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MODERATING EFFECT OF LEVERAGE ON THE RELATIONSHIP BETWEEN LIQUIDITY AND PROFITABILITY IN NIGERIAN DEPOSIT MONEY BANKS

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Abstract

The study investigates the moderating effect of leverage on the relationship between liquidity and profitability in Nigerian Deposit Money Banks. The study collected secondary data from the annual reports and accounts of the sampled DMBs for 10 years 2010-2019. The study employed current ratio, quick ratio and degree of financial leverage as the independent variables while the dependent variable is the return on assets of listed Nigerian DMBs. Collected data is analyzed using descriptive statistics, correlation, and multiple regression aided by Stata software version 17. Results from the first model of the study revealed that the R^2 of 0.1354 (13.54%) indicates that the independent variables collectively explained 13.54% of the return on assets. Results from the second model revealed that multiple coefficient of determinant R^2 is 0.2080 (20.80%); thus explaining 20.80% of change in Return on Asset. Similarly, the results revealed that liquidity measured by current ratio is negative and significant at 5% level of significance (β-0.1236, P< 0.05). Result on profitability measured by quick ratio (β 2.0303, P< 0.01) and Degree of Financial Leverage (β 2.9623, P< 0.05) were positive and significant at the 1% and 5% significance levels. On the overall, obtained results implies that studied variables contribute significantly to increasing the return on assets of listed Nigerian DMBs. The study therefore recommends that DMBs should maintain a balance between liquid assets and liabilities to maximize liquidity. Similarly, DMBs should adjust leverage ratios to maximize profits while maintaining financial stability by managing financial leverage and liquidity independently. .

Keywords: Leverage, Liquidity, Profitability, Deposit Money Banks

1. Introduction

Profitability is a critical factor in determining the continued existence, growth, and overall development of businesses and it serves as a key indicator of corporate performance. Understanding and maximizing profitability is critical in the context of Nigerian Deposit Money Banks (DMBs) in a dynamic and competitive financial sector. Profit, or

the distinction between sales and expenses over a given period, is the lifeblood of any business. Net income for DMBs reflects operational performance when revenues exceed operational costs. The primary goal for these banks is to establish consistent profitability, which is important for their long-term survival in a volatile market.

The income statement of a DMB is an important instrument that shows the business's revenue and expenses, offering a thorough picture of its profitability. Banks must run their activities efficiently in order to generate a positive net income. However, profitability does not exist in isolation; it is inextricably related to the banks' financial structure (Ojo, 2012). DMBs in Nigeria must balance profitability with liquidity to ensure long-term viability and resilience. Balancing profitability and liquidity is crucial for sustained operations and meeting financial obligations, as prioritizing one over the other can lead to challenges.

In the prevailing global economic situation, managing liquidity has received considerable attention. The requirement to grow profits, preserve safety through high liquidity levels, and optimize owner net worth highlights the multidimensional character of DMB liquidity aims (Zuhroh 2019). Efficient liquidity management entails not just meeting immediate obligations but also maintaining a security reserve for unforeseen situations. The study of liquidity becomes essential for both internal and external experts since it has a direct effect on everyday operations, and efficient management is critical to a commercial firm's performance (Bhunia, 2012).

Leverage, as a financial concept, is critical in molding organizations' operating dynamics, influencing profitability. It is the ratio of equity financing to debt financing, representing a company's strategic decision to maximize advantages while limiting associated expenses (Rayan, 2010). Debt financing and financial leverage are inextricably intertwined, with the former allowing investors to forecast interest payments on their investments (Enekwe et al., 2014). Financial leverage measures a company's ability to use external financing without jeopardizing its overall value (Vasilescu et al., 2014).

Nigeria's deposit money banks face challenges due to deteriorating liquidity management and high financing costs, leading to mergers and acquisitions. Understanding leverage's relationship between liquidity and profitability is crucial for effective financial strategies.

Previous research, such as Emmanuel's (2022) study of Nigerian consumer products companies, has demonstrated that leverage has a major impact on profitability. However, there is still a lack of consistency among theoretical approaches to financial structure and liquidity management, particularly in developing countries such as Nigeria. The present empirical literature is primarily from established economies, and investigating the competing traits and processes in emerging markets is a critical gap that must be addressed. This study aims to contribute to the academic discourse by investigating the moderating effect of leverage on the relationship between liquidity and profitability in Nigerian deposit money banks, providing insights that align with the unique challenges and opportunities in the Nigerian business environment (Mashamba, 2018; Prajapati, 2019; Ravindra *et al.*, 2020).

Interestingly, as a primary incentive for this study, an investigation of a growing market or economy such as Nigeria can provide new insight into the financial

structure discussion, this is now confined to the researcher's expertise. To this purpose, this study will attempt to fill a gap in the literature by investigating the effects of liquidity, leverage, and profitability on listed deposit money banks in the Nigeria Exchange Group (NXG).

Therefore, the main objective of the study is to examine the moderating effect of leverage on the relationship between liquidity and profitability in Nigerian deposit money banks. The specific objectives are to;

i. assess the effect of liquidity on the profitability of listed deposit money banks in Nigeria.
ii. examine the effect of leverage on the profitability of listed deposit money banks in Nigeria.
iii. evaluate the combine effect of leverage on the relationship between liquidity and profitability of listed deposit money banks in Nigeria.

This study which seeks to examine the effect of leverage on the liquidity and profitability of listed Deposit Money Banks (DMBs) in Nigeria is guided by the following hypotheses;

H_{01} Liquidity has no significant effect on profitability of listed deposit money banks in Nigeria.

H_{02} Leverage has no significant effect on profitability of listed deposit money banks in Nigeria.

H_{03} Liquidity and leverage has no significant effect on profitability of listed deposit money banks in Nigeria.

2. Literature Review

2.1 Conceptual Review

Profitability: Profitability is a measure of how effectively a corporation earns money from the resources at its disposal. It provides a foundation for future decisions on company expansion, asset purchases, and management control (Tehrani and Rahnama, 2012). It can be used to evaluate similar organizations in the same industry because it demonstrates what management has accomplished financially over a certain time period. According to Ongeri (2014), profitability allows business activities to be evaluated objectively in monetary terms. Financial ratios calculated from financial statements or market share prices can be used to determine how much better off a shareholder is at the end of an accounting period than he was at the start. Because the fundamental purpose of the corporation is to maximize shareholder value, performance evaluation helps determine the amount of wealthier a shareholder acquires as a result of investment decisions made over a given time period (Berger & di Patti, 2006).

Return on Assets: Return on assets (ROA) determines how well a company can use its resources to generate profits over a given time period. This ratio assists management and investors in understanding how successfully the firm can convert its investments in total assets into earnings, as the primary goal of a company's assets is to generate revenue and profits. The return on assets (ROA) of a corporation is calculated by dividing its annual earnings by its total assets. ROA is a gauge of management effectiveness, according to Pradhan et al. (2017) and Ekwe et al. (2012). The return increases with the management's efficiency in using its asset base (Harelimana, 2017). The ROA, which determines the return on all of the company's assets, is widely used as a broad measure of profitability; the higher the number, the more prosperous the business or organization (Crane, 2006).

2.2 Empirical Review

Effect of Liquidity on Profitability

Durrah, Abdul, Syed, and Nour (2016) investigate the effect of liquidity ratios on profitability for Amman Bursa-listed food companies. The study spanned three years, from 2012 to 2014. Their findings revealed that, whereas current ratios had a direct but small impact on the profitability of food industry enterprises listed on the Amman Bursa, liquidity ratios had no detectable effect on profit.

Sattar (2020) conducted research in the textile sector to assess the relationship between liquidity and profitability in the body of available literature. Stata 12 was utilized in the study to analyze the data using the basic regression technique. The study's findings demonstrated that, in 2014, the company's performance as determined by the proxy measure of return on equity (ROE) and liquidity had an impressive correlation; however, in 2015, the current ratio had a slight but direct impact on return on assert (ROA).

Onofrei, *et al.,* (2015) assess the capital structure elements for micro- and small businesses in Romania. They looked at five capital structure factors profitability, tangibility, liquidity, scale, and expansion opportunity and utilized debt ratio as the dependent variable. They've determined that tangibility, profitability, and liquidity are all adversely correlated with leverage, while the size of the company and growth potential also have a negative impact on leverage, but less significantly.

Effect of Leverage on Profitability

Ramli et al. (2018) examined into how company leverage affects the relationship between leverage and profitability in Malaysia and Indonesia. The research used the data that was available and covered the years 1990 to 2010. Scientists using the Malaysian sample discovered a perfect correlation between leverage and profitability. The survey shows that in order to boost profitability, Malaysian companies prefer debt financing over equity financing. The same study's conclusions demonstrated that, in Malaysia, a firm's leverage matters more than it does when using the Indonesian sample.

Dakua (2019) looked into how financial leverage was affected by liquidity in the Indian steel industry. Multiple regressions and a correlation matrix were used by the author to test the variables. The researcher discovered a favorable association between debt ratio, liquidity, and production. He did, however, draw an oblique connection between debt ratio and asset structure.

Dey, Hossain, and Rahman (2018) investigated the relationship between leverage and company performance among Bangladesh's publicly traded manufacturing businesses. They used two ordinary least squares (QLS) regression models with 816 observations (48 organisations multiplied by 17 years). Financial performance was measured using ROA, ROE, EPS, and Tobin's Q, while financial leverage was determined using the debt-to-equity and debt-to-asset ratios. Their findings confirmed the pecking order concept and other precise analyses, revealing that ROA and Tobin's Q had an inverse relationship with financial leverage. Although there is no correlation between financial leverage and EPS, it is closely tied to ROE.

Effect of Leverage on the Relationship between Liquidity and Profitability

Moghaddam and Abbaspour (2017) conducted a study that examined the effect of financial leverage

and current ratio on the management of capital and earnings. The 14 banks that were listed on the Tehran Stock Exchange between 2010 and 2015 that made up the study's sample were generalized. To assess the hypothesis, the study used multivariate linear regression models. They discovered that the degree of financial leverage and the current ratio directly and significantly influenced how banks handled their profitability.

Silwal (2016) evaluated research on the relationship between liquidity and financial leverage by looking at empirical data from non-financial registered firms in Nepal between 2005 and 2014. Eighteen companies that are listed on Nepali stock exchanges provided samples for the study. Multivariate regression analysis was employed in the study to investigate the connection between financial leverage and liquidity. The independent determinants were liquidity, firm size, and the market to book ratio. The dependent variable in finance was designated as leverage. The study discovered a positive correlation between financial leverage and liquidity.

Jahfer and Madurasinghe (2019) looked at how leverage affects liquidity in their investigation. Only 37 Colombo Stock Exchange companies were selected for the study's sample, which ran from 2009 to 2016. Fixed effect analysis and panel data were employed in the study to evaluate the data. As per the research outcomes, the ratios of capital to liquidity exhibit an antagonistic relationship.

Wolmarans et al. (2013) investigated the relationship between leverage and financial performance using a sample of 96 companies listed on the Johannesburg Stock Exchange (JSE) from 2005 to 2010. Their findings validated the pecking order hypothesis and showed that expenditures are directly related to financial leverage, which is consistent with the trade-off theory (TOT) and the agency cost theory. Finally, the trade-off hypothesis, which anticipated that increasing leverage would raise business profitability, confirms the indirect relationship between liquidity and financial leverage.

2.3 Theoretical Framework

Trade Off Theory

Keynes (1936) stated that businesses require liquidity to cover their existing expenses. They are thus compelled to sell current assets or raise funds through financial markets. With enough cash on hand, you may avoid the transaction costs associated with imperfect capital markets. As a result, the company avoids having to leave profitable activities, limit dividend payments, or liquidate its assets. And this is only one of the many benefits of keeping a large amount of cash.

Similar to debt, cash holdings have advantages and disadvantages but are essential to a company's capacity to fund its potential for growth. Levasseur (1979) asserts that the primary benefit of keeping cash on hand is that it serves as a safety net, allowing companies to finance development opportunities without incurring the costs associated with selling off current assets or raising more funds.

Modigliani (1982) expands on the work of Farrar and Selwyn (1967) by showing that the marginal value of leverage can be affected by the rate of inflation, the rates at which people are taxed on their debt and equity, the company tax rate, and the rates of inflation. The marginal value of leverage, he concludes, is still quite modest in reality, although he thinks it may be fairly sensitive to inflation. When Bradley, Jarrell, and Kim (1984) conducted the trade-off theory's initial empirical test, they discovered contradictory findings. The extreme cross-sectional and temporal variability of the observed debt ratios is also not

explained by the trade-off theory, according to Myers (1984).

3. Methodology

The study employs an expost-facto research design whereby previously collected data is utilized to predict the present behavior of the variable under consideration. Data from the annual financial reports of ten (10) deposit money banks were chosen. The sample for this study was selected based on the available data. To be included in the sample, a bank had to have been listed on the Nigerian Exchange Group (NXG) on or before December 31st, 2009, according to a three-stage filter used in the sample selection process. Furthermore, it has to be quoted between 2010 and 2019 to avoid being delisted. Both descriptive and inferential statistics were used in this study to analyze the data that were gathered. Multiple regression analysis, correlation, and descriptive statistics are used in this study. The selected banks include: Access Banks Plc, Fidelity Bank Plc, First Bank Nigeria Limited, Guaranty Trust Bank Plc, Stanbic IBTC Bank Plc, Sterling Bank Plc, Union Bank of Nigeria Plc, United Bank for Africa, Wema Bank Plc, and Zenith Bank Plc.

3.1 Model Specification

The following are the model for this study: -

$ROA = \beta0 + \beta1_{(LIQ)} + \varepsilon$……..(1)

$ROA = \beta0 + \beta1_{(LEV)} + \varepsilon$……..... (2)

$ROA = \beta0 + \beta1_{(DOL*LIQ)} + \varepsilon$……. (3)

$ROA = \beta0 + \beta1_{(CR)} + \beta2_{(QR)} + \beta3_{(FL)} + \beta4_{(DOL*LIQ)} + \log_{(SZE)} + \varepsilon$…….. (4)

Where: β0…., βk is the regression model coefficients of the independent variables

ROA = Return on Asset ratio of banks which is the proxy for profitability.

CR = Current Ratio.

QR = Quick Ratio.

FL = Financial Leverage.

DCL = Degree of Combine Leverage

SZE = Firm Size

ε = Random error.

Decision rule: null hypothesis should be rejected if the p-value is < 5% significance level, otherwise it should be accepted.

4. Results and Discussion

4.1 Descriptive Statistics

Statistics like mean, maximum, minimum, and standard deviation are computed from all of the observations and are shown in table 1.

Table 1: ***Model Descriptive Statistics***

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
ROA	100	0.103	0.212	-0.522	0.864
CR	100	1.232	0.495	0.304	2.849
QR	100	0.222	0.286	0.014	0.920
DOL	100	0.179	0.150	0.110	0.625
DFL	100	0.113	0.125	0.270	0.543
DCL	100	0.179	0.770	0.304	1.452
FS	100	7.278	0.873	4.936	8.762

Source: *Generated by the researcher using STATA version 17 from annual reports of the sampled listed deposit money banks*

Table 1 shows an average ROA of roughly 0.1028188 by the mean total of the sampled listed deposit money banks with a minimum of -0.5 and a maximum of 0.86.

The CR average is 1.232, and there was a substantial variance from the mean. The minimum and maximum values are 0.304 and 2.849, respectively. The bank was able to fulfill its short-term obligations, as evidenced by the QR, which had an average value of 0.222, a range of 0.014 to 0.920. The operating leverage of the banks was kept within the industry-allowed range as indicated by the DOL, which has an average value of 0.178, a range of 0.11 to 0.624. The sampled mentioned are in compliance with the regulatory requirement and the global best practices, according to the DFL, which has a mean value of 0.113, a range of 0.269 to 0.543. The DCL is 0.178 on average, with a range of 0.304 to 1.452, indicating moderation from the mean. The FS has an average of 7.278.

4.2 Correlation

Table 2 shows the results of the Pearson correlation between the dependent and independent variables.

Table 2: ***Model Correlation Results***

Variable	ROA	CR	QR	DOL	DFL	DCL	FS
ROA	1.0000						
CR	0.1558	1.0000					
QR	0.3900	0.0949	1.0000				
DOL	0.2674	0.6756	0.2260	1.0000			
DFL	0.0580	0.1387	0.3726	0.2549	1.0000		
DCL	-0.0035	0.1188	-0.0034	0.0561	0.0962	1.000	
FS	0.0180	-0.0284	0.1719	0.0331	0.0676	-0.1267	1.0000

Source: *Generated by the researcher using STATA version 17 from annual reports of the sampled listed sample banks*

The relationship between ROA and independent variables CR is weak and positive and the relationship between ROA and QR and DOL is moderate and positive. This means that, all things being equal the lower the CR, QR and DOL the lower the ROA. The relationship between ROA and DFL is very weak and positive while the relationship between ROA and DCL is very weak and negative and it is consistent with the Pecking Order idea, which posited that the amount of a resource is less important than its order in the food chain. ROA and the control variable FS have an extremely favourable relationship.

Table 3: ***Model Regression Results***

Variables	Model 1 (ROA)			Model 2 (ROA)		
	Coefficient	t	P>|t|	Coefficient	t	P>|t|
CONSTANT	-2.2443	-1.96	0.053	-2.1409**	-1.99	0.049
CR	-0.1236**	-2.15	0.032	1.3591**	1.98	0.050
QR	2.0303***	3.98	0.000	0.0979***	4.09	0.000
DFL	2.9623**	2.51	0.013	-0.0474***	-3.28	0.001
LEV*CR	-	-	-	3.1254***	2.94	0.004
LEV*QR	-	-	-	-1.3920**	-2.56	0.011

FS	1.4978191**	2.02	0.046	1.4829**	2.04	0.044
Prob > F	0.0075			0.0005		
F	3.72			4.94		
R^2	0.1353			0.2080		
Adj. R^2	0.0989			0.1658		

Source: *Generated by the researcher using STATA 17 from annual reports of the sampled listed deposit money banks. The asterisks (*) indicate significance: *10%, ** 5%, *** 1%*

The regression analysis's results are shown in Table 3 above. The dependent variable in the model is ROA. The model's multiple coefficients for determinate R^2 is 0.1354%. It follows that changes in the independent variables CR, QR and DFL as well as the control variable FS were responsible for 13.5% of the change in return on assets (ROA). The 86.5% change in ROA was brought on by additional variables that were not taken into account by the model.

In terms of the individual's variable contribution to the model, Table 3 shows that CR(β -0.1236, P< 0.05) is negative and significant at 5% level of significance, whereas QR(β 2.0303, P< 0.01) and DFL (β 2.9623, P< 0.05) were positive and significant at the 1% and 5% level. The result implies variables contribute significantly to increasing the return on assets of listed deposit money banks in Nigeria.

Regarding model II consists of dependent variable Return on Assets (ROA) and independent variables Current Ratio (CR), Quick Ratio (QR) and Degree of Financial Leverage (DFL) and cofounding variable leverage proxy by (DFL) as well as control variables firm size (FS). In the model the multiple coefficient of determinate R^2 is 0.2080%. This means that 20.8% of change in profitability proxy by Return on Asset (ROA) was caused by cofounding on the relationship of independent and dependent variables. The selected leverage proxy shows lurking between liquidity and profitability.

The coefficient value of 3.1254 indicates that the combine effect of DFL*CR on ROA is positive and significant. The impact of combine effect of DFL*QR on ROA is adverse with a coefficient value of -1.3920, and both the positive and negative effects are significant with a P value of 0.000. The positive effect is significant with a P value of 0.004 while the negative is significant with P value of 0.011. Accordingly, the combine effect of leverage and liquidity, as measured by DFL*CR and DFL*QR, has a key role in determining the profitability of listed DMBs, as measured by ROA.

4.3 Test of Hypotheses

H_{01} Liquidity has no significant impact on profitability of listed deposit money banks in Nigeria.

The null hypothesis (H_{01}) is rejected because the p-values of 0.032 and 0.000 for CR and QR are both less than 0.05. We therefore conclude that liquidity has significant effect on the profitability proxy measured by (ROA) of listed deposit money banks in Nigeria at a 0.05 significant level.

H_{02} Leverage has no significant impact on profitability of listed deposit money banks in Nigeria.

The null hypothesis is rejected (H_{02}) due to the p-values of 0.013 of DFL being less than 0.05, which leads to the conclusion that leverage significantly affects the profitability proxy measured by (ROA) of listed deposit money banks in Nigeria at a 0.05

significant level.

H_{03} Liquidity and leverage has combined significant effect on profitability of listed deposit money banks in Nigeria.

The combined effect of liquidity and leverage has no significant impact on profitability proxy measured by (ROA) of listed deposit money banks in Nigeria at 0.05 significant level, as shown by the p-value of 00.004 and 0.011 of DCL, which is less than 0.05.

4.4 Discussion of Findings

The examination of the data revealed a strong correlation between the profitability of listed Deposit Money Banks (DMBs) as assessed by Return on Assets (ROA) and liquidity as evaluated by the Current Ratio (CR) and Quick Ratio (QR). According to the results, QR has a positive and large impact on ROA while CR has a negative and significant impact. This shows that the profitability of the listed DMBs is affected by liquidity, as represented by CR and QR this is consistent with the study of (Durrah, Abdul, Syed, and Nour 2016) who found positive and significant relationship between liquidity and profitability and contrary to the study of (Onofrei, *et al.*, 2015; Sattar, 2020). The study suggests that Deposit Money Banks (DMBs) should manage their liquidity to increase profitability.

The analysis of the results indicates that the effect of leverage proxy by Degree of Financial Leverage (DFL), on profitability, as measured by Return on Assets (ROA) of Deposit Money Banks (DMBs) is positive and significant. The findings suggest that DMBs' profitability is significantly determined by their leverage, and therefore, leverage is a relevant factor in determining DMBs' profitability. This is in line with the study of (Ramli et al. 2018) and contrary to the study of (Dakua 2019; and Dey, Hossain, and Rahman 2018). The findings imply that leverage is an important consideration when estimating Deposit Money Banks' (DMBs') profitability

The results of the investigation revealed that the profitability of listed Deposit Money Banks (DMBs) in Nigeria had significant influence from the combined effect of leverage and liquidity, as determined by the Degree of Financial Leverage (DFL) and Current Ratio (CR) and Degree of Financial Leverage (DFL) and Qucik Ratio (QR). The influence of combined leverage and liquidity on profitability is statistically significant. Therefore, it can be said that combined leverage and liquidity has a bearing on how profitable DMBs are. This is in line with the study of (Moghaddam and Abbaspour 2017 and Silwal 2016) and trade-off theory and contrary to the studies of (Wolmarans, Moyo and Brummer, 2013; and Jahfer and Madurasinghe 2019).

5. Conclusion and Recommendations

The study shows a strong relationship between liquidity and profitability in listed Deposit Money Banks (DMBs). The Quick Ratio has significant effect on Return on Assets, while the Current Ratio emphasizes the importance of maintaining current assets quality. Leverage and liquidity significantly impact DMBs' financial performance. Considering the findings from this study, the following recommendations are proffered for Deposit Money Banks (DMBs) and regulators in Nigeria:

i. Deposit Money Banks should maintain a balance between liquid assets and liabilities to maximize liquidity, closely monitoring Quick Ratio and Current Ratio to effectively use current assets for immediate obligations.
ii. DMBs should adjust leverage ratios to maximize profits while maintaining financial stability, balancing debt and equity, and

regularly monitoring liquidity and leverage ratios to handle volatile market conditions.

iii. DMBs should manage financial leverage and liquidity independently, considering individual impacts on profitability. Balancing risk and return trade-offs can enhance profitability without exposing DMBs to excessive risks.

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