# LIQUIDITY MANAGEMENT ON PERFORMANCE OF DEPOSIT MONEY BANKS IN NIGERIA

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**ABSTRACT**

The study evaluated the effects of liquidity management on bank performance in Nigeria over a 35-year period, from 1986 to 2020. Inferential statistics were used in the investigation, which included the Autoregressive distributed lag model. The Central Bank of Nigeria Statistical Bulletin was used to collect time series data on cash reserve ratio, liquidity ratio, loan to deposit ratio, and return on shareholder's fund. In Nigeria, the study discovered evidence of a long-run association between liquidity management and bank performance. The study also discovered that the cash reserve ratio, liquidity ratio, and loan to deposit ratio all have a favorable and significant impact on bank performance in Nigeria. As a result, liquidity management, as measured by the cash reserve ratio, liquidity ratio, and loan to deposit ratio, has the potential to improve bank performance in Nigeria. According to the findings of the study, liquidity management has a favorable and significant impact on bank performance in Nigeria.

**KEYWORD:** Liquidity Management, Deposit Money Bank, Return on Shareholder Fund, Nigeria

**JEL classification:** C22, E58, G21

## 1. INTRODUCTION

The financial sector is regarded as a fundamental and basic sector among the world's economies; adequacy and productivity in the operation of those economies cannot be achieved in the absence of money from the financial sector; as a result, many emerging nations require an all-around created and functional monetary market (Sanyaolu, Akintaro, Adebayo and Adefolu, 2019). Bagh, Khan, Azad, Saddique, and Khan (2017) regard the financial sector as a force to be reckoned with and a bastion of any economy due to the positive impact it has on the economic development and advancement of each nation.

Bank liquidity can be defined as a bank's ability to meet current developing obligations to its depositors and creditors, as well as the ability to meet new loan demand while adhering to existing reserve requirements. Liquidity is commonly used by a country's government, through its monetary experts, to assess a bank's strength in performing its intermediation role, which improves useful venture (Agbada and Osuji, 2013). Positively, banks cannot function efficiently without a large amount of monetary assets to carry out its intermediation role, among other things; all things considered, it is critical to stay profitable in business and handle customer withdrawals on demand. These two functions are inherently contradictory, necessitating thoughtful consideration. Banks reactivate inactive funds received from loan specialists by placing them in various portfolio classes through their monetary intermediation role. The deposits from these fund savers, which were donated by the bank's revenue driven maximization, can be evaluated or requested if the final option isn't able to meet their monetary responsibilities. Given the public's loss of faith in the financial sector as a result of recent bank problems, as well as the increasing competition rate in the financial sector as a result of the emergence of a large number of new banks, deposit money banks are finding it difficult to increase profit while also meeting the monetary needs of their depositors by maintaining sufficient liquidity (Okaro and Nwakoby, 2016).

The bank's test is a means to determine the optimal level at which it can manage its resources in order to achieve these two objectives. This problem is exacerbated by the fact that many DMBs are focused on benefit maximization, ignoring the importance of liquidity management (Obi-Nwosu, Okaro, Ogbonna and Atsanan, 2017). However, benefit maximization becomes a legend when the resulting liquidity can lead to both specialized and legal indebtedness, resulting in low patronage, deposit flight, and loss of the resource base (Agbada and Osuji, 2013).

Liquidity management and bank performance have long been discussed in the Nigerian setting. Various researchers such as Okaro and Nwakoby (2016); Idowu, Essien, and Adegboyega (2017); Fagboyo, Adedeji, and Adeniran (2018) found a positive and significant relationship with performance, whereas Adegbie and Dada (2018); Sanyaolu, Akintaro, Adebayo, and Adefolu (2019) found a negative and irrelevant relationship with performance. As a result, it may be stated that the findings of the aforementioned investigations are mixed and contradictory. To the

best of the scientist's knowledge, no other review has been followed to such performance assessment, aside from the study of Kurotamunobaraomi, Giami, and Obari (2017), which proxied banks' performance as return on investor's fund. The relevance of the return on investor's fund is that it is commonly used to track an organization's long-term performance or to compare companies in the same industry.

As a result, this study uses Return on Shareholders' Fund (RSF) as a measure of bank performance because it is more inclusive and effective than other performance indicators. Return on shareholders' funds is also important because it is a smaller measure of profitability when compared to return on capital employed, and thus provides the investor with a more in-depth understanding of a company's profitability. Furthermore, while studies have used econometric tools such as Ordinary Least Square, Johansen cointegration, board regression, and graphic measurements, to name a few, there are few proofs on the use of the Autoregressive Distributed Lag Model (ARDL) to the best of the researchers' knowledge and in light of current examinations. As a result, this study employs the ARDL econometric technique, which has not seen widespread application in the literature, to observe the relationship between liquidity management and bank performance using the cash reserve ratio (CRR), loan-deposit ratio (LDR), and liquidity ratio (LR) as proxies for liquidity management and the Return on Shareholders' Fund (RSF) as a performance metric.

## 2. LITERATURE REVIEW

According to Olagunji et al (2011), liquidity is defined as a bank's ability to ensure regular availability to money to meet monetary obligations or developing obligations at a reasonable cost. To put it another way, bank liquidity refers to banks' ability to meet clients' withdrawal requests when they are expected. The long-term viability of deposit money institutions is dependent in large part on their liquidity, as illiquidity, as a harbinger of coming catastrophe, can quickly erode public trust in the financial system and cause results to be held on deposit. Fluid resources should be appealing and versatile. This means they can be turned to cash quickly and effectively, and they can be redeemed prior to development. Another characteristic of liquid resources is their value consistency. Because the costs of the former are constant while the costs and worth of the latter are not, bank deposits and transitory safeguards are more flexible than value projects in light of this trademark (Richard, 2013).

According to the trade-off theory, national banks' liquidity management impositions are geared toward having more liquidity to meet consumers' monetary needs. Miller (2005) and Bussen (2009) demonstrate this by stating that central banks force banks to keep liquidity in excess of their private ideal level, giving them leverage over their internal ideal liquidity level. According to Allen and Marguez (2011), this could result in a large willful liquidity cushion in aggressive business sectors, because larger liquidity provides a more successful assurance of the bank's dissolvability, allowing the bank to lend more excess to borrowers. The theory has

the effect of increasing banks' optimum liquidity levels and improving their performance of the banks over the long haul.

Unmistakable researchers have conducted a series of experimental investigations, some of which were examined in this review. Ibe (2013) focuses on how liquidity management affects bank profitability. In the review, regression analysis was used, and the results revealed a true critical relationship between liquidity management and bank profitability. Agbada and Osuji (2013) did another study on liquidity management and banking performance in Nigeria. The questionnaire was chosen as the research tool, and the data was analyzed using Pearson correlation analysis, with the results being presented in tables. The findings revealed that there is a link between good liquidity management and good banking performance, and that good liquidity management enhances bank adequacy. To investigate the impact of liquidity management on bank performance in Nigeria, Duruechi et al (2016) use banks performing loans and advances (PLA), bank reserves (RSV), interest in government protections (GOVS), homegrown interbank claims (DIBC), and unfamiliar cases (FORC). The Johansen Co-integration test was used to determine whether or not there was a causal association and a long-term relationship between liquidity management measures and bank performance in Nigeria. Furthermore, the ordinary least square experimental results revealed that all of the measures were truly significant and positive in character, with the exception of Foreign Claims (FORC), which was found to be irrelevant.

Bassey et al (2016) look at the impact of liquidity management on bank performance in Nigeria from 2000 to 2010. The review's findings revealed that banks' successful operations and long-term viability are dependent on competent and successful liquidity management. Edem (2017) examines the impact of liquidity management on deposit money bank performance in Nigeria between 1986 and 2011. Using unambiguous correlations and regression insights, it was discovered that liquidity management and deposit money bank performance in Nigeria have a vital relationship. The correlation results suggest that return on value and liquidity management measures such as liquidity and cash reserve ratios have positive benefits, whereas the loan to deposit ratio has a negative influence. Regardless, the key outcomes demonstrate that only the banks with ideal liquidity can boost returns.

Kurotamunobaraomi et al (2017) use yearly data from 1984 to 2014 to examine the link between bank liquidity and company performance in Nigeria. The work employs cash reserve ratios, liquidity ratios, and loan-to-deposit ratios as liquidity intermediaries, and return on shareholders' funds as a performance proxy, as well as econometric tests such as ordinary least square regression, Johansen cointegration, Granger causality test, and mistake correction model. Observational findings reveal a key negative short-run association between cash reserve ratio and corporate performance, as well as a positive relationship between loan-to-deposit ratio and liquidity ratio on the one hand and corporate performance on the other, but only in the aggregate. Furthermore, the cash reserve ratio and liquidity ratio are measurably important in affecting long-term return on shareholders' funds, whereas the loan-to-deposit ratio is smug in actuating performance in deposit money banks

in Nigeria; a position supported by the Causality results, which infer that various factors, such as industry design and government approaches or regulations, could be responsible for banks' performance.

Between 2007 and 2016, Idowu et al (2017) used the Pearson correlation co-effective technique to investigate the relationship between liquidity management and bank performance in Nigeria. The results of the experiment show that the liquidity, return on resource, and return on value of banks are all inextricably linked. In any event, when return on resource is used as a proxy for profitability, the link isn't really important. The study suggests that effective management and control of issues impacting bank liquidity in the country could improve bank monetary performance. From 2012 to 2017. From 2012 to 2017, Otekunrin et al (2019) evaluate the performance of selected listed deposit banks and liquidity management in Nigeria. The capital ratio (CTR), current ratio (CR), cash ratio (CSR), and return on resources (ROA) were extracted from bank budget summaries and analyzed using the ordinary least square approach. In light of the review's consequences, liquidity management and company performance are inextricably linked. The findings suggest that liquidity management is a critical component of corporate operations and, as a result, leads to increased profitability. The impact of pay mix on liquidity of Nigerian deposit money institutions is the focus of Sanyaolu et al (2019). The review uses secondary data from the inspected institutions' annual reports and records from 2008 to 2017. A series of preliminary investigations were conducted, including illuminating, correlation summed up approach for second, and it was discovered that none of the aspects of interest on pay blend individually have a significant impact on liquidity. As a result, the ratio of premium pay, expenditure and commission pay, unfamiliar trade pay, and other pay is found to have a negative impact on liquidity, whereas speculation pay has a positive impact. The study finds that pay blend has a significant favorable influence on liquidity management when combined. Sahyouni and Wang (2019) look at how much liquidity was created by BRICS and G7 (excluding the US) banks from 2011 to 2015. It examines the influence of liquidity creation on these banks' profitability. The analysis uses regression analysis, and the results demonstrate that the banks mentioned in the example made 74.29 trillion dollars throughout the examined time. The findings of the regression analysis show that liquidity creation has a negative impact on the profitability of banks in the entire example (return on normal resources and return on normal value), arising nations' banks (return on normal resources), and fostered nations' banks (return on normal resources) (return on normal value). Nonetheless, the findings revealed that liquidity creation has little effect on the net revenue edge (NIM) of these companies.

## 3. METHODOLOGY

### 3.1. RESEARCH DESIGN, MODEL SPECIFICATION AND ESTIMATION TECHNIQUE

Ex-post facto research design is applicable in the context of this study. The model in this study is based on the model adopted by Edem (2017) on liquidity

management and banks performance. With performance variable modification, the proposed model is hereby stated as

*RSF = f (CRR, LDR, LR)* ----------------------------------------------------------- 1

Where:

RSF = Return on Shareholder's funds for banks' performance
CRR = Cash reserve ratio
LR = Liquidity ratio
LDR = Loan-to-deposit ratio

The test employed in this study is regression analysis which involves autoregressive-distributed lag (ARDL).

Hence, the model from equation 1 becomes

$$lnRSF = \alpha_0 + \alpha_1 lnCRR_t + \alpha_2 lnLDR_t + \alpha_3 lnLR_t + U_t - - - - - - - 2$$

### 3.2. *APRIORI* EXPECTATION, SOURCES OF DATA AND DESCRIPTION OF VARIABLES

Theoretically, cash reserve requirement, loan to deposit ratio, and liquidity ratio are expected to have positive influence on banks' performance in Nigeria. This is on the basis that liquidity management will have significant influence on bank performance in Nigeria.

Summarily, $\beta_1 > 0$; $\beta_2 > 0$; $\beta_3 > 0$; $\beta_4 > 0$

The data used were sourced and obtained from the Central Bank of Nigeria Statistical Bulletin. The data are collated from 1986 to 2020 which form a period of 33 years.

Return on Shareholders' fund (RSF): This shows how much money a shareholder receives at the end of t period. It is measured by dividing a company's earnings after taxes (EAT) as a percentage of total shareholders' equity. RSF = Earnings after tax / shareholders equity.

Cash Reserve Ratio (CRR): This represents the minimum amount of deposit that the Deposit money banks have to hold as reserve with the Central Bank.

Liquidity ratio (LR): Liquidity ratio is a term used to describe the ability of a bank to meet its financial obligations. Hence, it measures company's ability to pay its short term-debt.

Loan-to-deposit ratio (LDR): This represents a ratio that is used to determine the amount of loans that a bank has versus the amount of current deposits in the same hand.

## 4. RESULTS AND DISCUSSION

### 4.1. UNIT ROOT TEST

The unit root test is conducted to determine whether the variables are stationary and to determine the order of integration of the variables using the Augmented Dickey-Fuller (ADF) test.

*Table 1: Unit Root Test*

| Variables | Test statistics | Critical value | | | Order of Integration |
|---|---|---|---|---|---|
| | | 1% | 5% | 10% | |
| RSF | -3.203931 | -3.670170 | -2.963972 | -2.621007 | I(1)** |
| LR | -4.653046 | -3.670170 | -2.963972 | -2.621007 | I(1)** |
| CRR | -7.947120 | -3.670170 | -2.963972 | -2.621007 | I(1)*** |
| LDR | -4.071852 | -3.661661 | -2.960411 | -2.619160 | I(0)** |

**Note:** * (**) (***) denotes null hypothesis at 10%, 5% and 1% level of significant respectively
*Source:* E-view 9, Statistical Package

Table 1 showed the result of the Augmented Dickey-Fuller unit root test. From the result, it is shown that return on shareholder's fund, liquidity ratio, cash reserve ratio and loan to deposit ratio attained stationarity at 1% and 5% level of significance respectively. Individually, loan to deposit ratio attained stationarity at level while other variables of return on shareholder's fund, liquidity ratio and cash reserve ratio attained stationarity after differencing, i.e. at first difference and at 5% level of significance. The economic implication of this is that any shock or disturbance (e.g. government policy) to the variables will not be sustained for a long period of time meaning such shock will die off in a short while.

### 4.2. ARDL BOUND COINTEGRATION

*Table 2: ARDL Bound test*

| NULL HYPOTHESIS | F - STATISTIC | CRITICAL VALUES BOUNDS | | |
|---|---|---|---|---|
| | | SIGNIFICANCE | LOWER BOUND | UPPER BOUND |
| No long-run relationships exist | 14.706493 | 10% | 3.03 | 4.06 |
| | | 5% | 3.47 | 4.57 |
| | | 2.5% | 3.89 | 5.07 |
| | | 1% | 4.4 | 5.72 |

*Source:* Author's Computation, (2020) from E-view 9, Statistical Package

Table 2 reveals that the computed F-stat of 14.706493 is greater than the Upper Bound table value at any 10%, 5%, 2.5% and 1% level of significance. The study rejects the null hypothesis. This is interpreted as there is long-run relationship among the variables, that is, the variables co-move in the long run.

## 4.3. LONG AND SHORT RUN ESTIMATION COEFFICIENTS

Having confirmed the existence of long-run relationship among the variables, the study will estimate long run and short run parameters by general to specific procedure ARDL model.

**Table 3:** *Long Run Co-Integrating Coefficients*

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| RSF (C) | 0.244478 | 0.106520 | 2.295135 | 0.0333 |
| LR | 0.984618 | 1.079651 | 0.911978 | 0.3726 |
| CRR | 0.256000 | 0.103285 | 2.478589 | 0.0222 |
| LDR | 0.578680 | 0.156571 | 3.695951 | 0.0035 |

*Source:* E-view 9, Statistical Package

The result of Table 3 indicates that the coefficient of liquidity ratio is positive and statistically insignificant. Also, the coefficient of cash reserve ratio indicates positive and significant result and lastly, the coefficient of loan to deposit ratio posited a positive and statistically significant relationship with return on shareholder's fund.

## 4.4. THE SHORT-RUN DYNAMIC AND THE ERROR CORRECTION MODEL

**Table 4:** *The Short-run Dynamics and Error Correction Model*

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(RSF(-1)) | -0.400709 | 0.167727 | -2.389047 | 0.0269 |
| D(LR) | 0.101584 | 0.037554 | 2.705026 | 0.0205 |
| D(CRR) | 0.502242 | 0.198397 | 2.531499 | 0.0279 |
| D(LDR) | 0.639478 | 0.286698 | 2.230492 | 0.0373 |
| (ECM-1) | -0.292943 | 0.116952 | -2.504823 | 0.0210 |

*Source:* E-view 9, Statistical Package

The result in Table 4 indicates that the value of the coefficient is -0.292943. The result shows that about 29.29% of the short-run inconsistencies are being corrected and incorporated into the long-run equilibrium relationship in each period.

In the near run, the liquidity ratio (LR) has a large and positive link with the return on shareholders' funds. As a result, the liquidity ratio has a coefficient of 0.101584, implying that in the short run, the liquidity ratio increased return on shareholder's funds by 10.16 percent. The short-run finding also reveals that in Nigeria, the cash reserve ratio is favorably and significantly associated to shareholder fund return. As a result, the cash reserve ratio increased the return on shareholder funds by 50.22 percent. Finally, in Nigeria, the loan-to-deposit ratio has a significant impact on the return on shareholders' funds. If all other factors remain constant, a 1% increase in the loan-to-deposit ratio will boost shareholder wealth in Nigeria by 63.94 percent. The result equally validates the result of the long run relationship.

## 4.5. DISCUSSION OF FINDING

In this study, the impact of liquidity management on bank performance in Nigeria is investigated. The loan to deposit ratio is stationary at level I(0), while the liquidity ratio, cash reserve ratio, and return on shareholder's fund are stationary at first distinction I, according to the Augmented Dickey-Fuller (ADF) unit root test (1). In light of the blended request for integration, the decision clearly invalidates the guideline in accepting Johansen cointegration and approves the ARDL norm. As a result, the Pesaran ARDL bound test is used to check for the presence of co-integration among the variables, as it fits the review and the review demonstrates a long-term relationship between the factors.

The long-term association between liquidity management and bank performance shows that the F-insights of 14.706493 is superior than the lower and upper bound upsides of 2.86 and 4.01 individually. This article focuses on the impact of liquidity management on bank performance in Nigeria, and how liquidity management affects bank performance in Nigeria through time. As a result, it follows that bank liquidity management has the potential to increase the pace of performance and stability in the financial sector. This is in line with the findings of Duruechi et al (2016), who investigated the long-term relationship between liquidity management and bank performance in Nigeria.

When looking at the long-term and short-term effects of the review, it is discovered that the liquidity ratio has a positive and insignificant impact in the long run but has a tremendous impact in the short run. The positive association is expected and compatible with hypothetical and a priori expectations; additionally, the large influence is consistent with Uremadu (2012) and Bassey and Moses' precise research (2015).

Along these lines, Agbada and Osuji (2013) concisely capture the link between liquidity and profitability: The most extreme well-being, or, to put it another way, liquidity, can be achieved only if banks keep a large amount of cash against the deposits they hold. However, even if they do so, this will not assist the banks. Essentially, if they go the other way, that is, if they merely continue contributing and attempting to develop the profitability component, they will face illiquidity issues if clients demand for a large amount of product in a given period. As a result, the research concluded that a good broker should try to harmonize the two opposing goals by putting up a good portfolio blend. Examining the situation, focusing on the goals, and thus selecting an extended and adjusted resource portfolio should be conceivable.

Furthermore, the study found evidence of a significant and positive association between cash reserve ratio and bank performance in Nigeria, both in the long and medium term. The result confirms the a priori expectation and also supports the findings of Otekunrin et al (2019) and Kajola, Sanyaolu, Alao, and Ojunrongbe (2019) that the cash requirement ratio has a significant and fundamental impact on bank performance in Nigeria.

Under the review period, the impact of the loan-to-deposit ratio has a significant and positive impact on bank performance in Nigeria. The findings support the current exact investigations of Fadare (2011), Bassey and Moses (2015), and Kurotamunobaraomi et al (2017), which show that the loan-to-deposit ratio has a decisive and significant impact on bank performance in Nigeria. Furthermore, there is proof that if there is any short-run fluctuation in the explanatory factors, the disequilibrium in return on shareholder's fund is restored to balance within a year, on the grounds that the coefficient of the ECM is critical with the accuracy of its sign, but only to a small extent. In summary, the review contradicts the findings of Okaro and Nwakoby (2016), who found that liquidity management is unrelated to deposit money bank profitability in Nigeria. Nonetheless, the findings of Idowu, Essien, and Adegboyega (2017), as well as Kurotamunobaraomi et al (2017), show that liquidity management has a significant impact on bank performance in Nigeria.

## 5. CONCLUSION

The banking framework's benefit to economic stability and improvement necessitates successfully managed financial regulations and regulations, which will act as operating constraints for the bank. Nigerian DMBs should not hesitate to invest in viable liquidity management in order to attain operations and long-term viability. They are expected to maintain optimal liquidity levels in order to meet their financial obligations to customers or depositors while also increasing shareholder value. On the off chance that banks strictly adhere to the Central Bank of Nigeria's base liquidity requirement, the ideal liquidity level could be achieved.

In the context of this review, it is found that the factors considered in the model are stationary both at level and first contrast and have long run co-development. The discoveries of the review uncovered that cash reserve ratio, loan to deposit ratio and liquidity ratio shows positive and huge impact on banks' performance proxied by return on investor's fund in Nigeria.

The factors considered in the model are determined to be stationary at both the level and initial contrast in this review, as well as having long run co-development. The findings of the research revealed that in Nigeria, cash reserve ratios, loan to deposit ratios, and liquidity ratios had a favorable and significant impact on bank performance as measured by return on investor's funds.

In light of the findings of Kurotamunobaraomi, Giami, and Obari (2017), as well as Fagboyo, Adedeji, and Adeniran (2018), liquidity management definitely influences bank performance, as evidenced by the way the primary determinants together influence return on investor's funds. Similarly, the method that banks' performance in response to strategy drives on liquidity management gradually takes awareness of the change of the components to yield long run outcomes is oddly documented in this study, with the Error Correction Coefficient recorded at 29.29 percent. As a result, the study suggests that liquidity management has a significant impact on deposit money bank performance in Nigeria.

As a result of the experimental results, it is appropriate to propose several strategy solutions that could improve liquidity management and bank performance in Nigeria: Deposit money banks should avoid keeping excessive liquidity as a reserve for unforeseen client withdrawal needs. They should think about different ways to meet such needs, such as loaning and receiving at reasonable rates of return on the interbank market, as well as limiting qualified bills; as a matter of urgency, the Central Bank of Nigeria should reduce cash reserve ratios to help deposit money banks in the country perform better; banks should fully utilize the loan-to-deposit ratio by assisting marketing efforts.

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