

# Effect of Capital Adequacy, Bank Size and Liquidity on the Stability of FUGAZ Bank in Nigeria

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**Abstract:** *The study scrutinized the effect of capital adequacy, bank size and liquidity on the stability of FUGAZ banks in Nigeria as of 2013 to 2021 (9years). The study made use of cross sectional data which were sourced from the bank's annual report reviewed. The study anchored on the theory of portfolio regulation. The design adopted for this study is ex post factor. The study data was regressed by the use of multiple regression (OLS) using the 9<sup>th</sup> version of econometric views. From the analysis carried out the results revealed that CAR has positive and insignificant effect, BSI and LIQ has negative and insignificant effect on Z-Score of FUGAZ banks in Nigeria. Base on the findings, this study acclaims that Bank administrators should make sure that they keep up capital that is sufficient to enable them absorb shock in order to be outstanding. Likewise banks should ensure their asset size is large enough to absorb their liabilities.*

**Keywords:** FUGAZ, Portfolio Theory, Z-score

## 1. INTRODUCTION

Despite the implementation of several reforms and policies to protect and enhance financial stability of banks and prevent bank let-down, the issue of bank stability still constitute discuss in the field of finance. Several factors determine the operational effectiveness and efficiency of financial institution (banks): these factors are embedded in how well they manage their assets and liabilities. The asset of bank are those it own while liabilities are its obligations to stakeholders. Banks are required by law to hold minimum capital that will enable that stay safe and meet obligation to their customers and other stakeholders. Capital adequacy (CA) refers to the minimum capital bank are required to maintained. Ongore and Kusa (2013) stated that CA is the suitable amount of capital a bank or other financial intermediary must have for the conduct of its business as specified by its regulatory authority to enable it survive the risks it is exposed to and absorb losses without putting depositors at risk. Odunayo and Joseph (2016) opined that capital adequacy is engrained in the reordering of the existing capital structure of banks to alleviate wide spread distress. A bank can be said to be efficient if its asset size at weigh its liabilities but the reverse is the case for banks with low asset size. Capital meagreness is a strong indicator of distress situation in any business (Ebhodaghe , 1996).

Bank stability (BST) has to do with its survival notwithstanding challenges facing the economy the bank operates. For banks to survive despite unforeseeable circumstance there is need for them to ensure that their capital base, bank asset and Liquidity are put on check.

According to Roman and Sargu (2013), the CAMELS framework which stands for Capital adequacy, Asset quality, Management quality, Earnings ability, Liquidity, and Sensitivity is used to evaluate and control banks in order to identify and address potential vulnerabilities. This framework is used to promote a safe and stable banking system.

In Nigeria there are up to twenty four commercial banks comprising those with international, national and regional authorisation to carryout commercial banking business in Nigeria. Of the aforementioned banks five of them are classified as those with highest market capitalisation, total assets, gross earnings and profit after tax namely (First Bank of Nigeria Holdings, United Bank of Africa, Guarantee Trust Company, Access Bank and Zenith Bank).

Several literatures have capture the effect of capital adequacy estimates, liquidity of banks and the Size of banks on how it affects financial stability of banks i.e ( Ezike, J.E. 2013; Bateni, Vakilifard & Asghari, 2014; Alemu, 2015; Odunayo and Joseph 2016) . Of the literatures stated some bank used BSI and LIQ as proxied to measured performance and stability of banks other than FUGAZ banks. This study therefore aim to determine particularly if CAR, BSI and LIQ have an effect on the stability (Z-score) of FUGAZ banks in Nigeria for the period reviewed.

### 1.1 Objective of the Study

The primary object of the study is to investigate the influence of capital adequacy, bank size and liquidity on the stability of FUGAZ banks in Nigeria. Whereas the specific objectives are:

- i To explore the effect of capital adequacy ratio (CAR) on the stability of FUGAZ bank in Nigeria
- ii To determine the effect of bank size (BSI) on the stability of FUGAZ bank in Nigeria
- ii To examine the effect of liquidity (LIQ) on the stability of FUGAZ bank in Nigeria

### 1.2 Research Questions

The following research question was raised:

- i To what magnitude does CAR affect the stability of FUGAZ bank in Nigeria?
- ii To degree do bank size (BSI) affect the stability of FUGAZ bank in Nigeria?
- ii To what point does liquidity (LIQ) affect stability of FUGAZ bank in Nigeria?

### 1.3 Hypotheses

The following research hypotheses was articulated:

- i CAR has no significant effect on the stability of FUGAZ bank in Nigeria
- ii BSI has no significant on the stability of FUGAZ bank in Nigeria
- ii LIQ has no significant on the stability of FUGAZ bank in Nigeria

## 2. REVIEW OF RELATED LITERATURES

### 2.1 Conceptual Framework

#### 2.1.2 Capital Adequacy (CAD)

Nzotta (2004) stated that CAD represents the amount of capital resources a bank owns for its operations, in line with the level of risk and risk assets the bank is holding. Yusuf and Umar (2021) opined that CAD is a measure of bank's soundness to withstand the risks arising from its operations. Aroghene and Ikeora (2022) opined that regulatory body for the sector developed CAR as a metric to assess the stability of the banking system and make sure that banks can absorb a reasonable amount of operational losses. Capital is a measure of the resources banks have to absorb losses. For this study CAD will be proxy by capital adequacy ratio measured as the sum of tier 1 and tier 2 capital divided by risk weighted asset of the banks under consideration.

#### 2.1.3 Bank Size (BSI)

For this study BSI refers to the level of asset the banks under consideration possess as there is need to determine if it is responsible for why FUGAZ stood out among other banks. It is measured as the logarithm of the total assets of the banks under consideration.

#### 2.1.4 Liquidity (LIQ)

LIQ is a measure of the cash and other assets banks have available to quickly pay bills and meet short term business and financial obligations. In this study it will be evaluated by dividing current assets to current liability.

#### 2.1.5 Bank Stability (BST)

Aroghene and Ikeora (2022) stated that Banking stability is the absence of an unexpected disturbance in the delivery of credit, payment systems, and banking services.. For the purpose of this study BST will be define as the outshining power of the commercial banks under consideration. It is represent by Z- Score measured as the total of return of asset and equity/asset ratio to standard deviation of return on asset

#### 2.1.6 FUGAZ Bank

FUGAZ is an acronym that represent Nigeria tier 1 banks base on their market capitalisation, total assets, goss earnings and profit after tax. These bank are First Bank of Nigeria Holdings, United Bank of Africa, Guarantee Trust Holding Company and Zenith Bank. Over 60% of the earnings reported in the sector are attributable to FUGAZ banks. Zenith reported N50.5 billion in Q1 2020 profit after tax, GTB N50.1 billion, Access N40.9 billion, UBA N30.1 billion, and FBN Holdings N25.7 billion.

#### 2.1.6 Theoretical Framework

Below are the theories pertinent to this study of which the study hinge on theory of Portfolio Regulation. These theories consist of the theory of portfolio regulation, charter value theory and the expense theory.

#### 2.1.7 Theory of Portfolio Regulation (TPR)

The theory assumes that unregulated banks are prone to taking excessive portfolio and leverage risks for them to maximize shareholders value at the detriment of the deposit insurer. Therefore there arise the need for banks to be properly regulated to uphold safety, stability and soundness of the banking system such that they can meet their liabilities as at when due with ease. Furlong & Keeley (1989) opined that capital regulations will compel banks to hold lower levels of risk assets. TPR offers a yardstick for assessing the stability of the banking system.

#### 2.1.7 Charter Value Theory (CVT)

In order to protect themselves from financial crises and control default risk, banks routinely retain extra capital in support of the required capital levels, according to CVT. In 1984, Marcus proposed the theory.

#### 2.1.8 Expense Theory (ET)

Williamson introduced ET in 1963. It was known as the theory of management discretion in 2001, according to Nyong. ET claims that managers tend to pursue strategies that will best serve their own interests or maximize their utility rather than maximizing shareholder profit. This might equate to excessive risk-taking and trading, which would undermine the bank's capital foundation.

**2.1.9 Empirical Review**

The following works was reviewed for the study purpose: Alemu (2015) discovered a favorable correlation between capital adequacy and bank performance when examining Ethiopia’s banking performance from 2000 to 2013. In 2021, Bencharles and Nwankwo through the use of REM and fixed effect model FEM techniques found out that credit risk management variables (LQR, CAR, LLPR) were found to strengthen banks stability although their significance were mixed. Bank size was establish to be negatively related with banks stability. The effect of capital regulation on the stability of deposit money banks in Nigeria from 2004 to 2018 was studied by Yusuf and Umar (2021). Using descriptive statistics and panel regression techniques to analyse the data, the study came to the conclusion that capital regulation had a considerable impact on bank stability. Olalekan et al. (2018) also examined the size of the board, risk management, and the performance of listed deposit money institutions. They discovered that the liquidity risk little affected the ROE and EPS of Nigerian banks. Nguyen (2021), who employed the Generalized Method of Moments (GMM) model in the data analysis, found a favorable correlation between the capital adequacy ratio and the financial stability of Vietnamese commercial banks during the course of the study period. Comparable to Fanta, Kemal, and Waka (2013), who first began observing Ethiopian Banks in 2005.

**3. RESEARCH METHODOLOGY**

**3.1 Population and Sample**

The population of study comprises all commercial banks that has both international, national and regional authorisation to operate in Nigeria namely Unity Bank plc, United Bank of Africa, Zenith Bank, Stanbic IBTC Holdings, Access Bank, Guarantee Trust Bank, Titan Trust Bank limited, Ecobank, Skye Bank, Fidelity Bank, Providus Bank, Globus Bank, Sun Trust Bank, Paralex Bank Limited, Citi Bank Limited, Sterling Bank, Standard Chartered Bank, Keystone Bank, First City Monument Bank, Heritage Bank, First Bank of Nigeria, Union Bank and Wema Bank. Although, the sample consist of only five banks which are rank highest in terms of market capitalisation, total assets, gross earnings and profit after tax namely: First Bank of Nigeria Holdings, United Bank of Africa, Guarantee Trust Holding Company and Zenith Bank. Banks that do not fit into this criteria was not included.

**3.2 Source of Data and Sample**

The data for this study were obtained from annual reports of the FUGAZ banks from the period of 2013 to 2021 (9years).The data for the period was chosen based on their performance within the years reviewed.

**3.3 Method of Data Analysis**

The study used ex post facto design while it implore descriptive statistics, multi collinearity test, correlation matrix and multiple regression analysis to analyse the effect of CAR, BSI and LIQ on FUGAZ bank stability proxy by (Z-score) in Nigeria. While CAR, BSI and LIQ are the independent variables bank stability proxy by (Z-score) is the dependent variable.

**3.4 Model Specification**

The model examined in this study is stated in its functional form as:

$$BST = f(CAR, BSI, LIQ) \dots\dots\dots(1)$$

This model is reformed from the work of Sunday and Felicia (2020) and was modified to meet our research objectives. The model is further specified in its econometric form as:

$$BST = \alpha_0 + \alpha_1 CAR + \alpha_2 BSI + \alpha_3 LIQ + u \dots\dots\dots (2)$$

Where:

BST= Bank Stability

CAR= Capital Adequacy Ratio

LIQ= Bank Liquidity

$\alpha_0$  =Intercept

U= Error term

$\alpha_1, \alpha_2$  and  $\alpha_3$  are parameters to be estimated

Apriori expectations of the explanatory variables in relation to the dependent variable are  $\alpha_1, \alpha_2$  and  $\alpha_3 >0$ .

**4. RESULTS AND DISCUSSION**

A Descriptive Statistics of CAR, BSI and LIQ on Z-score of FUGAZ banks in Nigeria

**Table 1: Summary of descriptive statistics**

|           | ZSCORE   | CAR      | BSI      | LIQ      |
|-----------|----------|----------|----------|----------|
| Mean      | 1.415748 | 0.330703 | 7.600617 | 1.308712 |
| Median    | 1.415685 | 0.198348 | 6.716657 | 0.876764 |
| Maximum   | 1.418326 | 4.935155 | 9.985011 | 11.98307 |
| Minimum   | 1.415000 | 0.143426 | 5.430754 | 0.002175 |
| Std. Dev. | 0.000585 | 0.707437 | 1.627202 | 2.475347 |

|              |          |          |          |          |
|--------------|----------|----------|----------|----------|
| Skewness     | 2.142725 | 6.330620 | 0.248921 | 3.579581 |
| Kurtosis     | 9.764916 | 41.71444 | 1.366376 | 14.99546 |
| Jarque-Bera  | 120.2422 | 3110.841 | 5.468580 | 357.7654 |
| Probability  | 0.000000 | 0.000000 | 0.064940 | 0.000000 |
| Observations | 45       | 45       | 45       | 45       |

Source: Econometric views version 9.0, 2022.

In table I, BST proxy by Z-score shows a mean and Std. Dev values of 1.4157 and 0.0006 which indicates disparity in the selected banks' stability as seen by their max. and min. values of 1.4183 and 1.4150. From the table BST is positively skewed (2.14) with a leptokurtic value of (9.76) which shows the certainty of disparities within the period studied.

Also, in table I, CAR shows a mean and Std. Dev values of 0.3307 and 0.7074 which indicates discrepancy in the selected banks CAR as seen by their max. and min. values of 4.9351 and 0.1434. From the table CAR has positive skewness of 6.33 with a leptokurtic value of 41.71 which reflect variance within the period undertaken.

Likewise, in table I, BSI shows a mean and Std. Dev values of 7.6006 and 1.6272 which indicates divergence in the selected banks BSI as seen by their max. and min. values of 9.9850 and 5.4307. From the table BSI has positive skewness of 3.58 with a platykurtic value of 1.37 which reflect variance within the period embarked on.

Similarly, table I, LIQ shows a mean and Std. Dev values of 1.3067 and 2.4753 which indicates departure in the selected banks LIQ as seen by their max. and min. values of 11.9830 and 0.0022. From the table LIQ has positive skewness of 0.25 with a leptokurtic value of 14.995 which reflect variance within the period embarked on.

In the same way, the Jarque-Bera Probability of the variables showed that Z-score, CAR, and LIQ are not normally distributed since their probability value is less than 0.05 which can be attributed to difference in the data of the various banks. From the table BSI show normal distribution with a probability value of 0.0649.

**Table 2 Variance Inflation Factors**

Date: 10/17/22 Time: 01:08

Sample: 1 45

Included observations: 44

| Variable | Coefficient Variance | Uncentered VIF | Centered VIF |
|----------|----------------------|----------------|--------------|
| C        | 2.11E-07             | 26.26829       | NA           |
| CAR      | 1.68E-08             | 1.279271       | 1.048471     |
| BSI      | 3.33E-09             | 24.63442       | 1.042161     |
| LIQ      | 1.35E-09             | 1.295721       | 1.007542     |

Source: Econometric views version 9.0, 2022.

From the values shown in table 2, the centered VIF for all the independent variables are greater than 0.1 but less than 5. In view of the foregoing the study found that there is absence of multicollinearity among the variables.

**Table 3: Heteroskedasticity Test: Breusch-Pagan-Godfrey**

|                     |          |                     |        |
|---------------------|----------|---------------------|--------|
| F-statistic         | 0.784210 | Prob. F(3,40)       | 0.5098 |
| Obs*R-squared       | 2.444139 | Prob. Chi-Square(3) | 0.4855 |
| Scaled explained SS | 7.531250 | Prob. Chi-Square(3) | 0.0568 |

Source: Econometric views version 9.0, 2022.

In table 3, the Prob Chi Square (3) is 0.4855 which is greater than 5% at such the results indicates that the variable (data) under review are homoscedastic and would not lead to spurious result when analysed.

**Table 4: summary of correlation**

|        | ZSCORE  | CAR     | BSI    | LIQ |
|--------|---------|---------|--------|-----|
| ZSCORE | 1.0000  |         |        |     |
| CAR    | 0.0576  | 1.0000  |        |     |
| BSI    | -0.1875 | -0.1983 | 1.0000 |     |

|     |         |         |         |        |
|-----|---------|---------|---------|--------|
| LIQ | -0.0699 | -0.0795 | -0.0176 | 1.0000 |
|-----|---------|---------|---------|--------|

Source: Econometric views version 9.0, 2022.

In table 4, CAR with coefficient of 0,0577 is positively related to bank stability (BST) proxy by z-score whereas BSI and LIQ with coefficients of -0.1875 and -0.0699 are negatively related to BST. The correlation coefficients reveal that the variables are not highly related.

#### Table 5: Regression Result

Dependent Variable: ZSCORE

Method: Least Squares

Date: 10/17/22 Time: 01:03

Sample: 1 45

Included observations: 44

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| C                  | 1.416290    | 0.000460              | 3081.977    | 0.0000    |
| CAR                | 0.000012    | 0.000130              | 0.092308    | 0.9246    |
| BSI                | -0.000068   | 0.000058              | -1.172414   | 0.2468    |
| LIQ                | -0.000017   | 0.000037              | -0.459459   | 0.6457    |
| R-squared          | 0.040747    | Mean dependent var    |             | 1.415760  |
| Adjusted R-squared | 0.031197    | S.D. dependent var    |             | 0.000586  |
| S.E. of regression | 0.000595    | Akaike info criterion |             | -11.93036 |
| Sum squared resid  | 1.41E-05    | Schwarz criterion     |             | -11.76816 |
| Log likelihood     | 266.4679    | Hannan-Quinn criter.  |             | -11.87021 |
| F-statistic        | 0.566376    | Durbin-Watson stat    |             | 1.093581  |
| Prob(F-statistic)  | 0.640375    |                       |             |           |

Source: Econometric views version 9.0, 2022.

In Table 5, the coefficient of CAR is 0.000012 with a t-value of 0.092308 and an associated p-value (Sig. value) of 0.9246. From the result CAR has a positive and an insignificant effect on Z-Score of FUGAZ bank in Nigeria at (5%) significant level. the result show that one naira increase in the capital in relation to their risk weighted asset of the FUGAZ banks will result to 0.0012 increase in the Stability of FUGAZ bank. This is in line with the findings of Nguyen (2021) and Daoud and Kammoun (2020) but contradicts the findings of Amahulu et al. (2017).

Also, in table 5, the coefficient of BSI is -0.000068 with a t-value of -1.1724 and an associated p-value (Sig. value) of 0.2468. From the result BSI has a negative and an insignificant effect on Z-Score of FUGAZ bank in Nigeria at (5%) significant level. The result show that one naira increase/decrease in FUGAZ bank size will result to 0.000068 decrease/increase in the Stability of FUGAZ bank in Nigeria. This agree with Bencharles and Nwankwo (2021) report but divergent to the findings of Rashid, Syed and Syed (2014). Likewise, in table 5, the coefficient of LIQ is -0.000017 with a t-value of -0.4595 and an associated p-value (Sig. value) of 0.6457. From the result LIQ has a negative and an insignificant effect on Z-Score of FUGAZ bank in Nigeria at (5%) significant level. The outcome indicate that one naira increase/decrease in FUGAZ liquidity will led to 0.000017 decrease/increase in the Stability of FUGAZ bank in Nigeria. This result is in line with the work of Sunday and Felicia (2020) but dissimilar to the findings of Odunayo and Joseph (2016).

Lastly, in the regression result the r-square is 0.0407 while the adjusted r-square is 0.0312 which therefore implies that 4.07% of the independent variables CAR, BSI and LIQ explained the dependent variable Z-score while the remainder is as a result of the error term (u). The Durbin-Watson stat. is 1.0936 which is less than 2, which shows that the regression model is fit.

#### 5. CONCLUSION AND RECOMMENDATIONS

The findings disclosed that CAR has positive and insignificant effect on Z-Score of FUGAZ bank in Nigeria. Whereas BSI and LIQ has negative and insignificant effect on Z-Score of FUGAZ bank in Nigeria. The study therefore concludes that capital adequacy has an affirmative influence while BSI and LIQ has negative effect on the stability of FUGAZ bank in Nigeria.

Base on the findings, this study acclaims that Bank administrators should ensure that they keep up capital that is sufficient to enable them absorb shock so as to be outstanding. Likewise banks should ensure their asset size is large enough to absorb their liabilities.

#### REFERENCES

- Alemu, D. (2015). Assessment of banking performance using capital adequacy in Ethiopia. *Economics*, 4(6), 106-111.

- Amahalu, N. N., Emmanuel, I. , Nweze, C. L. , Obi, J. C. , & Okika, E. C. (2017). Effect of capital adequacy on financial performance of quoted deposit money banks in Nigeria. *International Conference on African Entrepreneurship and Innovation for Sustainable Development (AEISD)*.
- Aroghene, K. G. & Ikeora, J. J.E. (2022). The effect of non performing loans, capital adequacy and corporate governance on bank stability in Nigeria. *Finance and Accounting Research Journal*, 4(4).
- Batani, L., Vakilifard, H. & Asghari, F. (2014). The influential factors on capital adequacy ratio in Iranian banks. *International Journal of Economics and Finance*, 6(11), 108-11
- Bencharles, K. O. & Nwankwo, C. D. (2021). Credit risk management and deposit money banks stability in Nigeria: Does good corporate governance matter? *Research Journal of Finance and Accounting*, 12(16), 1-14.
- Ezike, J.E. (2013). Capital adequacy standards, Basel Accord and bank performance: The Nigerian experience (A case study of selected banks in Nigeria). *Asian Economic and Financial Review*, 3 (2) , 146–159.
- Fanta ,A. B., Kemal, K. S., & Waka, Y. K. (2013). Corporate governance and impact on bank performance. *Journal of Finance and Accounting* 1(1), 19-26.
- Furlong, F. T. , & Keeley, M. G. , (1989). Capital regulation and bank risk taking: A Note. *Journal of Banking and Finance* 13, 883–891.
- Marcus, A. (1984). Deregulation and bank financial policy. *Journal of Banking and Finance*, 8, 557–565.
- Nguyen, M. S. (2021). Capital adequacy ratio and a bank’s financial stability in Vietnam. *Banks and Bank Systems*, 16(4), 61-71.
- Nyong, O. M. (2001). Monetary policy and commercial banks in Nigeria: Some theoretical and empirical extensions. *CBN Economic and Financial Review*. 34(3), 777-795.
- Nzotta, S. M. (2004). *Money, Banking and Finance (Theory and Practice)*. Jude Nigeria Publishers.
- Oduor, J., Ngoka, K. & Odongo, M. (2017).Capital requirement, bank competition and stability in Africa. *Review of Development Finance*, 7, 45-51.
- Ongore, V.O. & Kusa, G.B. (2013). Determinants of financial performance of commercial banks in Kenya. *International Journal of Economics and Financial Issues*. 3(1), 237-252.
- Rashid, L., Syed, H. R., & Syed, A. H. G. (2014). The impact of corporate governance on performance of privatized firms: Evidence from non-financial sector of Pakistan. *Journal of Scientific Research*, 19 (3), 360-366.
- Sunday, O. I. & Felicia, A. N. (2020). Capital adequacy and bank stability/soundness in Sub-Saharan Africa. *European Journal of Accounting, Finance and Investment*, 6(5).
- Yusuf, M. B. & Umar, A. I. (2021). Effect of bank capital regulation on stability of selected deposit money banks in Nigeria: A panel data approach. *IOSR Journal of Economics and Finance (IOSR-JEF)*, 12(2), 27-34.

