ISSN:1533-9211
SEYBOLD Journal REPORT
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Banking Sector Stability Effect on Economic Growth in Nigeria

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ISSN:1533-9211
SEYBOLD Journal REPORT
www.seybold-report.com

ISSN: 1533 - 9211

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KEYWORDS:

Bank stability, Nigeria, performance, economic growth

Received: 05 January 2024
Accepted: 22 January 2024
Published: 07 February 2024

TO CITE THIS ARTICLE:

Edet, I. V., Emiesefia, J. A., George, S., & Agama, E. J. (2024). Banking Sector Stability Effect on Economic Growth in Nigeria. *Seybold Report Journal, 19*(02), 6-20. DOI: 10.5110/77. 1106

Abstract

This study assesses the effect of banking sector stability on economic growth in Nigeria using the dynamic ARDL bounds approach. The study covers the period from 2005-2022 and utilises indicators such as the banking stability index, return on assets, financial depth, interest rate, and real GDP as proxies for economic growth. The Bounds test results indicated the presence of a long-run nexus among the study variables. A unit increase in bank stability, financial depth, and bank performance has a positive and statistically significant effect on economic growth. The CointEq(-1) of -0.71 indicates that the 71% divergence caused by banking sector instability converges back to the long-run equilibrium with the first quarter of the current year. The findings reveal that the banking sector stability spurs economic growth in Nigeria. High interest negatively influences economic activities, and moderate interest is recommended to foster economic growth. The lending to the real sector falls below the optimal level. The study recommends regulatory improvements in both micro- and macro-prudential approaches. It also advocates the strict implementation of the Basel Accord to enhance Nigerian banks' international competitiveness.

1.0 Introduction

Globally, banking sector stability has been acknowledged as the central pillar of financial sector growth and, by extension, the global economy. The 2008 global economic crisis triggered by the collapse of the subprime mortgage market in the United States, collateralised debt obligations (CDOs) caused by financial institutions bundling mortgages into complex financial products, leverage and overborrowing of banks, global interconnectedness through economic transactions and derivatives markets, weak regulatory oversight in various countries, persistent trade imbalances, particularly the U.S. trade deficit, created financial vulnerabilities, loss of confidence, and bank runs collectively led to severe economic and financial recession that destabilised the global financial and economic web, eroded trust in the Nigerian financial markets, and led to a decline in demand for exports from countries like Nigeria and reduced foreign investment inflow into Nigerian markets. The ripple effect of the 2008 global financial crisis and the 1997–98 Asian financial crisis collectively regenerated the discussion on the recasting of the Basel II Capital Framework to a more standardised framework to address the shortcomings in the regulatory framework in the international banking sector and strengthen financial sector solvency through banks' stability. The 1952 Nigerian banking ordinance was promulgated, along with the Basel III framework, as a comprehensive set of international banking regulations to enhance financial institutions' stability, resilience, and risk management practices. Over the decades, their implementation in Nigeria has significantly improved the banking sector's stability and spurred economic growth (Ali & Puah, 2018; Dao et al., 2020; Shair et al., 2021; Yin, 2019; Wang et al., 2019; Eweke, 2019; Ali & Puah, 2018).

Theoretical underpinning posits that financial sector stability through bank stability enhances fund mobilisation and allocation to economic agents while reducing transaction costs and increasing customer service satisfaction, profitability, and economic performance decrease due to banking sector instability (Nguyen, 2020). However, the 2017 financial crisis in Nigeria and its ripple effect on the economy has once again spurred the need to examine and craft a robust framework for monitoring the stability of the Nigerian banking sector.

Antoniades et al. (2019), Bebeji (2013), and Sanusi (2011) attributed the fragility of the banking system to various interdependent factors not limited to macroeconomic volatility, corporate governance deficits, lack of transparency, regulatory gaps, patchy supervision, unstructured management, and NPL caused by weak business climate in Nigeria. The recent bailout funds of

₦700 billion (approximately USD 2 billion) to Polaris Bank (former Skye Bank) by the Central Bank of Nigeria (CBN) encapsulate the real-world repercussions of inadequate risk management and non-adherence to prudential norms (Antoniades et al. 2019, Sanusi 2011; Bebeji, 2013).

Extant studies assessing bank stability over the period have focused significantly on developed countries considered the epicentre. These studies ignore the ripple effect on the emerging financial sector, such as Nigeria, which suffered from a decline in foreign direct investments, portfolio investment markets, and significant exports, such as oil, capital market volatility, illiquidity, and exchange rate pressures. However, studies examining this nexus in Africa and Nigeria are scarce due to bureaucratic hurdles in the regulatory environment, and few studies conducted in Nigeria have focused on the cost of bank failures and economic growth.

This study contributes to the extant literature on three frontiers: a) the impact on bank-specific variables: bank size and performance indicators, b) the economy, and c) financial system risk factors (Ali & Puah, 2018; Nguyen, 2020). The macro-prudential policy indicator of the Capital Adequacy Ratio (CAR) was adopted as the ratio of banks' regulatory capital to the bank's risk-weighted assets (Klingelhöfer & Sun, 2019; Yin, 2019).

2.0 Literature Review

The global trend in the financial crisis has significantly triggered regulatory and supervisory authorities' concern about the need to develop early distress warning signals, causes, and stability measures. As such, Kaminsky and Reinhart (1998) developed currency-banking crisis model detection. Using the signal extraction approach, constructed from a (0-1) binary variable, where (0) denotes no crisis and (1) a crisis. However, the model revealed about 105 possible indicators of crisis and 43 vital indicators, such as credit growth, international reserves, inflation, real gross domestic product, and others.

In contrast, Nicholas et al. (2010) argued that the Kaminsky and Reinhart (1998) model is suitable for evaluating the state of the domestic banking sector and is less informative. Nicholas and Isabel (2010) reveal that the absence of a colossal local financial crisis does not translate into a crisis-free sector.

Alternatively, Doguwa (1996) developed an early warning detector for Nigerian commercial and merchant banks, using a logit-analytic technique and financial ratios. The model identifies banks on the verge of collapse. Similarly, in developing an early-warning model, Jide (2003) used the instrumental variables-generalised maximum entropy formalism to evaluate the prospect of the sector undergoing distress. The dynamic procedure underlying the transition from a sound bank to a closure utilises a transition probability matrix. Thus, there is a positive relationship between the explanatory variables and the model's acceptability for the evolution of bank failure dynamics.

Under macro-prudential regulatory frameworks, scholars have developed one-stop indices linking domestic and external macroeconomic variables to serve as signals. In Turkey, the Central Bank used the six sub-indices of capital adequacy, asset quality, liquidity, productivity, rate of exchange, and interest rate risks in 2006 to form the financial strength index.

In Nigeria, Sere-Ejembi, Udom, Salihu, Atoi, and Yaaba (2014) blend indicators of financial soundness and macro-fundamentals to create the banking system stability index (BSSI). The results show the efficacy of the BSSI as an early warning signal, spotting potential threats and aiding monetary authorities in formulating proactive policy measures to avert such crises.

Altunbas et al. (2018) constructed an aggregate index for 61 banks in 61 emerging and advanced economies. Using the dummy variables, (+1) denotes the stringent macroprudential policy tool, and (-1) represents easing. This indicates that macroprudential policy significantly influences banks' risk factors, with diverse effects on banks. In China, the narrative approach was adopted by Klinghoffer et al. (2019) to distinguish monetary policy and its aims. To assess the efficacy of these indicators on the Chinese macroeconomic and financial climate from 2000 to 2015. We adopted the VAR model framework Altunbas et al. (2018) used to assess bidirectional causality. The results demonstrate the efficacy of both macroprudential and monetary policies in restraining extreme credit growth.

In evaluating prudential measures' influence on bank performance in Nigeria, Okafor et al. (2018) adopted the GMM technique to assess the systemic importance of banks (SIBs), small and foreign banks. The results indicate that a bank's leverage and liquidity environments influence its performance.

Theoretical literature indicates that the greater the z-score value, the greater the banking sector stability. Empirical studies by Adusei (2015) and Ali and Puah (2018), among others, adopted the z-score for the analysis of bank stability and observed that bank stability is characteristically supported by measures of both size and total assets; expansion in bank size indicates financial market stability. Regarding macroeconomic factors, the nexus among inflation, GDP, and bank stability in Pakistan is negative. This signifies that a unit increase in macroeconomic indicators diminishes bank stability (Ali et al., 2018). The negative effect can be attributed to the banking system's inability to predict the price adjustment of its services.

3.0 Theoretical Framework

a. Micro-Prudential Approach

The regulatory and supervisory objectives of both micro-macro-prudential approaches are intertwined. As such, the actualisation of the macro-prudential regulatory objective depends on its degree of impact on regulation and supervision at the micro-prudential level. Correspondingly, the aim of achieving a sound and stable banking system without satisfactorily integrating macro-level developments diminishes the micro-prudential potential of achieving its objectives. The theoretical reviews on merit linking and the micro-macro prudential approaches to ensuring stability and safety for the banking system revealed that micro-prudential regulation focuses on financial system mechanisms' stability and soundness, while on the other hand, assuming a partial-equilibrium state to avert individual financial institution failures. The micro-prudential guideline is underpinned by banks financing their operational and business activities with insured deposits from the government. According to Bryant (1980) and Diamond and Dybvig (1983), deposit insurance could efficiently prevent runs. However, it could induce bank managers to take excessive risks with the knowledge of losses borne by the taxpayer. When the deposit insurer's risk loss minimises, micro-prudential regulation tends to accomplish its objective. Capital regulation focuses on banks' ability to absorb losses internally, protect insurance depositors' funds, and control any moral hazard as its primary objective. However, the presumption is underpinned by the cognition of a bank taking strategic decisions to reinstate its capital ratio in the aftermath of losses.

Criticisms

The regulatory interest of the micro-prudential regulator is not how nearly collapsed banks restore their capital ratio through the numerator (raising new capital) or denominator (shrinking assets). However, Sere-Ejembi et al. (2014) reveal that such micro-prudential regulatory interests are permissible when emphasising a distressed bank. Where the bank prefers to shrink its assets, others pick up the slack, and the healthy Darwinian process is resounded. The market share is transferable from fragile banks to healthy peers.

Banks' asset reduction leads to credit crunch and fire sales, according to Diamond et al. (2009) and

Shleifer et al. (2010), and the effect is interconnected. Banks shrink their assets by plummeting fresh loans, investments, and employment opportunities. When the bank discards the same illiquid securities, the value of these securities declines geometrically. The real costs of fire sales manifest in credit crunch excavation in market equilibrium, and new capital floating is naturally a preferable option.

b. Macro-Prudential Approach

The use of the general equilibrium condition by macro-prudential regulators is to protect the financial system and cover systemic accumulating risk. However, the safety and dependability of individual financial institutions do not translate into financial system stability (Ananthakrishnan, Heba, & Pilar, 2016, as cited by Eweke, 2019). Systemic risk is a function of exposure to institutions with equivalent risk factors (Charles, 2015, as cited by Eweke, 2019).

From the reviews of theoretical literature, it can be inferred that macro-prudential regulation is a combination of externalities and mood swing patterns. Externalities emphasise pecuniary externality, which is triggered by the action of economic agents that affect each other through the price channel. Keynes (1936) observed that the mood swings paradigm triggers superfluous confidence in good times and that the downside of unexpected risk cutback influences the behavioural activities of financial institutions' managers. Hence, the pricing signals of financial markets may be inept while increasing the prospect of a systemic crisis. In this case, macro-prudential regulators' arguments are justified.

Ananthakrishnan et al. (2016), as cited by Eweke (2019), posit that the ideal macro-prudential policy framework should encompass:

1. A system of early warning indicators of liabilities
2. Policy tools comprised risks ex-ante, addressing the susceptibilities early, and building a buffer to absorb shocks ex-post.
3. Operative identification of systemic risks and macro-prudential policy implementation.

Stylised Facts

This study adopts the approach of Atoi (2018) and Akpan (2017) to develop a stability index for the Nigerian banking system. Stability was proxied by a Z-score and expressed as:

$$Zscore_{it} = \frac{EAT_{it} + ROA_{it}}{\delta_{ROAit}}$$

(Hannan & Hanweck, 1988).

Where: EAT_{it} = equity-to-asset ratio in the bank I at time t

ROA_{it}, = return on assets in bank i and the time t

δROA_{it} = standard deviation of the sample

$Zscore_{it}$, =bank'ss stability

The Z-score is extensively applied in bank stability assessments, particularly for its ease of use (Adusei, 2015; Ali & Puah, 2018; Klingelhöfer & Sun, 2019). A Z-score of (≥50%) represents stability and (≤ 49% represents) a fragile system.

The CAR macroprudential policy indicator measures the regulatory capital ratio to banks' risk-weighted assets. The CAR is expressed as

Totalbank'ss regulatory capital

Risk-weighted assets.

The policy threshold:

a. Not < 10% for Regional and National banks;
b. Not < 15% for International Banks and
c. Not < 15% for Systemically Important Financial Institutions (SIFIs). It is a broad measure of capital adequacy.

Econometric Procedure

The study variables consist of Real Gross Domestic Product (*RGDP*) proxied by economic growth, the banking system stability index (BSI), and return on assets (ROA) proxied by banking sector performance; Financial Depth (F.D.) takes into account bank size, institutions, and markets—Interest Rate (INT) proxied borrowing cost. The dataset was collated from the Global Financial Development" database, the Global Economic Prospect database, and the World Bank databank. The ARDL and the Granger Causality models were employed to test for the long-run causal-effect nexus from 2005-2022.

RGDP= f (BS1, ROA, FD, CAR, INT) ………………………………………….. (Eq2)

The double log-linear model is specified as

$$logRGDP_{it} = \beta_o + \beta_1 logBSI + \beta_2 logROA + \beta_3 logFD + \beta_4 INT + \beta_5 logCAR + \varepsilon_{it} \text{ ………..(Eq3)}$$

To confirm linearity and deal with heteroscedasticity. The Autoregressive Distributed Lag (ARDL) model methodology was proposed by Pesaran and Shin (1999) and expanded by Pesaran, Shin, and Smith (2001). The model represents the nexus between the current value (bank stability and economic growth) and past values (bank stability and economic growth) in the time series and was adopted for its advantages in handling small data samples and variables integrated from diverse orders I (1) and I (0). The model eradicates serial correlation and variable endogeneity glitches to test for the long-run nexus, as specified in (Eq2): The coefficients of the lagged variables capture the long-run nexus, while coefficients of the differenced variables capture the short-run dynamics.

$$\Delta logRGDP_t = \alpha_0 + \beta_1 logBSI_{t-1} + \beta_2\ logROAt_{-1} + \beta_3 logFD_{t-1} + \beta_4 INT_{t-1} + \beta_5 log\mathrm{CAR}_{t-1} + \sum_{i=1}^{n} \varphi_h \Delta logRGDP_{t-1} + \sum_{i=1}^{n} \phi i \Delta logBSI_{t-1} + \sum_{i=1}^{n} \lambda j \Delta logROA_{t-1} + \sum_{i=1}^{n} \underline{\omega} k \Delta logFD_{t-1} + \sum_{i=1}^{n} \rho l \Delta INT_{t-1} + \sum_{i=1}^{n} \Psi l \Delta log\mathrm{CAR}_{t-1} + \nu t \text{ ....(Eq4).}$$

Equation 4 is the baseline long-run model.

Where Δ is the first difference operator, α_0 = intercept, $\beta_{1;} - \beta_5$ = long-run multipliers. δ, ϕ, λ, $\underline{\omega}$, ρ, Ψ = short-run parameters, and νt = error term.

Equation (4) is used to assess the long-run nexus: The null hypothesis of no long-run nexus was tested against the alternative hypothesis.

H_0: $\alpha = (\beta_{1)} =(\beta_5) = 0$, *no co-integration.*

H_1: $\alpha \neq (\beta_1) \neq (\beta_5\ ) \neq 0$ *co-integration.*

The decision rules:

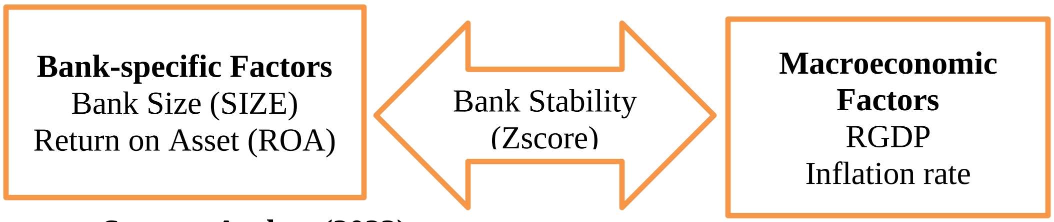
a. If the computed F-stat is lower than the critical bound value (no co-integration).
b. If the computed F-stat is higher than the upper-bound value (co-integration).
c. If the computed F-stat falls between the upper and lower bound values, then = (inconclusive).

To correct for the short-run error in the presence of co-integration in the series, the model was developed by modifying equation 4 as follows:

$$\Delta logRGDP_t = \mu_0 + \sum_{i=1}^{n} \varphi_h \Delta\ logRGDP_{t-1} + \sum_{i=1}^{n} \phi i \Delta logBSI_{t-1} + \sum_{i=1}^{n} \lambda j\ \Delta logROA_{t-1} + \sum_{i=1}^{n} \underline{\omega} k \Delta logFD\ _{t-1} + \sum_{i=1}^{n} \rho l \Delta logINT_{t-1} + \sum_{i=1}^{n} \Psi l \Delta log\mathrm{CAR}_{t-1} + \vartheta ECT_{t-1} + \nu t \text{ ....(Eq5).}$$

Where ϑ = speed of converging to long-run equilibrium from system shock; ECT-1= = = residual obtained from equation (5). The lagged error correction term coefficient (ϑ) is expected to be negative and statistically significant, confirming the existence of a cointegrating nexus.

Figure 1: Conceptual Framework



Source: Author (2023)

Results and Discussion of Findings

Unit Root Test

This study utilised the Augmented Dickey-Fuller (ADF) and Phillips-Perron (P.P.) tests to assess the order of integration among the variables and ensure an unbiased estimation according to the Gauss-Markov conditions. The results are presented in Table 1.

Table 1. Unit Root Test Results

Variables	**ADF Test**	**Order of integration**	**P.P. Test**	**Order of integration**	**Inference**
LogROA	-5.067558***	I (0)	-5.180230***	I (1)	Stationary
LogFD	-6.956371***	I (1)	-6.924938***	I (0)	Stationary
INT	-7.818115***	I (0)	-9.498115***	I (1)	Stationary
LogBSI	-10.64328***	I (1)	-11.96228***	I (1)	Stationary
LogRGDP	-5.28938***	I (1)	-6.541705***	I (0)	Stationary
LogCAR	-5.2803***	I (0)	-6.7652****	I(1)	Stationary

Source: Author (2023) *** *indicates significance at 5%; the Test includes Trend and Intercept*

The unit results show that the study variables attained stationarity at 1 and 0 integration levels. This combination provides credibility for our study to test for co-integration. The test results essentially met the Gauss-Markov conditions for an unbiased estimation.

Estimation of the ARDL Model

Table-2. The ARDL model result.

Dependent Variable: RGDP				
Model selection method: Akaike info criterion (AIC)				
Variables	Coefficient	Std. error	T-Statistics	Prob.
LogROA	20.3077	4.9241	4.1241	0.0004
LogFD	0.6579	0.1546	4.2538	0.0002
INT	-9.3815	2.8993	-3.2358	0.4341
LogBSI	22.2455	5.40158	5.5395	0.0000
LogCAR	22.7671	5.0159	4.5390	0.0000

C	0.59.71	12.3469	0.04822	0.9632
Other Parameters Estimate				
R^2	F-stat	DW Stat	Prob	
0.98	1116.72	2.57	0.000	

Source: Author (2023)

Table-3. The ARDL Long-Run Cointegrating Result.

F-Bound Test				
Test Statistics	Value	Sign in.	I (0)	I (1)
			Asymptotic: n=1000	
F-Statistics	15.39791	10%	2.08	3
		5%	2.56`	3.59***
		2.5%	2.88	3.87
		1%	3.29	4.37

***at 5% level of significance.
Source: Author (2023)

The ARDL results in Table 2 show a statistically significant positive relationship between the banking stability index (BSI), Capital Adequacy Ratio (CAR), bank performance (ROA), and economic growth (RGDP). e observed a positive and significant influence on bank size. Thus, larger banks enhance their stability positively. This finding is consistent with Nguyen (2020). Abank's size significantly lowers bankruptcy costs and enhances its growth rate. Adusei (2015) substantiates these results and contradicts the findings of Ali et al. (2018) in Pakistan. According to Adusei (2015), the banking system is considered the life force of any economy, through which liquidity is mobilised and allocated in line with Basel III requirements. Nguyen (2020) found that bank size is linked to more excellent performance.

The results further reveal that bank performance (ROA), banks' capital adequacy ratio (CAR), bank size, and bank stability (BSI) increase economic growth by 20.3%, 22.76%, 0.66%, and 22.2%, respectively. This implies that a 1% increase in CAR increases the banking sector stability by 22.76%, outperforming the 10% minimum policy requirement. The findings show the efficacy of the prudential guidelines in its reputation as more rigorous than the international pact with an 8% minimum ratio. From the results, it can be inferred that the nexus between BSI and INT is within the policy maximum of 80% of the lending-to-deposit ratio to improve the banking system's stability. This finding substantiates the CBN policy mandate of 65.0% and the bank's loan-to-deposit ratio. The R^2 of 98% shows the model reliability and goodness of fit of the tested hypothesis. The F-statistic value of 15.397 in Table 3 exceeds the upper-bound critical value at the

5% probability level. The null hypothesis of no cointegration was rejected.

Table 4 Short run Error Correction Model Result.

Variables	Coefficient	Std. Error	T-Statistics	Prob.
ECT_{t-1}	-0.7108***	0.0632	-11.2433	0.0000
C	0.7656***	0.3360	9.2788	0.0000

Source: Author (2023)

The CointEq(-1) value of (-0.710) reported in Table 4 is rightly signed as "negative and statistically significant." The CointEq(-1) value of 0.71 indicates a 71% short-run divergence, and in the previous year, caused by banking sector instability, congregates back to the long-run equilibrium within the first quarter of the current year.

Conclusion, Policy Implications, and Areas for Further Research

This study assessed the effect of banking sector stability on economic growth in Nigeria as its primary objective. To achieve this objective, an ARDL/bounds test framework was adopted. The findings reveal that ROA, bank size, and BSI are related to RGDP in Nigeria. Conversely, interest rates negatively influence RGDP and do not significantly influence it. A negative lending rate is required for bank stability, as lending to the real sector is below the optimum.

Among other things, this study recommends intensive review by regulators to enhance micro-prudential and macro-prudential supervision of the industry, strict implementation of the Basel accord recommendations to enhance the international competitiveness of Nigerian Banks, and encouraging banks to increase their loans and advance to the real sector at lower interest rates.

COMPETING INTERESTS

The authors have no compting interest to declare.

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HOW TO CITE THIS ARTICLE:

Edet, I. V., Emiesefia, J. A., George, S., & Agama, E. J. (2024). Banking Sector Stability Effect on Economic Growth in Nigeria. *Seybold Report Journal*, *19*(02), 6-20. DOI: 10.5110/77. 1106

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