Capital Adequacy and Return on Equity of Deposit Money Banks in Nigeria

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Abstract

Although the Central Bank of Nigeria (CBN) had in the past fifteen years (2005 – 2021) introduced several banking reforms, mainly aimed at increasing the capital base of banks, the deposit money banks are constantly faced with the problems of under-capitalization due to capital-to risk weighted average ratio, insolvency and low qualifying capital balances among others. Hence, this study empirically examined the effect of capital adequacy on return on equity of deposit money banks in Nigeria (2004 – 2022). Capital adequacy was proxied by Total qualifying capital (TQC)), adjusted shareholders fund (tier 1 capital) (ASF)) and capital to risk-weighted asset ratio (CRW) and return on equity (ROE)) which formed the specific objectives of the study. In order to actualize the objective, the study adopted quasi experimental design. The data were sourced from NDIC annual financial statistical bulletin. The data were subjected to inferential such as ADF unit root test, Granger causality test, ARDL model. The result revealed that, total qualifying capital has significant influence on return on equity of money deposit banks in Nigeria. Also, adjusted shareholders fund has significant effect on return on equity of money deposit banks in Nigeria. Capital to risk-weighted ratio was statistically significant and positively related to return on equity of money deposit banks in Nigeria. In conclusion, capital adequacy has significant effect on return on equity of deposit money banks in Nigeria. The researcher recommended that shareholders' return requirements should be balanced against the capital requirements of the regulators, the expectations of debt investors, customers and other counterparties as regards the bank's rating, and the economic capital that represents the total risk of the bank.

Keywords: *Capital Adequacy, Return on Equity, Deposit Money Banks*

INTRODUCTION

Shareholders' wealth maximization has been one of the primary objectives of corporate organization globally. And, it is imperative that the profitability and good financial performance of banks that promote wealth maximization strives when banks identify inherent risks and strategically prioritize capital adequacy management. Shareholders' equity maximization occurs when there is an increase in the value of the firm's common stock

which is considered the most important business objective over profit maximization (Ezelibe & Aniefor, 2017). Profitability being one of the cardinal principles of bank lending acts as a game changer for the survival and success of private sector banks in Nigeria. In order to stay profitable, banks have to capitalize on every penny advanced to yield the expected returns. However, considering the constraints lay down by the Reserve Bank of Nigeria, banks have to maintain a minimum capital adequacy ratio, as per the current BASEL III regulations active in Nigeria. Moreover, the world financial system has witnessed considerable economic turbulence over the last two decades based on the concurrent review of capital adequacy structure of banks. This is because the survival of any financial organization in this tensed competitive environment lies in its ability to maintain sustainable capital in order to meet-up demand which invariably enhance performance and increase competitive advantage and economy tenet of the country.

Capital adequacy position of a bank on a stand-alone (solo) level measures its capital strength and risk profile. capital adequacy is defined as the amount of equity capital and other securities which a bank holds as reserves against risky assets as a hedge against the probability of bank failure. It takes into consideration a bank's global operations including its foreign subsidiaries and overseas branch operations, on a stand-alone basis (CBN, 2021). It also refers to the extent to which the assets of a bank exceed its liabilities, and is thus a measure of the ability of the bank to withstand a financial loss. Capital adequacy in banking business gives protection against sudden financial losses (Al-Sabbagh, 2014). According to the Capital Adequacy Standard set by Bank for International Settlements (BIS, 2019), banks must have a primary capital base equal at least to eight percent of their assets. As stated by Oyinpreye (2016), the power of any bank depends on the capital adequacy. A bank's capital is the detachment value of a bank to the current value of its future net income. Capital adequacy measure the level of solvency for the bank, it indicates whether a bank has absolute capital to help the danger in its balance sheet. A larger bank are always has advantage over little banks for handling the measurement of economies in businesses and will tend to have more profit (Haruna, 2015). Capital adequacy ratio is an important measure of "safety and soundness" for banks and depository institutions because it serves as a buffer or cushion for absorbing losses. Thus, it has become one of the major benchmarks for financial institutions.

Inadequate working capital and surplus working capital are both severe situations. The consequence, relative to its peers in other nations of the western world, is the underperformance of the Nigerian banking sector. A bank's success depends on its capacity to successfully handle the risks of liquidity and profitability that firms face in the management of working capital, according to Umoren & Udo (2015). Capital adequacy management is essential for determining the efficiency of a bank. By fulfilling deposit withdrawal requests, a bank must satisfy its financial commitments to clients. Notably, it has to invest its funds appropriately in valuable assets. From the twenty-four (24) deposit money banks in Nigeria, ten (10) of them were deemed distressed and doubtful by the Central Bank of Nigeria as of 2009. The reasons were related to liquidity issues, capital inadequacy and lack of proper risk management procedures (Umoren & Udo, 2015). A study conducted on the dissolved Skye Bank, claimed that the key causes of its dismal results were capital insufficiency and illiquidity. These contributed to the bank's inefficient capital operations, which led to its inability to fulfill obligations when they were due and ultimately had a significant impact on its performance and outcome. Although the Central Bank of Nigeria (CBN) had in the past fifteen years (2005 – 2021) introduced several banking reforms, mainly aimed at increasing the capital base of banks, the deposit money banks are constantly

faced with the problems of under-capitalization (capital-to risk weighted average ratio), insolvency, high level of non-performing loans and weak corporate governance among others. From the background of this study, it is pertinent to research the effect of capital adequacy on return on equity of deposit money banks in Nigeria.

LITERATURE REVIEW

Concept of Capital Adequacy

Capital adequacy ratio is an important measure of "safety and soundness" for banks and depository institutions because it serves as a buffer or cushion for absorbing losses (Abba, Zachariah & Inyang, 2013). Capital is adequate either when it reduces risk of future insolvency to some predetermined level or when the premium paid by the bank to an insurer is "fair"; that is, it covers the expected losses of the insurer, given the risk and capital of the firm and the terms of insurance with respect to when insolvency will be determined and what losses will be paid (Basel III, 2010). As stated by Al-Sabbagh (2014), capital adequacy is defined as a measure of bank's risk exposure. Banks risk is classified into credit risk, market risk, interest rate risk and exchange rate risk that are included in the calculation of capital adequacy ratio. It has become impossible to discuss the concept of capital adequacy ratio in the banking industry without referring to value at risk (VaR). The 'capital adequacy' principle states that bank's capital should match risks. Since capital is the most scarce and costly resource, the focus of risk monitoring and risk measurement follows. The central role of risk-based capital in regulations is a major incentive to the development of new tools and management techniques. Undoubtedly a most important innovation of recent years in terms of the modelling 'toolbox' is the VaR concept for assessing capital requirements. The VaR concept is a foundation of risk-based capital or, equivalently, 'economic capital' (Bessis, 2012). The VaR methodology aims at valuing potential losses resulting from current risks and relies on simple facts and principles. VaR recognizes that the loss over a portfolio of transactions could extend to the entire portfolio, but this is an event that has a zero probability given the effective portfolio diversification of banks.

Total qualifying capital

Total qualifying capital means Tier 1 capital plus Tier 2 capital, less: investments in and loans to unconsolidated financial subsidiaries; investments in the capital of other financial institutions; encumbered assets (assets acquired using capital funds but subsequently pledged to secure loans or that are no longer available to cover losses from operations); and reciprocal holdings of capital instruments of banks. These capital instruments must have an original weighted average maturity of at least five years and otherwise be eligible for inclusion in Tier 2 capital as discussed in the risk-based capital guidelines. Total qualifying capital (i.e., Tier 1 and Tier 2 capital) allowable under the risk-based capital guidelines. Report the amount of total capital, that is, Tier 1 plus Tier 2 capital less deductions that is allowable under the risk-based capital guidelines (sum of items 1 and 2). Tier 1 capital identifies the main components of equity capital: shares, unavailable balance sheet reserves, and shareholders' retained earnings, accrued over the life of the bank. It represents the amount of capital that allows a bank to absorb losses without affecting interests of depositors. Tier 2 capital is the sum of upper Tier 2 capital and lower Tier 2 capital. The total amount of upper and lower Tier 2 capital both before deductions enumerated in paragraph 10 that may be included in total qualifying capital shall be limited to a maximum of 100% of total Tier 1 capital (net of

deductions enumerated).

Capital-to risk weighted average ratio

In an economic sense, bank capital consists of the value of equity owned by shareholders. Bank economic capital can be defined as the value of the equity of a bank that can withstand losses. It has the lowest priority if the bank liquidates. Although there are several types of equity instruments (for example, common stock, contributed capital, and retained earnings), equity consists mainly of the profits retained by a bank or obtained from selling shares to investors. However, measuring equity is not simple because its value depends on how all financial instruments and on and off–balance sheet assets of banks are valued (Ezu *et al*., 2023). Equity measured by its book value reflects the assets and liabilities that a bank reports on its balance sheet, thereby ignoring most off–balance sheet items and providing a historical accounting value rather than a current one. Equity measured by its market value reflects the value of the bank according to the stock market.

It has become impossible to discuss the concept of capital adequacy ratio in the banking industry without referring to value at risk (VaR). The 'capital adequacy' principle states that bank's capital should match risks. Since capital is the most scarce and costly resource, the focus of risk monitoring and risk measurement follows. The central role of risk-based capital in regulations is a major incentive to the development of new tools and management techniques. Undoubtedly a most important innovation of recent years in terms of the modelling 'toolbox' is the VaR concept for assessing capital requirements. The VaR concept is a foundation of risk-based capital or, equivalently, 'economic capital' (Marcus, 2019). The VaR methodology aims at valuing potential losses resulting from current risks and relies on simple facts and principles. VaR recognizes that the loss over a portfolio of transactions could extend to the entire portfolio, but this is an event that has a zero probability given the effective portfolio diversification of banks. Therefore, measuring potential losses requires some rule for defining their magnitude for a diversified portfolio. VaR is the upper bound of losses that should not be exceeded in more than a small fraction of all future outcomes. Management and regulators define benchmarks for this small preset fraction, called the 'confidence level', measuring the appetite for risk of banks. Economic capital is VaRbased and crystallizes the quantified present value of potential future losses for making sure that banks have enough capital to sustain worst-case losses. Such risk valuation potentially extends to all main risks.

Bank capital regulation in Nigeria

The prime regulatory body for financial institutions in Nigeria is the Central Bank of Nigeria. The Central Bank of Nigeria was established in 1958. Its principal objects are to:

i. issue legal tender currency in Nigeria;
ii. maintain external reserves to safeguard the international value of the Nigerian currency;
iii. promote monetary stability and a sound financial system in Nigeria; and
iv. act as banker and financial adviser to the Federal Government.

The promotion of monetary stability is a prerequisite for a sound financial system, and indeed, for the economic development of any country (Ogowewo & Uche, 2006). Prior to its establishment, monetary activities were overseen by the West African Currency Board (WACB), which was established in 1912 with headquarters in London. The WACB was

charged essentially to provide for and to control the supply of currency to the British West African Colonies, Protectorates and Trust Territories. Even though WACB was not a monetary authority in the strict sense of the word and has various limitations, the colonial government was reluctant to replace it with a central bank. According to Ogowewo and Uche (2006), the Bank of England feared that central banks in newly independent developing countries might be unable to adhere to sound principles of monetary system management, especially when exposed to political pressures. According to them, the Bank of England was in no doubt keen to avoid the mistakes of the past where several central banks collapsed in Europe in the early 20th century. Eventually, with passage of time, it became obvious to the Bank of England that political independence and central banking were inexorably linked, it reluctantly conceded. The Bank of England, however, ensured that enough safeguards were put in place to prevent political interference and ensure monetary stability in post-independence of Nigeria.

Concept of Return on Equity (ROE)

The study adopted Return on Equity (ROE) as a measure of profitability in banks because ROE measures how profitable and efficient the management of a bank is in using the bank's total assets in generating income. Return on Equity (ROE) is a ratio between net profit and total equity measuring the profitability of the shareholders' investments. This ratio depends on profit margin, financial leverage and speed assets. Return on equity (ROE) is the profitability ratio to measure the company ability to generate profit based on share capital owned by the company. According to Fahmi (2015) the ratio of Return on Equity is also known as return on equity. This ratio examines the extent to which a company uses its resources to be able to provide a return on equity. Return on equity can be used to determine the success of management in managing the company's capital in providing returns to shareholders, the higher this ratio the better because it provides a greater rate of return to shareholders. Several factors can increase Return on Equity, namely:

a) increasing sales without proportionally increasing expenses and costs,
b) reducing the cost of goods sold or operating expenses of the company,
c) increasing sales relatively on the basis of asset value, either by increasing sales or reduce the amount of investment in selling assets,
d) increase the use of debt relative to equity, to a point that does not jeopardize the financial well-being of the company (Fahmi, 2015).

The increase in the Return on Equity ratio from year to year in the company means that there is an increase in the net profit of the company concerned, which will cause stock prices, which also means an increase in the value of the company. But the Return on equity (ROE) is the amount of net income returned as a percentage of shareholders equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested (Fahmi, 2015).

Role of deposit money banks (DMBs) in Nigeria:

The activities of the banking sub-sector have dominated the Nigerian financial system (Adeyemi, 2017: Akpan, 2010). The economy of any country depends on banking as it contributes to the economic development of the country. According to Santos (2009), their roles include; inculcation of banking habits to the populace; mobilization of savings for investment purposes: which is achieved through keeping savings, fixed deposit and current

accounts for customers; channeling resources from surplus economic units to the deficit economic units for investment purposes. This consists of the provision of loans and advances to the private and public sectors for various and for the growth of domestic output and promotion of the export trade, agricultural production and provision of infrastructure. DMBs assist the government in the implementation of monetary and credit policies, provision of short-term and long-term credit to the public sector, serving as channel for implementing the various bilateral and multilateral trade agreements and policies, constituting avenues for the provision of various finance schemes designed to revamp the economy, providing advisory services, ensuring project conception and management, investment management, acting as agents to the government for dealing in foreign exchange, enhancing international trade, conducting brokerage services i.e. buying and selling of stocks for their clients thereby assisting in the development of the capital market and promotion of investment culture which lead to economic growth and development.

Theoretical Review

The study anchors on Buffer theory of capital adequacy states the regulatory minimum capital ratio that banks need to maintain for survival.

Buffer theory of capital adequacy

The buffer theory as propounded by Calem and Rob (2016) predicted that, a bank approaching the regulatory minimum capital ratio may have an incentive to boost capital and reduce risk in order to avoid the regulatory costs triggered by a breach of the capital requirements. However, poorly capitalized banks may also be tempted to take more risk in the hope that higher expected returns will help them to increase their capital. This is one of the ways risks relating to lower capital adequacy affects banking operations. In the event of bankruptcy of a bank, the risks are absorbed by the bank, customers and Nigeria Deposit Insurance Corporation (NDIC). At present, NDIC pays a maximum of ₦200,000 to a customer in the event of bank failure. Hence, customers are concerned about capital position of banks at all time. Banks are expected to insure and pay 15/16 of customers deposit liabilities multiplies by 1 percent to NDIC to enable their customers benefit from the scheme. The above practice of NDIC in Nigeria is applicable to other countries but varies in amount. As a consequence, banks may prefer to hold a buffer of excess capital to reduce the probability of falling under the legal capital requirements, especially if their capital adequacy ratio is very volatile. Capital requirements constitute the main banking supervisory instrument in Nigeria. By contrast, a breach of the capital requirements is considered a major infringement of banking legislation and is not tolerated by the CBN. Banks remaining undercapitalized for prolonged periods are closed. The withdrawal of some banking license at the expiration of the recent capitalization of banks in Nigeria in 2005 is a pointer to this fact. Banks will require more capital if deposits are not fully mobilize from the public. Capital is more reliable, dependable and can be used for long term planning. Ability of banks to mobilize enough deposits obviates the capital base from being eroded.

Review of Empirical Studies

Ismaila, Nuraddeen and Murtala (2022) investigated determinants of financial performance of listed DMBs in Nigeria for ten years from 2011-2020. The study adopts the correlation design so that to correlate the relationship between variables. The population of this study comprises the Seventeen listed deposit money banks in Nigeria as at 31 December, 2020. The

audited annual reports were obtained from Nigerian stock exchange. The result provides evidence Bank size, Capital adequacy ratio and Income diversification have insignificant impact return on assets of the banks. In the determining the effects of moderating impact on firm age is that Capital adequacy ratio, Bank size, Income diversification has a statistically insignificant influence on the return on assets of listed deposit money banks in Nigeria. Based on the findings, the bank management should also continue to put policies and strategies in place to ensure effective management of bank size and efficiency for increased profitability, on the other part.

Mbaeri, Uwalake and Gimba (2021) examined the effect of capital adequacy ratio on the performance of listed commercial banks in Nigeria proxied by return on capital employed from 2014-2019. Data for this study, collected from the sampled commercial banks annual financial reports for the period covered, were analysed using panel regression. The study found that capital adequacy ratio had significant and positive effect on return on capital employed of listed commercial banks in Nigeria. Based on this finding, the Central Bank of Nigeria is advised to increase the Capital Adequacy Ratio of commercial banks and ensure that they are complied with. This is expected to bring about improved performance of the banking sector.

Sani and Muhammad (2021) assessed the relationship of capital adequacy and financial performance of deposit money banks in Nigeria. This study employed regression technique on annual secondary data sourced from audited financial statements of the fourteen (14) selected Deposit Money Banks to examine the relationship between capital adequacy and performance of Deposit Money Banks in Nigeria during 2011 through 2018. The study used return on assets (ROA) and returns on equity (ROE) as alternative proxies for performance of Deposit Money Banks and also serve as dependent variables, while capital adequacy ratio was the independent variable. The regression results show that, the estimated coefficient for capital adequacy ratio (CAR) when ROA serves as the dependent variable is 0.148 and positively significant at 10% level of significance. On the other hand, the estimated coefficient for capital adequacy ratio (CAR) when ROE serves as the dependent variable is 0.886 and also positively significant at 1% level of significance. The study suggests that capital adequacy ratio exhibits significant positive relationship with Deposit Money Banks performance proxied alternatively with return on assets (ROA) and return on equity (ROE) within the study period.

METHODOLOGY

A study methodology refers to the overarching strategy, methods and rationale used for conducting research. *Quasi experimental* research design approach was adopted for the study. *Quasi experimental* study or after-the-fact research is a category of research design in which the investigation starts after the fact has occurred without interference from the researcher. Data for the study was time series secondary data from NDIC Annual financial statistical bulletin. The data for this study were bank total qualifying capital, adjusted shareholders fund (tier 1 capital) and capital-to risk weighted average ratio as independent variables while return on equity was used as dependent variable of the study. The data were subjected to unit root test, granger causality test. The study adopted Error Correction Model analysis for a period of 18 years, annual data covering 2004 – 2022 as the main tool of analysis. The study modified and adapt the model of Ismaila, Nuraddeen and Murtala (2022) and Sani and Muhammad (2021). Since the methodology allowed comprehensive information about the dynamics of the interactions, long-term trends are easily explained. This enables shocks

within the regressions and the system to be easily seen. The study models are specified as follows:

ROE = *f* (TQC, ASF, CRW)…… (3.1)
Transforming equation 3.1 to 3.2 to *econometrics model*
ROE =α +β_1TQC+ β_2ASF+ β_3CRW+μt…… (3.2)
Where; α_o = Constant, β_1 - β_3 = Co-efficient of independent variables, μt = Error term
ROE = Return on equity (%), TQC = Total qualifying capital (₦),
ASF = Adjusted shareholders fund (tier 1 capital) (₦)
CRW = Capital-to risk weighted average ratio (%)
$\beta_1 > 0$, $\beta_2 < 0$, $\beta_3 > 0$ apriority expectations

ANALYSIS AND DISCUSSION OF FINDINGS

Econometric Analysis

i. Stationary Test

The researcher subjected the data to stationarity test since time series data are prone to stationarity problems. To avoid having a spurious result, our data is subjected to unit root test using Augmented Dickey-Fuller unit root test thus; the variables were found to be stationary at first difference.

Table 1: Presentation of Augmented Dickey-Fuller unit root test

Variables	ADF- statistics	Prob.	Order of integration
TQC	-4.606324	0.0027	stationary at level *I*(1)
ASF	-4.741123	0.0021	stationary at level *I*(1)
CRW	-3.363817	0.0278	stationary at level *I*(0)
ROE	-4.595417	0.0025	stationary at level *I*(1)

Source: Compiled by Researcher from Appendix E-View 12

Augmented Dickey-Fuller unit root test was adopted for the study to analyze the stationary level of data collected from the NDIC annual statistical bulletin in Nigeria. The unit root test was carried out to test whether the variables are integrated. The results on the Augmented Dickey-Fuller unit root test as shown in Table 4.2 indicates that all the logged variables of Total qualifying capital (TQC)), adjusted shareholders fund (tier 1 capital) (ASF)) and return on equity (ROE)) with high negative t-statistic coefficients are statistically significant at 1 percent and integrated at ordinary level and first difference respectively. The negative t-statistic coefficients of capital to risk-weighted asset ratio (CRW)) also have high negative coefficient and significant at 5% level of significance. The variables are all integrated and stationary at ordinary level and 1st deference with probability values of less than 5% level of significance. The variables are therefore co-integrated. As such, they all accepted the null hypothesis of stationary.

Table 2: Presentation of causation and forecasting test result

The result of the pair-wise Granger Causality tests between the capital adequacy and DMBs performance component (return on equity) are presented in Table 2

Pairwise Granger Causality Tests
Date: 09/26/23 Time: 18:06
Sample: 2004 2022
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
ASF does not Granger Cause TQC	17	1.54786	0.2523
TQC does not Granger Cause ASF		2.39849	0.1330
CRW does not Granger Cause TQC	17	1.34435	0.2973
TQC does not Granger Cause CRW		2.08674	0.1668
ROE does not Granger Cause TQC	17	0.84299	0.4544
TQC does not Granger Cause ROE		2.97771	0.0891
CRW does not Granger Cause ASF	17	1.30626	0.3067
ASF does not Granger Cause CRW		2.03050	0.1740
ROE does not Granger Cause ASF	17	0.72558	0.5041
ASF does not Granger Cause ROE		3.43612	0.0661
ROE does not Granger Cause CRW	17	0.21346	0.8108
CRW does not Granger Cause ROE		4.81557	0.0291

Source: E-view computation result

From the result of the pair wise Granger causality reported above, it can be seen that; there is no causality running from TQC and ASF to ROE to because their respective prob (F-statistic) of 0.0891 and 0.0661 were greater than 0.05. However, there is causality running from CRW to ROE to because the prob (F-statistic) value of 0.0291 was less than 0.05. Hence, TQC and ASF shows there is no causality running from any of the capital adequacy components to return on equity, apart from CRW. The result of the causation and forecasting test shows that all-time series do not share mutual stochastic trend as there exist no casualty equation judging by their probability value and the ranking order. This therefore implies that TQC and ASF have no long run relationship to ROE, while CRW to ROE revealed that there is a long run relationship and causality between the variables employed.

ARDL co-integration analysis for ROE $=\alpha+\beta_1$TQC$+\beta_2$ASF$+\beta_3$CRW$+\mu t$

Table 4.9: **ARDL co-integration analysis**

Dependent Variable: ROE
Method: ARDL
Fixed regressors: C
Number of models evalulated: 54
Selected Model: ARDL(2, 0, 2, 1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
ROE(-1)	-0.825481	0.247135	-3.340201	0.0102
ROE(-2)	0.132913	0.132826	1.000651	0.3463
TQC	0.079166	0.014745	5.385080	0.0008
ASF	-0.189119	0.160729	-1.176631	0.2732
ASF(-1)	-0.006321	0.083922	-0.075321	0.9418
ASF(-2)	0.179735	0.052969	3.393190	0.0095
CRW	0.399064	0.154323	2.585904	0.0323
CRW(-1)	0.298867	0.110661	2.700730	0.0270

C	-0.797213	0.162543	-4.904616	0.0012

R-squared	0.917755	Mean dependent var	0.125118
Adjusted R-squared	0.835510	S.D. dependent var	0.055001
S.E. of regression	0.022307	Akaike info criterion	-4.462782
Sum squared resid	0.003981	Schwarz criterion	-4.021669
Log likelihood	46.93365	Hannan-Quinn criter.	-4.418935
F-statistic	11.15877	Durbin-Watson stat	2.163360
Prob(F-statistic)	0.001306		

*Note: p-values and any subsequent tests do not account for model selection. T-tab = 2.120

Source: E-Views 12 computations

The result of the unit root test established that the data are stationary of the order 1(0) and 1(1), the researcher proceed to apply the ARDL co-integration technique to verify the existence of long-run co-integrating relationship between the indicators of capital adequacy variables and the bank performance (ROE) measures. The coefficient of total qualifying capital was positive and statistically significant at 5 percent probability level. This implies that in unit increase in total qualifying capital leads to 0.0791unit increase in bank performance (ROE) of deposit money. As reflected in the result, total qualifying capital has a t-cal value of 5.385 which is greater than 2.120 tabulated value at 0.05 degree of freedom. In effect, since the t-calculated value is greater than the t-tabulated value in absolute terms, the researcher rejected null hypothesis in favour of alternate hypothesis stating that, total qualifying capital has significant influence on return on equity of money deposit banks in Nigeria.

The estimated value of adjusted shareholders fund was statistically significant and positively related to return on equity of money deposit banks in Nigeria at 1 percent probability level in a long run. This signifies that in unit increase in adjusted shareholders fund leads to 0.1797 unit increase in return on equity of money deposit banks in Nigeria. The result also indicated that, adjusted shareholders fund has a t-cal value of 3.3931 which is greater than 2.120 tabulated value at 0.05 degree of freedom. In effect, since the t-calculated value is greater than the t-tabulated value in absolute terms, the researcher rejected null hypothesis in favour of alternate hypothesis stating that, adjusted shareholders fund has significant effect on return on equity of money deposit banks in Nigeria.

Capital to risk-weighted ratio was statistically significant and positively related to return on equity of money deposit banks in Nigeria at 5 percent probability level. The coefficient of capital to risk-weighted ratio of 0.399, revealed that, a unit increase in capital to risk-weighted ratio, holding other variables constant, will lead to increase in return on equity of money deposit banks in Nigeria by 0.399 units in a long run. From the result, since the capital to risk-weighted ratio has a t-cal value of 2.7007 which is greater than 2.120 tabulated value at 0.05 degree of freedom. Thus, return on equity of money deposit banks in Nigeria will increase by 0.399 units, if the studied banking firms increases their capital to risk-weighted ratio by a unit.

The coefficient of multiple determination (R^2) was 0.9177, which implies that 91.7% changes

in the dependent variable was explained by changes in the independent variable, while 8.3% was unexplained by stochastic terms in the model. Thus, the independent variable capital adequacy (total qualifying capital, adjusted shareholders fund (tier 1 capital), capital to risk-weighted ratio) can only explain 91.7 percent of changes in return on equity of money deposit banks in Nigeria, leaving 8.3% unexplained. The R^{-2} adjusted was 83.5% indicating a goodness of fit of the ARDL model adopted in this study which is statistically significant at 5% probability level. The Durbin-Watson statistical value of 2.163 was observed which falls within 1.8 to 2.5, implying that there is no evidence of autocorrelation in the data analysis. More so, the f-statistical (calculated) value of 46.9336 was observed in the analysis which is greater than 2.120 t-table value; and f-probability value of 0.000 was observed from the analysis which is less than 0.05 (95% of freedom), indicating that estimated regression model adopted in this study is statistically significant at 5% level. With this, the researcher rejected the null hypotheses and accept alternative hypothesis hence, total qualifying capital, adjusted shareholders fund (tier 1 capital), capital to risk-weighted ratio have significant effect on return on equity of money deposit banks in Nigeria. The result is in accordance with the result of Ezike (2013) who empirically examined capital adequacy standards and performance in the Nigerian banking sector. The findings showed that capital adequacy standards exert a major influence on bank performances. Additionally, Rose and Hudgins (2005) suggested that recapitalization may raise liquidity in short term but does not guarantee conducive macroeconomic environment needed to ensure good profitability and high asset quality. Therefore, profitability and asset base are the two traditional measures used to gauge bank performance in Nigeria.

Summary of Results

This study empirically examined the effect of capital adequacy on return on equity of deposit money banks in Nigeria (2004 – 2022). The result revealed that, total qualifying capital has significant influence on return on equity of money deposit banks in Nigeria. Also, adjusted shareholders fund has significant effect on return on equity of money deposit banks in Nigeria. Capital to risk-weighted ratio was statistically significant and positively related to return on equity of money deposit banks in Nigeria.

Conclusion

Capital adequacy ratio is one of the important concepts in banking as it measures the amount of a bank's capital in relation to the amount of its risk weighted credit exposures. In conclusion, the study has provided both empirical and statistical evidence on the relationship between capital adequacy ratio and banking risks in the Nigerian banking industry using three independent variables. The findings of the study are total qualifying capital has significant influence on return on equity of money deposit banks in Nigeria. Also, adjusted shareholders fund has significant effect on return on equity of money deposit banks in Nigeria. Capital to risk-weighted ratio was statistically significant and positively related to return on equity of money deposit banks in Nigeria. Hence, Nigerian banks should adopt a risk-based approach, paid-up capital and retained earnings in managing capital as there is significant relationship between capital adequacy ratio and shareholder's equity banking sector. More so, bank's capital policy should define how capital management should support the business goals.

Recommendations

In line with the findings of this study, the researcher recommended the following:

1. Shareholders' return requirements should be balanced against the capital requirements of the regulators, the expectations of debt investors, customers and other counterparties as regards the bank's rating, and the economic capital that represents the total risk of the bank.
2. The management of deposit money banks in Nigeria should give adequate attention to capital management component, especially total qualifying capital and emphasize on optimal working capital levels in their bank bearing in mind the position significant relationship between total qualifying capitals on return on equity.
3. The management of deposit money banks should develop necessary steps to utilize their idle cash and bank balances in order to meet their short-term debt obligations and operating cost without violating the regulatory minimum capital to risk-weighted asset ratio set by the Central Bank of Nigeria.

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