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EFFECT OF LIQUIDITY MANAGEMENT ON FINANCIAL PERFORMANCE OF LISTED DEPOSIT MONEY BANKS IN NIGERIA

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ABSTRACT
The hitches of inefficiency in the management of banks liquidity in Nigeria became obvious in the banking system. Despite the prudential guidelines by the Central Bank of Nigeria to rectify and stabilize the banks performance challenges that was predominant in the economy, yet the banks still face liquidation. However, the study examined the effect of liquidity management on the financial performance of quoted Deposit Money Banks (DMBs) in Nigeria. Specifically, the study sought to determine the effect of current ratio, operating cost ratio and capital adequacy ratio on return on assets of listed deposit money banks in Nigeria. Ex post Facto research design was adopted to carry out the research work. The study concentrated on the period from 2011 to 2020. The data was collected from the individual financial reports of the listed twelve (12) deposit money banks in Nigeria. With the aid of ordinary least square regression analysis, the panel data was analyzed and the result shows that operating cost ratio and capital adequacy ratio had a positive significant effect on return on assets. while current ratio had a negative insignificant effect on return on assets. The study recommended that managers of DMBs should manage their current ratio in order to prevent the banks from folding up, by keeping too much of cash idle. Also, due to the significant effect of operating cost ratio, the study recommends that managers of DMBs should increase the operating cost order to meet daily obligations with loans recovery and asset managements. Finally, the study recommends that DMBs should maintain their capital adequacy in order to reduce credit risk and ensure that they are protected against non-performing loan. Therefore, good capital adequacy, on the other hand, lead to lower poor credit in banks and hence greater profitability.

Keyword: Liquidity, Management, Ratio, Deposit,

INTRODUCTION
Liquidity management 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 signifies obligations which mature within one accounting year. Short-term also reflects the operating cycle: buying, manufacturing, selling, and collecting (Wuave, et al, 2020). 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 (Winasis,

et al. 2020). High liquidity means there is a lot of capital because interest rates are low, and so capital is easily available. Low interest rates mean credit is cheap, so businesses and investors are more likely to borrow. The return on investment only has to be higher than the interest rate, so more investments look good. In this way, high liquidity spurs financial performance (Ogol, 2019). Current ratio is a general measure used for short-term solutions and a company's ability to meet debt when it becomes due. A high current ratio signals creditor that company is very liquid and is not burdened by debt obligations, however if it is too high it alerts investors that the company is not efficiently using its current assets or its short-term financial facilities. Current ratio is useful for assessing the company's ability to fulfil its obligations so that it can attract investors to invest. (Nikolaou, 2019).

Operating cost is such kind of expenses of a company that incurred in carrying out an organization's day-to-day activities, but not directly associated with investing decisions. Therefore, operating expenses of bank are non-interest expense connecting to the regular business of the bank. It is expected when a bank has higher operating expense per assets, the profitability of a bank declines (Emmanuel et al, 2022).

Capital adequacy, the measure of the solvency of a bank, tells whether a bank has enough capital to support the risks in its balance sheet. Onoh (2016) avers that a bank's capital fund is considered adequate if it is enough to cover the banks operational expenses, satisfy customers with dual needs and protect depositors against total or partial loss of deposits in the event of liquidation or loss sustained by the bank. Prudential guidelines on capital adequacy sets out the three main elements that determine a bank's capital adequacy, these are: credit risk associated with exposures; market risk arising from banking activities and the form and quality of capital held to support these exposures. The higher a capital adequacy the stronger the bank and the more protection of investors will have. This ratio ensures that banks are capable to fulfill the liabilities and other risk such as operational risk, credit risk and market risk. In Nigeria, the banks are required to maintain the CAR from time to time (Rahayu, et al., 2018).

The primary goal of corporate finance is to maximize shareholders' wealth. Companies are formed to benefit their owners by providing them with maximum returns and capital appreciation. A Company's shareholder value is a function of finance and investment decisions made by the management. As such, investors, management and other stakeholders need to be aware of the company's performance to make informed decisions about the future. However, creating wealth for shareholders requires firms to undertake liquidity decisions that they believe could impact shareholders' value (Zolkifli, et al., 2019).

Financial institutions and banks must maintain adequate liquidity at specific minimum level in order to avoid risks and bankruptcy. The regulators of capital requirements seek to guarantee that risk exposure on financial institutions and banks are supported by an adequate amount of capital which bears unexpected losses arising in the future. This ensures banks further promote their cushion of assets that can be utilized for liquidation claims. Financial Performance reflects the assessment of the financial condition or profitability of a bank in order to gain valuable insight into the health of the bank using an index that relates to return on asset (Ismail, 2019).

Statement of the Problem

The hitches of inefficiency in the management of banks liquidity in Nigeria became obvious during the distress and liquidation eras in the late 1980s as well as early 1990s. The adverse effects of the banking system liquidity problem in these periods remained up to the re- capitalization era in 2005 in which banks were mandated to increase their capital base from N2 billion to N25

billion. It was believed this directive by the Central Bank of Nigeria (CBN) would rectify and stabilize the banks performance challenges that were predominant in the economy but still yet the banks still face liquidation (CBN, (2020).

The Central Bank of Nigeria's (CBN) have continue to make several attempts to ensure efforts by providing prudential guidelines to measure the true health of each financial institution as capital adequacy regulations, asset quality regulation, earnings/ profitability regulation, liquidity regulation, exposure to FX risk regulation, leverage regulation, and debt service capacity regulation. DMBs in Nigeria have faced numerous challenges such as under-capitalization, slow branch expansion and weak management, insider fraud abuse and imprudent lending, lack of technical skill, banking knowledge and illiquidity related to their inability to meet customer cash withdrawals. Thus government, shareholders and other stakeholders continue to show considerable concern about how they are performing (Emmanuel et al, 2022).

Previous studies on liquidity management examined the effect on bank performance in Nigeria by Oluwafemi and Obawale (2017). Also, Gbalam and Uzochukwu (2020) surveyed the effect of current ratio on the performance. Al-khawaldah et al (2020) study was on the impact of capital adequacy on the return on equity of Islamic banks in Gulf Cooperation Council. Therefore, the objective of this study will be to examine the effect of liquidity management on financial performance of listed deposit money banks (DMBs) in Nigeria using current ratio, operating cost ratio and capital adequacy ratio as proxy to measure liquidity management. While return on asset will be used to measure financial performance.

Objective of the Study

i. To ascertain the effect of operating cost ratio on financial performance of quoted DMBs in Nigeria.
ii. To determine the effect of capital adequacy ratio on financial performance of quoted DMBs in Nigeria.

Research Hypothesis

H_{01}: Operating cost ratio has no significant effect on financial performance of quoted DMBs in Nigeria.

H_{02}: Capital adequacy ratio has no significant effect on financial performance of quoted DMBs in Nigeria.

LITERATURE REVIEW

Liquidity Management

Bordeleau and Graham (2019), defined liquidity management as a bank's capacity to fund increase in current assets and meet both expected and unexpected cash and collateral obligations at a reasonable cost and without incurring unacceptable losses. From capital perspective, researchers view liquidity as a financial term that describes the amount of capital that is available for investment. Liquid assets generally include cash, central bank reserves and government debt. Liquidity is essential because to remain viable firms should possess sufficient liquid assets to meet its short-term obligations.

Liquidity management in its utmost sense is the ability of any financial institution to meet its short-term obligations, either by liquidating its current asset, borrowing or by means of its external reserve. The concept of liquidity has been interpreted by so many authors and practitioners to be the ability of banks to meet obligations when required to do so. Bank liquidity

can be seen as the capacity of banks to finance increasing asset and meet unexpected and expected cash obligations without incurring unacceptable losses (Emmanuel, et al., 2022).

Bank's liquidity management in simple terms is the bank's ability to sufficiently maintain funds to meet its financial obligations such as cheques, cash, legitimate new loans and other withdrawal obligations while maintaining the statutory reserve requirements. The best capital structure is obtained by having in mind the financial requirements of both the short-term and long-term periods. According to Biety (2003), liquidity management is the ease and speed with which an asset is sold and still realizes fair price. Liquidity therefore is seen as the entries and leakages of cash through the firm as sales payment, product procurement, and the processes of collection taking place over time, by which asset can be converted into cash without a substantial loss of principal liquid asset. It is a relationship between the time frame it requires to make sales and the discount from fair market price of an investment asset. Therefore, an enterprise should make sure that it does not suffer from inadequate liquidity and at the same time, does not have surplus liquidity. The inability to meet financial obligations as a result of insufficient liquidity can result in loss of creditors' confidence and poor credit worthiness. On the other hand, a high percentage of liquidity can also result in cash being idle (CBN, 2015).

The concept of liquidity management involves the efficient and effective planning and organizing of the assets of banks that will maximize its profitability and liquidity at the lowest cost possible. Management of liquidity is the calculated supply or withdrawal of the amount of liquidity consistent with preferred level of short-term reserve money without altering the ability to make profit and operations of the bank from the market circulation (Agbada & Osuji, 2013). Generally, liquidity adequacy plays very important role in the successful running of all business organizations.

The concept of Liquidity has been a source of worry to the management of firms of the uncertainty of the future. 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. That's because the large financial institutions that do most investments prefer using borrowed money. Liquidity can be defined as the state or condition of a business organization which determines its ability to honour or discharge its maturing obligations. These maturing obligations are composed of current liabilities and long-term debts (Bordeleau, et al., 2019).

Liquidity can also be defined as a measure of the relative amount of asset in cash or which can be quickly converted into cash without any loss in value available to meet short term liabilities. Liquid assets are composed of cash and bank balances, debtors and marketable securities. Liquidity is the ability of a firm to meet all obligations without endangering its financial conditions.

Bank liquidity refers to the ability of the bank to ensure the availability of finds to meet financial commitments or maturing obligations at a reasonable price at all times. Put tersely, bank liquidity means a bank having money where they need it particularly to satisfy the withdrawal needs of the customers. The survival of commercial banks depends greatly on how liquid they are since illiquidity being a sign of imminent distress can easily erode the confidence of the public in the banking sector and results to deposit. Equally important is the need for adequate income through interest on loan to ensure continued provision of productive resources and survival. It therefore becomes uneconomic and financially unreasonable for banks to allow excess idle cash in the vault or excess liquidity. Hence, a need for effective liquidity management to maximize revenues while holding risks of insolvency to desired level (Cucinelli. 2015).

Liquidity measures the ability of the business to meet financial obligations as they come due, without disrupting the normal, ongoing operations of the business. Liquidity can be analyzed both structurally and operationally. Structural liquidity refers to balance sheet measures of the relationships between assets and liabilities and operational liquidity refers to cash flow measures. Solvency measures the amount of borrowed capital used by the business relative the amount of owner 's equity capital invested in the business. In other words, solvency measures provide an indication of the business'ability to repay all indebtedness if all of the assets were sold. Solvency measures also provide an indication of the business ability to withstand risks by providing information about the operation 's ability to continue operating after a major financial adversity (Alshatti, 2015).

Liquidity risk is the quickness and certainty with which an asset can be converted into cash/ income whenever the asset holder desires. According to Drehmann and Nikolaou (2018) a bank may be unable to meet its short term financial demands when required. This is referred to as liquidity risk. It normally happens when the firm is unable to convert its short-term assets or security to liquid cash without incurring capital or income loss in the course.

Ismail (2019) defined liquidity risk as the risk of being unable either to meet their obligations to depositors or to fund increases in assets as they fall due without incurring unacceptable costs or losses. This view by Ismail (2019) emphasis the existence of an existing loan balance that could be lost or jeopardized in the event of a credit event, inability to pay a due obligation, repudiation, or credit rating change means that your company's financial situation could worsen.

Jamal et al (2014) defined liquidity risk as the risk stemming from the lack of marketability of an investment that cannot be bought or sold quickly enough to prevent or minimize a loss. This definition views liquidity risk as the risk that a given security or asset cannot be traded quickly enough in the market to prevent a loss (or make the required profit).

The risk of liquidity mismatch is one way of measuring the company's degree of financial risk (Brunnermeier & Yogo, 2019). This study agrees and expands the definition put forward by Ismail (2019). Thus, liquidity risk is the risk of being unable either to meet their obligations to depositors or to fund increases in assets as they fall due without incurring unacceptable costs or losses. Liquidity risk arises due to inability of the commercial bank to transact or issue loans due to inadequate of sufficient capital.

Current ratio

Current ratio measures the company's ability to pay short-term liabilities such as payable accounts and short-term loans, which represents the ratio of current assets to current liabilities. The magnitude of this ratio expresses high liquidity of the company, thus a greater capacity to meet the short-term liabilities.

According to Anthony et al (2010), Current ratio can be defined as the relationship between current assets and current liabilities. This ratio is also known as "working capital ratio". It is a measure of general liquidity and is most widely used to make the analysis for short term financial position or liquidity of a firm. It is calculated by dividing the total of the current assets by total of the current liabilities. Current Ratio = Current Assets / Current Liabilities. According to the authors, the two basic components of this ratio are current assets and current liabilities. Current assets include cash and those assets which can be easily converted into cash within a short period of time, generally, one year, such as marketable securities or readily realizable investments, bills receivables, sundry debtors, (excluding bad debts or provisions), inventories, work in progress, etc. Prepaid expenses should also be included in current assets because they represent payments

made in advance which will not have to be paid in near future. Current liabilities are those obligations which are payable within a short period of generally one year and include outstanding expenses, bills payable, sundry creditors, bank overdraft, accrued expenses, short term advances, income tax payable and dividend payable.

Current ratio is the company's ability to pay short-term liabilities such as payable accounts and short-term loans, which represents the ratio of current assets to current liabilities. The magnitude of this ratio expresses high liquidity of the company, thus a greater capacity to meet the short-term liabilities. In contrast, decrease in the ratio under Expresses the deficit of liquidity and the part of the fixed assets financed by short-term debt. Although liquidity deficit could lead to a decline in the company's energy, this can affect profitability if the ratio means that current assets equal to current liabilities (Robinson 2015).

Concept of Operating Cost

Operating expenses is such kind of expenses of a company that incurred in carrying out an organization's day-to-day activities, but not directly associated with investing decisions. So, operating expenses of bank are non-interest expense connecting to the regular business of the bank (Bassey & Moses, 2015).

Demirguc-Kun and Huizinga (2019), pointed that operating expense to total assets. It is expected when a bank has higher operating expense per dollar assets, the profitability of a bank declines. On the other hand, when the operating expenses are directed for loans recovery, loans defaults, and asset managements, it is quite possible that the higher the operating expense, the higher profitability of a bank

Banks financial performance is revealed through income statement where there are the incomes and expenses and also are explained the results. One of the statements of a complete set of banks financial statement is the statement of comprehensive income for the period, which is presented: one statement (single statement approach - a statement of comprehensive income), or two statements (a separate income statement and a statement beginning with profit or loss and presenting components of other comprehensive income) (KPMG – Illustrative Financial Statement: Banks). Total income comprises: operating incomes (from ordinary, current activities of the bank excluding the influence of extraordinary factors) and extraordinary incomes (from activities and transaction that are unusual, infrequent). Total incomes comprise: net interest income; net fee and commission income; net trading income and other revenues. Net interest income is the difference between interest income and interest expenses. Net fee and commission income are the difference between fee and commission income and fee and commission expenses. Total expenses comprise mainly: staff expenses, net impairment loss on financial assets, depreciation and amortization expenses and other operating expenses.

Capital Adequacy Ratio

The concept of capital adequacy is rooted in the rearrangement of the existing capital structure of banks to mitigate wide spread distress. Banks, as financial institutions and business establishments, gain more opportunity in an atmosphere of adequate capital. The term 'capital' is related to recapitalization which serves as a means of absorbing losses that accrue in the process of carrying out banking operational activities and which eventually makes them to have enough capital bases to back up their services to their customers in form of loans, advances and investments which in return accrue profits to the banks (Otekunrin, et al., 2018).

Capital adequacy can be defined as the sum of the bank's paid-up share capital and its accumulated capital reserves. This capital is important for the protection of bank depositors and for the maintenance of public confidence in the operations of the bank. However, from the stand point of the bank, higher capital means lower returns for equity holders but regulators view capital as a necessary buffer to absorb possible losses before such losses will be charged against deposits. Capital can be regulatory or economic capital. Regulatory capital is the amount of capital required by regulators (domestic and international) or considered adequate to ensure a safe and sound banking system. Economic capital is the capital that a bank believes it should hold to cover the risk it is undertaking while performing its intermediation and investment functions. The Basel capital accords envisages that the higher the risk of loss, the higher the qualifying capital base needed by banks to maintain the stipulated capital adequacy ratio (Otekunrin, et al., 2018).

Capital adequacy by definition is seen as a quantum of fund, which a financial institution should have and plan to maintain in order to conduct its business in a prudent manner (Kishore, 2007; Pandey, 2005). Adequate capital is regarded as the amount of capital that can effectively discharge the primary function of preventing banking industries failure by absorbing losses, It is seen as a way of providing the ultimate protection against insolvency arising from the risk inn banking sector. It is the least amounts necessary to inspire and sustain confidence in the banks, keep it open and operating so that time and earnings can absorb losses without being forced into costly liquidation and enable banking industry to take full advantage of its profitable growth opportunities (Akintoye & Somoye, 2008). It is to be expected that firm value can be enhanced by judicious use of equity and borrowed capital.

Empirical Review

This subsection will review various empirical literature of scholars based on the objectives of the study.

Current Ratio and Financial Performance

Winasis, et al (2020) analyzed the effect of current ratio, cooperative size, debt to equity ratio and number of members against return on assets in Primkop Kartika KBA in Indonesia, and also to analyse variables that have a significant influence between Current Ratio, Cooperative Size, Debt To Equity Ratio and Number of Members in Primkop Kartika KBA Puskop Line ranks. The data taken in this study are data from Primkop Kartika financial reports in the KBA Puskop Board of 2015-2018 period. The method used is the time series method. For the formulation of the problem, objectives and research hypotheses, the analysis used is the model specification test, multiple linear regression analysis, t test, and F test. The results showed that the factors that influence Return on Assets in Primkop Kartika KBA Puskop Board of Staff are Cooperative Size and Number of Members, Current Ratio, Cooperative Size, Debt To Equity Ratio And Number of Members influential together to increase SHU Primkop Kartika KBA Puskop Line ranks, and among Current Ratio, Cooperative Size, Debt To Equity Ratio and Number of Members that have a significant influence on increasing SHU Primkop Kartika KBA Puskop Line ranks are Cooperative Size and Number of Members. The study was conducted in Indonesia, which result might be different from study in Nigeria.

Gbalam and Uzochukwu (2020) examined the relationship between current ratio and firm performance in Nigeria. To achieve this, they used selected industrial quoted firms in Nigeria that have consistently published their audited financial report between 2014 and 2019. A sample of fifteen (15) firms was used to form the sample of the study to ensure adequate observation for

statistical testing. They adopted a panel (balanced) data analysis to identify possible firm's specific types of working capital management in selected Nigerian quoted firms. To this end, they conducted descriptive statistics and correlation analysis to describe the data in the variables in the specified model. Fixed and random effects panel data techniques were conducted as well as the Hausman test which formed basis for selecting the preferred model between fixed and random effects models. Result indicate that current ratio exert negative and insignificant effect on firm performance as proxied by ROA, while cash management show positive but insignificant impact on firm performance. The study was conducted in Nigeria using Indutrial firm. While this study will use Deposit money banks which result will be different .

Rahmadi (2020) examined the factors that influence the ratio of payments in the banking industry. These factors include return on investment, current ratio, debt to equity ratio, earnings per share, and firm size. The technique for sampling using purposive sampling while the sample used in this study was 6 banking companies listed on the Indonesia Stock Exchange in 2014-2018. The analytical method used in this study was a panel data regression model (a combination of time series and cross section). From the results of the study, showed that the return on investment did not significantly affect the dividend payout ratio; the current ratio did not significantly influence the dividend payout ratio; the debt to capital ratio had a significant effect on dividend payout ratios; earnings per share did not significantly influence to the ratio of dividend payout ratios and the lastly was the size of the company had a significant effect on the ratio of dividend payout ratios. The study was conducted using other financial performance indicators, which result might be different from this study.

Operating Cost Ratio and Financial Performance

Bencharles and Abubakar (2020) investigated the impact of liquidity management on Islamic and conventional banks profitability in Nigeria for the period 2012-2019. First bank plc and Jaiz bank were both used to represent the conventional and Islamic banks in Nigeria respectively. Time series data were sourced from the quarterly bulletin of selected banks used for the study. Time series data were first subjected to preliminary analysis (descriptive statistics, unit root test & co-integration test) so as to ascertain the background characteristics of dataset. The ordinary least square estimation technique was used to capture the relationship between liquidity and profitability. Liquidity was measured by the liquid asset to operating asset ratio, current ratio and cash ratio while bank size was used as a control variable. Profitability was measured using the return on asset. Empirical result indicated that profitability and liquidity have an inverse relationship in both conventional and Islamic banks; hence it was found to follow the risk return trade off. However, Islamic bank profitability was found to respond more significantly to changes in liquidity level than in conventional banks. The study concluded that liquidity and profitability relationship follows the risk return theory, although liquidity was found to be more significant in the Islamic banks. The study therefore recommended that banks keeps liquidity as needed to meet up defined liabilities and not needlessly keeping too much liquidity as it erodes banks profits.

Mwangudza, et al (2020) adopted post-positivist research paradigm to interpret the effect of liquidity management on the financial performance of deposit-taking Saccos in Kenya. The study adopted a descriptive, survey research design. The target population was 18 Saccos classified under teachers' based DT SACCOs according to SASRA records of December 2017 (SASRA, 2018). Census Methodology was used. The study used a data capture form that has been designed by the researcher to collect the data on the independent variables of liquidity management, moderator

variable size and dependent variable which was DT Saccos financial Performance. Data were analysed using a combination of descriptive and inferential statistics with the statistical package STATA. Analysed data was presented using graphs and tables. The study established that there was a significant effect of capacity and purchased funds on the financial performance of Teachers DT Saccos. The study also established that cash position, total deposit, and core deposit had an insignificant effect on the financial performance of Teachers DT Saccos and that size of the Sacco affects the relationship between liquidity management and financial performance of Teachers DT Saccos.

Gerio and Wahome (2020) determined the influence of liquidity management on the financial performance of agricultural firms listed on Nairobi Securities Exchange. A descriptive survey research design was applied. A Census of all the 6 companies listed at Nairobi Securities Exchange as at July 2014 to July 2019 constituted the study population. The study employed secondary data extracted from audited financial statements and individual companies annual report for the five-year period covering July 2014 to July 2019. Record survey sheet was used when collecting data for independent and dependent variables. Data collected was analyzed by using descriptive and inferential statistics. Under descriptive statistics the study considered; Mean, Minimum, Maximum and Standard deviation. For inferential statistics the study considered correlation and multiple regression. Statistical Package of Social Science (SPSS) software program was applied in the analysis of the study with respect to the objectives of the study. The study found out that liquidity management has a positive significant effect on financial performance. The liquidity management has positive relationship with the Return on Investment (ROA) of the firms under study.

RESEARCH METHODOLOGY

The study employed ex-post facto research design using panel data for the period of ten years (2011-2020) to explore the effect of independent variables (current ratio, operating cost ratio assets and capital adequacy ratio) on the dependent variable (return on asset), and the nature of the relationship that exist between the variables. This study involves the use of descriptive statistics such as the mean, standard deviation, skewness and kurtosis to describe the various variables used in the study, and the inferential statistics such as the panel regression model to test the effects of the explanatory variables on the explained variable. The population of the study was 14 banks quoted on the floor of the Nigerian Stock Exchange as at 2020 (Access Bank Plc, Eco Bank Plc, Fidelity Bank Plc, First Bank of Nigeria Plc, First City Monument Bank Plc, Guaranty Trust Bank Plc, Jaiz Bank, Stanbic IBTC Bank, Sterling Bank Plc, UBA Plc, Unity Bank Plc, Wema Bank Plc, and Zenith Bank Plc). Filtering sampling technique was used to select 12 sample banks based on the criteria that Ecobank was listed as Eco Transnational incorporated and data was quoted in dollars hence was exempted from the sampled banks and Jaiz bank was listed in 2018 for the period of this study due to unbalanced data sets. The study utilized secondary data from Bank's Annual financial reports for the study. However, the study used the secondary method because it is more reliable for purposeful research work and also gives a direction for the research work which data can be collected without any bias in the information given. The ordinary least square (OLS) regression was used with the aid of E-views version 10 to determine and analyze the effect of Liquidity management on the financial performance of quoted DMBs in terms of ROA. Descriptive statistics, correlation matrix was conducted to ensure absent of the multicollinearity. Multicollinearity condition exists where there is high, but not perfect, correlation between two or

more explanatory variables. Thus, the panel regression model equations was used to evaluate the impact of liquidity management on ROA of quoted DMBs in Nigeria.

Correlation Analysis

Correlation analysis is a method of statistical evaluation used to study the strength of a relationship between two, numerically measured, continuous variables (height and weight). This particular type of analysis is useful when a researcher wants to establish if there are possible connections between variables. The study shall use correlation analysis to ascertain the degree or strength of the relationship between the variables. In correlation analysis, we shall estimate a sample correlation coefficient, more specifically the Pearson Product Moment correlation coefficient. The sample correlation coefficient, denoted r, ranges between -1 and +1 and quantifies the direction and strength of the linear association between the two variables. The correlation between two variables can be positive (i.e., higher levels of one variable are associated with higher levels of the other) or negative (i.e., higher levels of one variable are associated with lower levels of the other). The sign of the correlation coefficient indicates the direction of the association. The magnitude of the correlation coefficient indicates the strength of the association. Correlation of r = 0.9 suggests a strong, positive association between two variables, whereas a correlation of r = -0.2 suggest a weak, negative association. A correlation close to zero suggests no linear association between two continuous variables.

$$r = \frac{n\sum xy - \sum x\sum y}{\sqrt{\{(n\sum x2)-(\sum x)2(n\sum y2)-(\sum y)2)\}}} \ldots\ldots\ldots\ldots\ldots\ldots 1$$

Where:
r = Correlation Coefficient
x = proxies for independent variable
y = proxies for dependent Variable
n = number of observations

Panel Regression

Panel regression technique was used for this study given its superiority over pure cross section or pure time series. Panel data is the subject of one of the most active and innovative bodies of literature in econometrics, partly because panel data provide such a rich environment for the development of estimation techniques and theoretical results (Greene, 2003). In panel data, cross-sectional unit is surveyed over time. Studies on financial performance either cross-country or country specific have largely relied on panel techniques. The selection of variables for the estimated model was guided by relevant theories and existing empirical studies on the subject. Verbeek (2004) sets out the framework for panel study as:

$$y\text{it}=\alpha+x\text{it}\beta\text{it}+\varepsilon\text{it} \ldots\ldots\ldots\ldots 2$$

There are several advantages of working with panel data. Awunyo-Vitor and Badu (2012) observe that panel data facilitate identification of effects that cannot be detected using purely cross-section or time series data. According to Greene (2003), however, the fundamental advantage of a panel data set is that, it allows the researcher greater flexibility in modelling differences in behaviour across individuals.

The fixed versus random effects issue has generated a heated debate in the biometrics and statistics literature which has spilled over into the panel data econometrics literature (Baltagi, 2005). The challenge has been which model is better, FEM or REM? The answer to this question hinges on the assumption one makes about the likely correlation between the individual, or cross-

section specific, error component and the X regressors. If it is assumed that ei and the X's are uncorrelated, the REM may be appropriate, whereas if ei and they are correlated, FEM may be appropriate (Gujarati, 2004).

Judge et al (1982), however, suggest the need to have a statistical test for the hypothesis that ei and the X's are uncorrelated. Hausman in 1978 developed a test to decide whether to use FEM or REM (Gujarati, 2004). If the ei are uncorrelated with the explanatory variables, the random effects estimator is consistent and efficient, and the fixed effect estimator is consistent but not efficient. On the other hand, if the ei's are correlated with the explanatory variables, the fixed effects estimator is consistent and efficient but the random effects estimator is now inconsistent (Johnston & Dinardo, 1997).

The null hypothesis underlying the Hausman test is that the FEM and REM estimators do not differ substantially. If the null hypothesis is rejected, the conclusion is that REM is not appropriate and that we may be better off using FEM, in which case statistical inferences will be conditional on the in the sample (Gujarati, 2004).

Hausman Test

Hausmann test is carried out to decide which model is most appropriate between fixed or random effects model. It is carried out with the assumption that the null hypothesis is the preferred model. Random Effect Model is the null hypothesis while the alternative is the fixed effects. It tests whether the unique errors (ui) are correlated with the repressors; the null hypothesis is they are not. That is

Ho = Random Effect

HA = Fixed Effect

Hausmann test uses a statistical distribution chi square with degree of freedom as many as k where k is the number of independent variables. If there is a rejection of hypothesis zero where the value of statistics is greater than the critical value (the value of the table chi square) then model fixed effect is used and the reverse is the case where calculated value is less than the critical or table value.

In this study, Hausman test shall be used to test fixed effects model and random effects model (REM).

***H*0**: Random effects model is better than fixed effects model.

Random effects assume that the entity's error term is not correlated with the predictors which allows for time-invariant variables to play a role as explanatory variables. These characteristics that may or may not influence the predictor needs to be specified. The problem with this is that some variables may not be available therefore leading to omitted variable bias in the model. It allows for generalized inference beyond the sample.

***H*1**: Fixed effects model is better than random effects model.

Fixed Effects model explores the relationship between predictor and outcome variables within an entity. Each entity has its own individual characteristics that may or may not influence the predictor variables. Fixed Effects model assumes that something within the individual may impact or bias the predictor or outcome variables and this should be controlled. There is an assumption of the correlation between entity's error term and predictor variables. Fixed Effect removes the effect of time-invariant characteristics and assesses the net effect of the predictors on the outcome variable. Fixed Effect assumes that the time-invariant characteristics are unique to the individual and should not be correlated with other individual characteristics. Each entity is different therefore the entity's error term and the constant which captures individual

characteristics should not be correlated with the others. If the error terms are correlated, then FE is not suitable and can lead to incorrect inferences

Decision Rules

Decision Rule: Reject *H*0 if p-value is less than significance level. Otherwise, do not reject *H*0.

Decision: Reject *H*0 since the p-value is less than the significance level of 5%.

The Panel Regression Models are:

$ROA_{it} = a_0 + a_1CUR_{it} + a_2OPR_{it} + a_3CAR_{it} + U_{it}$……i

Where:

a_0 = intercepts,

a_1,$a_{1,}$ $a_{2,}$ a_3 = slopes or coefficients

U_{it} = error term.

ROA_{it} = Return on Asset of bank

CUR_{it} = Current ratio of bank

OPR_{it} = Operating cost ratio of bank

CAR_{it} = Capital adequacy ratio of bank

Justification of Methods

The ordinary least square (OLS) method of regression was adopted to measure the impact of liquidity management on financial performance. Regression Analysis is a statistical technique for modeling and investigating the cause-effect relationship between two or more variables. Also, many of the forecasting techniques use regression methods for parameter estimations. It is a means of viewing the cause-effect relationship that exist between two or more independent variables. Furthermore, the study will be based on panel data as the data are collected from various DMBs. Thus, it is likely to be exposed to problem of heterokedasticity consequently, panel regression model was used. Test of Multicollinearity will be done because of the multiple regression model to be used, as two and more explanatory variables are regressed against the explained variable. The study will focus on ten years (2011-2020) panel data because is sufficient to establish a line of best fit and describe the relationship that subsists between the variables of the study.

Variable Measurement Table

Variables	Description	Source
Return on Asset	Ratio of net profit after taxes to total assets.	Pandy (2010)
Operating cost ratio	operating expenses divided by interest Income	(Sinha, 2012)
Current ratio	Current asset divided by current liability	Anthony, Hawkins and Merchant (2010)
Capital adequacy ratio	Total capital / Total risk weighted assets	Onyekwelu et al (2018)

Source: Researcher's Computation 2024

CONCLUSION AND RECOMMENDATIONS

The research examined effect of liquidity management on financial performance of quoted deposit money banks in Nigeria for a period of 10 years (2011 – 2020). The study found that capital adequacy ratio and operating cost ratio have significant effect on return on assets of quoted deposit money banks in Nigeria. This shows that the capital adequacy significantly contributes to the financial performance in the banks. Therefore, an increase in capital adequacy ratio will automatically increase financial performance of quoted deposit money banks in Nigeria. The study also found that operating cost ratio has significant effect on financial performance of quoted deposit money banks in Nigeria. Meaning an increase in operating cost ratio will automatically increase financial performance of quoted deposit money banks in Nigeria.

Finally, the study concluded that current ratio has an insignificant effect on financial performance of quoted deposit money banks in Nigeria. This reveals that an increase in current ratio will not increase financial performance of quoted deposit money banks in Nigeria.

Based on the findings and conclusions from this study, the following recommendations were made;

i. Also, due to the significant effect of operating cost ratio, the study recommends that managers of DMBs should increase the operating cost order to meet daily obligations with loans recovery and asset managements.

ii. Finally, the study recommends that DMBs should maintain their capital adequacy in order to reduce credit risk and ensure that they are protected against non-performing loans. Therefore, good capital adequacy, on the other hand, lead to lower poor credit in banks and hence greater profitability.

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