnings, high costs that made it difficult for them to be funded on the capital market. This result is similar to findings of Hamid, Gholam, Majid and Masoud (2013), Karlsson and Svensson (2015), Ghasemi and Ab Razak (2016), Muhammad and Alkali (2017) and Burksaitiene & Draugele (2018) where a positive relationship between liquidity and capital structure were documented. The result however, is contrary to findings in Kajanathan and Achchuthan (2013), AL-Mutairi and Naser (2015), Adaramola and Olanrewaju (2015), Yuga (2016), Muhammed, Gewdan and Babela (2017), Seba & Jitendra (2019), Salman (2019) where a negative relationship was found between liquidity and capital structure of firms.

Finally, the result further shows that there exists a bi-directional causality relationship between liquidity and capital structure ratios because the result is statistically significant as confirmed by p-values of 0.030 and 0.047 for liquidity and capital structure ratios respectively. The results therefore rejected null hypothesis ( $H_0$ ) and accepted the alternative hypothesis that there exists a significant causal relationship between liquidity ratio and capital structure and equally, a reverse causal relationship running from the capital structure to liquidity ratio of DMBs in Nigeria. This implies that liquidity management significantly and positively granger cause capital structure and equally, capital structure significantly and positively granger cause liquidity management. The result is consistent with the study in Dada and Ukaegbu (2015).

## **5. Conclusion**

Most prior studies could not established causal relationship between liquidity risk and capital structure of banks in Nigeria. Also, Pearson correlation and Ordinary Least Square (OLS) statistical methods were more favoured than the dynamic Generalised Method of Moment (GMM) estimator which is more appropriate. This study examines the impact of loans to deposit ratio on capital structure and determine the causal relationship between liquidity risk and capital structure ratios of listed DMBs using GMM estimator. The study concludes that the liquidity management proxy by loan to deposit ratio has a significant and positive impact on the capital structure decisions of DMBs in Nigeria. That is, the lower the proportion of loans to deposits of banks, the higher the liquidity and the higher the capital structure. This means that highly liquid banks used their liquid funds (net working capital) to finance their operations and investments internally and therefore increase their equity capital which equally lowers their financial risk. Lastly, the study shows that there is a significant, positive and bi-directional causality relationship between liquidity management and capital structure therefore, generates a trade-off between the benefits of liquidity management and financial stability induced by appropriate capital structure. The study therefore, concludes that liquidity management can be used to determine the appropriate financing decisions and at the same time capital structure decision should be considered as strategy for managing the liquidity of DMBs in Nigeria during the period of study.



## 6. Recommendations

In the light of this, the study recommends that Nigerian banks should consider the level of liquidity and effective management of credits and high deposits mobilization that are less likely to put pressure on banks in the event of stressed market conditions. This will provide banks with liquid funds to enable them meet the immediate demand of their depositors and borrowers to reduce their financial risks. Finally, in line with the existence of a direct and reverse causality link from liquidity management to capital structure, the study recommended that banks should try to hold a buffer of highly liquid assets or cash that can be drawn down when their liabilities fall due most especially when banks are unable to renew its existing sources of funding or there is difficulty in liquidating existing assets. This will enable banks to attain optimal liquidity level that will guarantee financial stability through the increased capital ratio that will equally help to reduce liquidity risks.

## References

- Admati, A. & Hellwig, M. (2013). *The bankers' new clothes: What's wrong with banking and what to do about it*. Princeton, NJ: Princeton University Press.
- Adaramola, A. O., & Olanrewaju, O. M. (2015). Determinants of capital structure in Nigerian quoted composite insurance companies. *Global Journal of Management and Business Research: Corporate Finance*, 15(10), 1–10.
- Akhtar, N., Bano, M., Bano, S., Zia, H. T., & Jameel, N. (2016). Capital structure impact on banking sector performance in Pakistan. *International Review of Management and Business Research*, 5(2), 519–534.
- Andarsari, F. D., Winarno, A. & Istanti, L. N. (2016). The effect of liquidity, cooperative size and profitability on the capital structure among Koperasi Wanita in Malang, East Java. *Journal of Business and Management (IOSR-JBM)*, 18 (7), 49 - 53.
- Afolabi, M. A., Adeyemi, K. K., Salaudeen, O. S. & Fagbemi, T. O. (2018). Monetary policy and bank credit in Nigeria : A Toda Yamamoto approach, *ACTA Universitatis DANUBI*, 14 (5), 717 - 734.
- AL-Mutairi, A. N. & Naser, K. (2015). Determinants of capital structure of banking sector in GCC: An empirical investigation. *Asian Economic and Financial Review*, 5 (7), 959–972.
- Aragaw, H. A. (2015). *The impact of capital structure on profitability of commercial banks in Ethiopia*. Published Master of Science Degree Thesis Submitted to the Department of Accounting and Finance, Addis Ababa University, Addis Ababa.
- Aymen, B. M. (2013). Impact of capital on financial performance of banks: The case of Tunisia. *Banks and Bank Systems*, 8(4), 47 - 54.
- Ayunku, P. E. (2017). An evaluation of liquidity management and banks performance in Nigeria: A correlation matrix approach. *Noble International Journal of Business and Management Research*, 1 (8), 123 – 128.
- Burksaitine, D. & Draugele, L. (2018). Capital structure impact on liquidity management. *International Journal of Economics, Business and Management Research*, 2 (1), 110 - 127.
- Basel Committee on Banking Supervision. (2014). Leverage ratio framework and disclosure requirements. *Bank for International Settlements*, Basel III.



- C.B.N. (2019). Central Bank of Nigeria annual reports and accounts, Abuja.
- Dada, F. B., & Ukaegbu, B. (2015). The pecking order theory: Evidence from listed firms in Nigeria. *International Finance and Banking*, 2(2), 72–84.
- Fadare, S. O. (2011). Banking sector liquidity and financial crisis in Nigeria. *International Journal of Economics and Finance*, 3(5), 3 – 11.
- Frank, M., & Goyal, V. (2003). Testing the Pecking Order Theory of capital structure. *Journal of Financial Economics*.67(2), 217–248.
- Ghasemi, M. & Ab Razak, N. H. (2016). The Impact of Liquidity on the Capital Structure: Evidence from Malaysia. *Internal Journal of Economics and Finance*, 8 (10), 130 – 139.
- Hamid, B., Gholam, R. H., Majid, S. & Masoud, B. (2013), The study effect of liquidity on capital structure decision in the Tehran Security Exchange. *World Open Journal of Finance and Accounting*, 1(1), 1 – 9.
- Isola, W. A., & Akanni, L. O. (2015). Corporate financial structure of non-financial quoted companies in Nigeria. *Managing Global Transition*, 13(3), 267-280.
- Kajananthan, R. & Achchuthan, S. (2013). Liquidity and Capital Structure: Special reference to Sri Lanka Telecom Plc. *Advances in Management & Applied Economics*, 3 (5), 89 – 99.
- Karlsson, D. & Svensson, M. (2015). The linkage between liquidity management and capital structure: a comparative analysis essay between real estate and it companies in Sweden. University of Gothenburg, 1 – 49.
- Kraus, A., & Litzenberger, R. H. (1973). A state-preference model of optimal financial leverage. *Journal of Finance*, 28(4), 923–931.
- M’ng, J. P., Mahfuzur, R. & Selvam, S. (2017). The determinants of capital structure: Evidence from public listed companies in Malaysia, Singapore and Thailand. *Financial Economics Research Article, Cogent Economics and Finance*, 5, 1-34.
- Marandu, K. R. & Sibindi, A. B. (2016). Capital structure and profitability: An empirical study of South African banks. *Academic Investigations & Concepts Section1, Corporate Ownership & Control*, 14(1), 8-18.
- Maziar, G. & Nazrul, H. A. R. (2016). The impact of liquidity on the capital structure: Evidence from Malaysia. *International Journal of Economics and Finance*; 8 (10); 130 – 139.
- Modigliani, F. & Miller, M.H. (1963). Corporate income taxes and the cost of capital: A correction. *The American Economic Review* 53, 433 – 443.
- Mohammed, R. I., Gewdan, K. M. A. & Babela, I. S. T. (2017). Factors Affecting Capital Structure of The Banks Listed on Iraqi Stock Exchange. *Humanities Journal of University of Zakho (HJUOZ)*;5 (2) 487– 495.
- Muhammad, M. I. & Alkali, M. M. (2017). Liquidity and capital structure: Evidence from listed conglomerate firms in Nigeria. *African Journal of Management*, 2 (1), 52 - 67.
- Myers, S. & Majluf, N. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13, 187-221.
- N.D.I.C. (2017). Financial condition and performance of the banking industry. *N.D.I.C. Annual Reports*, 11, 115 - 142.
- N.D.I.C. (2018). Financial condition and performance of insured institutions. *N.D.I.C. Annual Reports*, 11, 91 - 112.
- N.S.E. (2006-2018). Nigerian Stock Exchange Market Fact Book, Abuja.



Salman, A. (2019). Effect of capital structure on corporate liquidity and growth: Evidence from Tobacco Industry in Pakistan. *Academy of Strategic Management Journal*, 18(2), 1–20.

Sarlija, N. & Hanc, M. (2012). The Impact of Liquidity on the Capital Structure: A Case Study of Croatian Firms. *Business Systems Research*, 3(1), 30-36.

Seba, M., & Jitendra, M. (2019). Dynamic adjustment towards target capital adequacy ratio: Evidence from Indian commercial banks. *Global Business Review*, 20(3), 757–768.

Schularick, M. & Taylor, A. M. (2012). Credit booms gone bust: monetary policy, leverage cycles, and financial crises, 1870–2008. *American Economic Review*, 102(2), 1029 -1061.

Uremadu, S. O. (2012). Bank capital structure, liquidity and profitability: Evidence from the Nigerian banking system. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 2(1), 1–15.

Wang, C., & Ke, X. (2013). *Determinants of bank Capital: Evidence from the U.S.* Simon Fraser University, 1 – 34.

Yuga, R. B. (2016). Effect of liquidity on the capital structure of Nepalese manufacturing companies. *International Journal of Marketing & Financial Management*, 4 (3), 01 -14.

**Appendix**

**Variance Inflation Factor and Tolerance Results**

Variables	VIF	Tolerance
LDR	1.22	0.819
LR	2.11	0.474
ROA	1.12	0.893
COLL	1.12	0.893
Mean VIF	1.39	

*Source: Author's Computation (2019).*

**Table 4.4: Lag Order Selection Criteria**

Lag	LogL	LR	FPE	AIC	SC	HQ
0	301.84	NA	1.43e-10	-8.48	-8.32	-8.42
1	538.83	433.35	3.35e-13	-14.54	-13.57*	-14.16*
2	574.40	59.96	2.50e-13	-14.84	-13.07	-14.14
3	607.62	51.26*	2.03e-13*	-15.08*	-12.51	-14.05
4	627.61	27.99	2.48e-13	-14.93	-11.56	-23.42

*Source: Author's Computation using E-views 9.0 (2018). Note: ( \*) indicates lag order selected by the criteria and each test at 5% level. LR: Sequential modified LR test statistic, FPE: Final predictor error AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion*

**Descriptive Statistics**

Variables	Mean	Median	Mini	Max	Std. Dev.	Obs.
<b>BLEV</b>	0.8635	0.8560	0.6370	2.5470	0.1644	182
<b>LDR</b>	0.6286	0.6080	0.1420	3.2290	0.2855	182
<b>ROA</b>	0.0255	0.0190	-0.0910	0.4480	0.0433	182
<b>COLL</b>	0.0735	0.0375	0.011	0.6060	0.1174	182

*Source: Author's Computation (2019).*

**Correlation Matrix**

VARIABLES	BLEV	LDR	LR	ROA	ATG
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<b>BLEV</b>	1.0000				
<b>LDR</b>	-0.1578	1.0000			
<b>ROA</b>	-0.2326	-0.0969	-0.1065	1.0000	
<b>COLL</b>	-0.0093	-0.0276	-0.1383	0.3085	1.0000

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*Source: Author's Computation (2019).*

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