



IMPACT OF LIQUIDITY RISK AND CREDIT RISK ON BANK STABILITY IN NIGERIA

BY

Aroghene Kparobo Gloria

Department of Banking and Finance
Faculty of Management Sciences
Delta State University, Abraka

Ehiedu Victor C. Ph.D

Department of Banking and Finance
Faculty of Management Sciences
Delta State University, Abraka
ehieduvc@delsu.edu.ng

Onuorah A.C. Ph.D

Department of Banking and Finance
Faculty of Management Sciences
Delta State University, Abraka

Abstract

In other to determine networking capital and percentage of assets on books dedicated to loans that is optimal for the stability of banks, the study investigated liquidity risk and credit risk on bank stability with respite to Nigeria banks. The study objectives are to determine the effect of liquidity risk and credit risk on bank stability in Nigeria. The ex-post facto research design was employed using secondary data gathered from the annual financial statement of ten banks operating in Nigeria between 2010 and 2022. Results from the analysis showed that LR has a positive and reasonable influence on BAST while CR has a trivial influence on bank stability in Nigeria. The study recommend that the net working capital of banks should be kept optimum so as to be able to meet its short term obligations. In same vein, percentage of assets on the books dedicated to loans should be monitored and also keep within the safe margin so as to prevent exposure to higher defaults. The study contributed to knowledge by modifying the usage of LR and CR in this present work

Key Words: Liquidity, Credit, Risk, Stability

Introduction

A number of criteria, including return on investment, dividend growth, sales turnover, and profitability, may be used to assess a company's financial success. Regarding how to assess an organization's success and the factors that affect financial performance, there is still debate across a number of professions (Liargovas et al., 2008). Liquidity is closely related to working capital (WC), which is the money needed to support the company's daily revenue-generating operations. Business performance depends on financial managers' ability to effectively manage the elements of WC (Filbeck & et al., 2005). A company is considered to be liquid if it maintains an adequate amount of liquid assets and cash on hand, as well as the capability of swiftly obtaining more funding to satisfy its commitments. These include: the current ratio, which is the simplest measure and is measured by apportioning total current assets by total current liabilities; and the quick ratio, calculated by deducting inventories from current assets and then dividing by current liabilities. Although the two ratios are comparable, the rapid ratio offers a more precise evaluation of a company's capacity to meet its immediate obligations. The higher quick ratio is the better the position of the business (Begg, Fisher & Rudiger, 2011). According to Sabri Mohammad (2015), there are two different forms of bank liquidity in the financial system: financing (or obligation) liquidity risk and market (or asset) liquidity risk. Funding-liquidity risk refers to the risk that the bank is unable to effectively meet its obligations as they become due, as opposed to market-liquidity risk, which is related to the banks' inability to easily counterbalance or sell assets at the market price due to insufficient market strength or market distraction (Basel Committee, 2008).

Statement of the Problem

Lack of firmness in banking operations maybe tantamount to its failure. Bank collapse may come from a lack of liquidity, which is detrimental to the institution's image and depositor confidence. Banks grant credit as part of their intermediary role . But this role also form part of risk they bear if these facilities granted becomes non-performing. Liquidity management plays a significant role in determining success or failure of firm indue to its effect on firm's financial profitability.The risk in credit facility rendered by banks affects their financial performance which have consequent on their stability. Profitability is how well an organisation uses it assets to generate revenue. While Stability is unexpected disturbance in the discharge of banks intermediation activities. In order to determine the stability of banks certain profitability ratio such as ROA, Standard deviation of ROA and certain balance sheet items (Total asset & total equity) are required.

A number of studies on liquidity and credit risks and their impact on banking stability showed inconsistency across countries. Some studies recorded a negative effect (Imbierowcz& Rauch, 2014; Mensi&Labidi, 2015; Hakimi&Zaghdoudi, 2017; Matey, 2021),while others were positive (Ghenimi , Chaibi&Omri, 2017; Setiawan, Sudarto&Widiastuti, 2021; Siyanbola& Adebayo 2021). Of the aforementioned literatures not all were research in Nigeria (Hakimi&Zaghdoudi, 2017; Matey, 2021) amongst others. This research sought to fill the void in literature and expand frontier of knowledge as it pertains to the effect of liquidity riskand credit risk on bank stability in Nigeria.

REVIEW OF RELATED LITERATURE

Liquidity Risk

It refers to how easily non-monetary assets of a bank can be exchanged for money to satisfy its impending commitments with little to no loss. Liquidity and profitability are the two main measures of a corporation's financial success, according to Ehiedu (2014). Liquidity ratio is used to judge the ability of a firm to meet its short term maturing obligations. The absence of liquidity is illiquidity, and if it persists over time, it may lead to the bankruptcy and eventual liquidation of the bank. Central bank of Nigeria CBN 2013 stated that Liquidity risk arises from an institution's inability to purchase or otherwise obtain the necessary funds, either by increasing liabilities or converting assets, to meet on- and off-balance sheet obligations as they come without incurring unacceptable losses. For this study liquidity would be applied as the potential of a bank to repay its current liabilities with its present assets. In this study liquidity risk would be measured as net working capital ratio calculated as current assets- current liabilities. Ratio of 1.5 to 2.0 is seen as optimal

Credit Risk

The prominence of lending arises from the fact that for most banks, loans form the most significant proportion of their risk asset portfolio. Undoubtedly, a sizable amount of banks' profits come from loan interest. Banks must thus establish a suitable framework to handle the credit risks that are present in their portfolio of risky assets. For this study credit risk would be observed as a determinant of asset composition of a bank showing the percentage of assets on the books dedicated to loans. It would be applied as banks exposure to defaults. Loans to total assets ratio was used to determine the share of bank loans in total assets. Whenthis ratio is high, it means that the bank is less liquid and more exposed to higher defaults

Bank Stability

Banking stability refers to the absence of abnormal disruption in credit supply, payment systems, and banking services (Ozili, 2018). According to Bencharles and Nwankwo(2021)profitability focuses on the return on investment per time without taking cognizance of the inherent risks in thefirm's operations. According to Ayinuola and Gumel (2023), any bank undertaking hazardous investments in the hope of high profits without paying enough attention to risk management may be inviting long-term banking trouble.Therefore, the long-term viability of any bank will depend on its capacity to establish an effective framework to handle all the intrinsic risks in its business.

In the view of Setiawan et al. (2021)and Amara and Mabrouki (2019) bank stability is measured with z- score.For this study bank stability would be represented byZ-score computed as $(u + k) / \hat{\sigma}$ deflated by $\hat{\sigma}$.Where u represents a bank asset assessed in terms of Return on Assets (ROA). K is the capital ratio, that is expressed as equity as a percentage of total asset value. whereas $\hat{\sigma}$ denotes return volatility, which is quantified as standard deviation of ROA. A rise in the Zscore indicates improved bank stability, and consequently a lower probability of bankruptcy.

Theoretical Framework

Commercial Loan Theory:

Adam Smith proposed it first in 1976. According to Chinweoda ,Onuora , Ikechukwu, Ikechukwu&Ngozika (2020)to the principle, a commercial bank should concentrate on offering short-term business loans to assist businesses during a business cycle. Banks are in a good position to satisfy their liquidity demands since they can finance short-term, self-liquidating transactions that will mature quickly. In summary, according to Acharya and Pedersen (2005), banks should only make loans whose sources of repayment are money created by the transactions they are used to finance. As a result, bank may benefit from these loans' liquidity and minimal credit risk.

Shift Ability Theory:

The idea, which was developed by Harold G. Moulton in 1915, asserts that bank can fulfil its liquidity demands provided it owns sufficient assets that are quickly convertible to pay maturing financial commitments. These assets can be immediately sold for cash to other or investors without having to wait until maturity and with no major loss in asset value. In other words, instead of relying on maturing loans to address their liquidity concerns, these assets may be sold to other financial institutions for cash. This idea is applicable to short-term financial products such as Treasury Bills and Certificates.

Empirical Review

Imbierowcz and Rauch (2014) looked at the connexionamid liquidity and credit risks and how it affected the possibility of bank defaulting in the US. The findings revealed no mutual time-lag link between the both risk categories that was economically significant. Nevertheless, they affect the chance of default for banks because each risk raises the possibility of a failure individually. The liquidity ratio has an influence on profitability, according to Diaconu and Oanea's 2015 examination of the factors affecting bank stability (BAST). Additionally, they pointed out that increased stability is not always a result of increased profitability. When Ali and Stanley (2016) evaluated liquidity management on financial performance he used account receivable, account payable and cash management as proxy for liquidity while growth, efficiency and profitability was proxy for financial performance .The relationship between CR and LR and their effects on the financial performance of Pakistani banking institutions were explored by Ahmad et al. in 2019. They found that problems with credit and liquidity deleterious impact on bank performance and raised the risk of insolvency. The results showed an inverse relationship between bank performance and CR, which suggests that BAST declines as credit risk rises. Furthermore, the study found thestimulus of LR on bank stability to be negative and significant, indicating that banks with adequate liquidity are more stable than those with inadequate liquidity.

In addition, Amara and Mabrouki (2019) could not discover any arithmetically significant contemporaneous, mutual, or time-lag relationships between credit and liquidity concerns. However, each risk affects BAST on its own, and their interaction makes banks more unstable. Additionally, albeit negligible, the liquidity ratio's short-term impact on BAST was favourable. LR and CR were highlighted as the two primary concerns impacting BAST by Setiawan et al. in 2021. The findings demonstrated that whereas LR had a favourable influence on default likelihood, CR had a negative one. Matey (2021) discovered a statistically significant negative correlation between LR and BAST, highlighting the need of making investments in interest-earning securities to boost bank profitability and strengthen BAST. CR, on the other hand, showed a negligible correlation to BAST. The impact of capital adequacy, bank size, and liquidity on the stability of FUGAZ banks in Nigeria from 2013 to 2021 (9 years) was carefully examined by Aroghene (2022). According to the analysis, CAR has a positive but negligible impact; BSI and LIQ have a negative but negligible impact, on Z-Score of FUGAZ banks in Nigeria. Aroghene (2022) examined additional variables that affect BAST, such as board independence and audit committee independence; he discovered that these variables had a negligible impact on BAST in Nigeria. Once more, When assessing BAST drivers, Aroghene and Ikeora (2022) looked at corporate governance, capital adequacy, and non-performing loans (NPLs) as explanatory variables. At 5% significance, the study revealed that external control had a negative and substantial influence on the Z-Score of Nigerian listed deposit money institutions, whereas NPLR, CAR, and internal control had a positive but moderate impact. Sang Tang My (2022) evaluated the bearing of CR on Vietnamese commercial banks' financial stability. The findings demonstrated that CR has a favourable influence on bank financial stability. According to Aroghene (2023), who examined the factors in fraud that have an impact on BAST, improper financial reporting, bad bookkeeping techniques, fraudulent loans, and money laundering have a detrimental and statistically significant impact on the stability of financial institutions in Nigeria. When Onuorah, Ehiedu and Egugbo (2023) studied Camels rating and its effects on fugaz banks' performance in Nigeria. They observed that ROA is positively influenced by liquidity and asset management, or LIAM.

Research Methodology

The study made-used of ex post facto research design using the panel data econometrics analysis. The study data were obtained from the annual report and publications of the banks reviewed and the statistical bulletin of the Central Bank of Nigeria for 2021. The data span of 2010 - 2022 and a cross section of ten banks. The data for the study would be analysed using descriptive statistics, correlation analysis, unit root test while ordinary least squares would suffice to test the hypothesis that is in the null form that liquidity risk and credit risk has no impact on bank stability in Nigeria through the aid of reviews statistical tool.

Model Specification

To achieve the prime objective of this investigation, we used the panel regression model from Ayinuola and Gumel (2023) study. This model was modified for this study. The study model is therefore stated as:

$$BAST = f(LR, CR) \dots\dots\dots eqn(1)$$

$$BAST = a_0 + a_1LR + a_2CR \dots\dots\dots eqn(2)$$

$$BAST = a_0 + a_1LR + a_2CR + u \dots\dots\dots eqn(3)$$

Where:

BAST is bank stability measured by $(u + k)/\hat{\sigma}$

Where u is return on asset (ROA), k equals equity to total assets, $\hat{\sigma}$ equals standard deviation of ROA.

a_0 is the intercept

a_1 - a_2 is the coefficient

LR is liquidity risk measured by net working capital ratio calculated as current assets- current liabilities.

CR is credit risk measured by the ratio of Loans to total assets

u is the error term.

Results and Discussions

Table 1: Summary of Descriptive Statistics

Variables	Observations	Mean	Median	Maximum	Minimum	Std.Dev
BAST	130	0.009332	0.001403	0.475488	-0.000130	0.052750
LR	130	1.769008	3.878070	2.76010	-7.000009	3.58009
CR	130	7.403268	0.421845	4.197915	0.028982	51.77826

Source: Eviews Extract (2023)

In table 1 BAST has an average value of 0.93% alongside extreme value of 0.48% and least value of -0.13%. The regular value for BAST over the period showed that they under performed as higher value indicates greater bank stability. Also, the consistent value for LR is 1.77% together with extreme and low value of 2.76% and -7%. The average of the LR shows a better liquidity position of the banks. As net working capital ratio between 1.5 to 2.0 is considered optimal. In the same vain, CR displayed an average value of 7.40% in conjunction with 4.19% as the maximum value and 2.89% as the least value. The loan to asset ratio value considered to be optimal lies between 30% and 36%. But the loans to total assets value for the period study are above 30% which is an indication of exposure to high default.

Table 2: Correlation Analysis

	BAST	LR	CR
BAST	1.000000		
LR	0.008808	1.000000	
CR	-0.020202	0.10005	1.000000

Source: Eviews Extract (2023)

In table 2, LR has a positive slope with BAST with coefficient value of 0.008808 while CR has a negative slope with BAST with coefficient value of 0.020202 while LR and CR has a positive relation to one another. Due to the low degree of the correlation values it suffices to say the correlations between the variables of study are not perfect.

Table 3: Multi collinearity Test

Variables	VIF Values	Tolerance Levels
LR	1.002420	0.997585
CR	1.020747	0.979674

Source: Eviews Extract (2023).

In Table 3, the VIF values of each of the explanatory variable is way lower than 10 with tolerance levels that are beyond 0.1. By implication the study model is free from the problem called multi-collinearity.

Unit Root Test

Table 4: Augmented Dicker Fuller Test for LR

Null Hypothesis: LR has a unit root

Exogenous: Constant

Lag Length: 5 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.251077	0.0195
Test critical values: 1% level	-3.487046	
5% level	-2.886290	
10% level	-2.580046	

*MacKinnon (1996) one-sided p-values.

Source: Eviews Extract (2023).

Table 5: Augmented Dicker Fuller Test for CR

Null Hypothesis: CR has a unit root

Exogenous: Constant

Lag Length: 4 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.970470	0.0405
Test critical values: 1% level	-3.483312	
5% level	-2.884665	
10% level	-2.579180	

*MacKinnon (1996) one-sided p-values.

Source: Eviews Extract (2023).

Table 6: Augmented Dicker Fuller Test for BAST

Null Hypothesis: BAST has a unit root

Exogenous: Constant

Lag Length: 2 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.210733	0.0000
Test critical values: 1% level	-3.482453	
5% level	-2.884291	
10% level	-2.578981	

*MacKinnon (1996) one-sided p-values.

Source: Eviews Extract (2023).

The test of stationary of the variables was ascertained by the used of ADF test in table 4, 5 and table 6. The ADF test result showed that LR, CR and BAST are stationary at 5% level of significant integrated at the same order. Hence the assumption of non stationarity of LR, CR and BAST is rejected. Consequent on the ADF test result, the model would not produce misleading estimate.

Table 7: Model Estimation

Dependent Variable: BAST

Method: Least Squares

Date: 05/26/23 Time: 16:45

Sample: 1 130
 Included observations: 129

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.009574	0.004752	2.014706	0.0461
LR	0.300413	0.120012	-2.503191	0.0152
CR	-2.068205	9.070005	-0.226814	0.8209
R-squared	0.500486	Durbin-Watson stat		1.555934
Adjusted R-squared	0.451380			
F-statistic	6.030612			
Prob(F-statistic)	0.049859			

Source: Eviews Extract (2023).

In table 7 the model was estimated by ordinary least square. LR has a coefficient value of 0.3% with a Prob. of 0.0152. By implication of these value a percentage increase/decrease in LR would result in 0.3% increase/decrease in BAST all things be equal. This findings is in agreement with the works of (Diaconu and Oanea, 2015; Onuorah, Ehiedu and Egugbo, 2023), but contrary to (Aroghene, 2022).

Likewise, the coefficient value of -2.07% and Prob. value of 0.8209 revealed that a percentage increase/decrease in CR would lead to 2.07% decrease /increase in BAST ceteris paribus. This findings agreed with the opinion of Ahmad et al. (2019; Matey 2021) contrary to the opinion of Sang Tang My (2022)

The R-squared of 50% indicated that 50% of the explanatory variables

Reference

Acharya, V. V. & Pedersen, L.H. (2005) Asset pricing with liquidity risk. *Journal of Financial Economics*, 77(2), 375-410.

Ahmad, I., Salam, S., Ahmad, A., & Abbas, S. (2019). The nexus between credit risk and liquidity risk and their impact on banks financial performance: Evidence from Pakistan. *Sarhad Journal of Management Sciences*, 5(1), 67-86.

Ali, A. S. & Stanley, K. (2016). Effect of liquidity management on financial performance of commercial banks in Mogadishu, Somalia. *International Journal for Research in Business, Management and Accounting*, 2(5).

Amara T, Mabrouki M. (2019) The impact of liquidity and credit risks on the bank stability. *Journal of Smart Economic Growth*, 4(2), 97-116.

sufficiently explained BAST while the residual is as a result of other factors (macro & micro economical) as well as operational risk influence on BAST. The Durbin-Watson Stat. indicated positive autocorrelation among the studied variables.

Conclusion And Recommendation

Given the overall analysis, it suffice to conclude that BAST is highly influenced by LR while the influence CR has on BAST is minimal. The study recommend that the net working capital of banks should be kept optimum so as to be able to meet its short term obligations. In same vein, percentage of assets on the books dedicated to loans should be monitored and also keep within the safe margin so as to prevent exposure to higher defaults.

Aroghene, K. G. (2022). Effect of Capital Adequacy, Bank Size and Liquidity on the stability of FUGAZ Bank in Nigeria. *International Journal of Academic Management Science Research (IJAMSR)*, 6(12), 1-7.

Aroghene, K. G. (2022). Effect of Board Independence and Audit Independence on Bank Stability in Nigeria. *International Journal of Academic Accounting, Finance & Management Research (IJAAFMR)*, 6(11), 67-71.

Aroghene, K. G. (2023). Fraud and its Effect on the Stability of Financial Institutions in Nigeria. *International Journal of Academic Multidisciplinary Research (IJAMR)*, 7(2), 150-155.

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), 180-192.
- Ayinuola, T.F. & Gumel, I.G. (2023). The Nexus between Liquidity and Credit Risks and Their Impact on Bank Stability. *Asian Journal of Economics Business and Accounting*, 23(11), 15-27
- Basel Committee on Banking Supervision (2008). Principles for Sound Liquidity Risk Management and supervision, Bank for International Settlements, September.
- Begg, Fisher and Rudiger (2011), Monetary Economics, U.S.A: Macmillan Publishers
- 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.
- Birt, J., Chalmers, K., Brooks, A., Byrne, S., & Oliver, J. (2011). *Accounting: Business reporting for decision making* (3rd ed.). Milton, Australia: John Wiley & Sons.
- Central Bank of Nigeria (2013). Understanding Monetary Policy Series No 34: Banking System Liquidity, Monetary Policy Department 10th Anniversary Commemorative Edition.
- Chinweoda UO, Onuora UR, Ikechukwu, E. M., Ikechukwu, A.C., & Ngozika, O. A. (2020). Effect of liquidity management on the performance of deposit money banks in Nigeria. *Journal of Social Sciences Research*, 6(3), 300-308.
- Diaconu, I. R., Oanea, D. C. (2015). Determinants of bank's stability. Evidence from credit coop. *Procedia Economics and Finance*, 32, 488-495.
- Ehiedu, V.C. (2014). The impact of liquidity on profitability of some selected companies: The financial statement analysis (FSA) approach. *Research Journal of Finance and Accounting*, 5(5), 81-90.
- Filbeck, G. & Krueger, T.M. (2005). An Analysis of Working Capital Management Results across industries *Mid-American Journal of Business*, 20 (2), 10-17.
- Ghenimi A, Chaibi H, Omri MAB. (2017). The effects of liquidity risk and credit risk on bank stability: Evidence from the MENA region. *Borsa Istanbul Review*, 17(4), 238-248.
- Hakimi, A. & Zaghdoudi, K. (2017). Liquidity risk and bank performance: An empirical test for Tunisian banks. *Business and Economic Research*, 7(1), 46-57.
- Ibrahim, T.M. & Agbaje, O. M. (2013). The relationship between stock return and inflation in Nigeria. *European Scientific Journal*, 9(4).
- Imbierowicz B, Rauch C. (2014). The relationship between liquidity risk and credit risk in banks. *Journal of Banking & Finance*. 40:242-256.
- Kaaya I, Pastory D. (2013). Credit risk and commercial banks performance in Tanzania: A panel data analysis.
- Liargovas, P., & Skandalis, K. (2008), Factor affecting firm's financial performance: The case of Greece. Athens: University of Peloponnese Press.
- Matey, J. (2021). Bank liquidity risk and bank credit risk: Implication on bank stability in Ghana. *International Journal of Scientific Research in Multidisciplinary Studies*, 7(4), 1-9.
- Mensi S, Labidi W. (2015). The effect of diversification of banking products on the relationship between market power and financial stability. *American Journal of Economics and Business Administration*, 7(4), 185.
- Matey J. (2021). Bank liquidity risk and bank credit risk: Implication on bank stability in Ghana. *International Journal of Scientific Research in Multidisciplinary Studies*, 7(4), 1-9.
- Onuorah, A.C., Ehiedu, V.C. & Egugbo, R. U. (2023). Camels rating and its effects on fugaz banks' performance in Nigeria. *Journal of Xidian University*, 17(2), 248-257.
- Ozili, PK. (2018). Banking stability determinants in Africa. *International Journal of Managerial Finance*.

Sang Tang My ANQ. (2022). The relationship between credit risk and bank financial stability: The mediating role of bank profitability. *Journal of Hunan University Natural Sciences*, 49(1).

Setiawan A, Sudarto S, Widiastuti, E. (2021). The influence of credit risk and liquidity risk on bank stability. *ICORE*, 5(1).

Siyanbola TT, Adebayo KK. (2021). Credit risk management and financial sustainability of listed deposit money banks in Nigeria. *Quest Journals Journal of Research in Business and Management*, 9(6), 64-77.