Monetary Policy, Institutional Quality and Banking System Fragility in Nigeria

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ABSTRACT

The banking sector is dependent on the economy and environment in which it operates for survival and stability. Lack of effective and efficient institutions and bad monetary policies may spell doom for a country's banking system. In Nigeria, over the years, many banks did not become distressed, they have folded up as a result of problems relating to institutional quality and unfriendly monetary policies. This study, therefore, examined the effect of both institutional quality indicators and monetary policies on the fragility of the Nigerian banking system from 2000 to 2022.

We used a dataset comprising six institutional quality and three monetary policy variables as well as the banking system fragility indices for the period 2000 – 2022. Having examined the statistical properties and conducted some pre-estimation tests, we employed the autoregressive distributed lag (ARDL) technique to determine the short and long run effects of the institutional quality and monetary policy variables on the banking system fragility index for the period.

We found that, in the short run, in terms of institutional quality, only voice and accountability index had a declining effect on banks' stability (worsening fragility) while with respect to monetary policy, loan-deposit ratio had a positive effect on the fragility index (reducing fragility). In the long run, neither the institutional quality nor the monetary policy variables have significant effect on the fragility index of the Nigerian banking system during the period.

We conclude that institutional quality and monetary policy affect the Nigerian banking system fragility significantly in the short run and that the former have no significant effect on the latter on the long run. We recommend a focused approach on institutional reforms and periodic assessments and adjustments of the reforms, capacity building, improvement of institutional coordination, and ensuring that policies are not only well-designed but also effectively implemented and a continuous fine-tuning of monetary policies to adapt to changing economic conditions.

Keywords: Institutional quality, monetary policy, BSFI, ARDL.

INTRODUCTION

In recent years, the stability of banking systems has garnered significant global attention due to their essential role in economic development and financial stability ((Baum et al., 2021; Zeqiraj et al. 2020). Institutional quality, which includes the effectiveness of institutions in managing economic activities, enforcing regulations, and upholding the rule of law, is a critical factor contributing to the fragility of the banking system (Nguyen & Dang., 2022).

Nigeria, as a key African economy, has faced numerous challenges in maintaining the stability of its banking sector. The sector has repeatedly experienced fragility, marked by susceptibility to external shocks, high levels of non-performing loans, and insufficient regulatory oversight. Despite the efforts of monetary authorities to implement sound policies, the ongoing fragility of the banking system highlights deeper structural issues. This study aims to explore the relationship between institutional quality, monetary policy, and banking system

fragility in Nigeria, providing insights for policymakers and stakeholders to enhance financial stability. Historically, the Nigerian banking system has been influenced by various factors, including political instability, weak institutional quality, and inadequate regulatory frameworks. According to Acemoglu and Johnson (2005), the effectiveness of institutions in governing economic activities, enforcing regulations, and ensuring the rule of law is a key determinant of banking system stability. However, Nigeria's institutional quality has been compromised by corruption, rent-seeking behavior, and regulatory capture, which have eroded investor confidence and weakened the credibility of monetary policy interventions (Adegbite et al., 2017).

Despite the concerted efforts of monetary authorities to implement sound policies and regulatory reforms, the persistence of banking system fragility in Nigeria underscores the need for a deeper understanding of the underlying structural issues. The Nigerian banking sector continues to face challenges such as weak corporate governance practices, inadequate risk management frameworks, and regulatory arbitrage. These challenges have implications not only for financial stability but also for broader macroeconomic outcomes, including inflation, exchange rate volatility, and economic growth.

The relationship between the effectiveness of monetary policy, institutional quality, and banking system fragility in Nigeria is complex and multifaceted. While monetary policy tools such as interest rate adjustments, reserve requirements, and open market operations are intended to influence the behavior of banks and financial intermediaries, their effectiveness depends on the broader institutional environment (Uchendu & Nkalu, 2019). Weak institutional quality undermines the transmission mechanism of monetary policy, resulting in suboptimal outcomes and unintended consequences for banking system stability.

Theoretically, the influence of robust regulation on stability varies. Public interest perspectives suggest that market failures require formal regulatory bodies to address stability issues and enhance efficiency (Bace et al., 2020; Duru et al., 2020). These researchers discovered that the effects of bank accounting regulations are more significant in countries with stringent enforcement within the banking sector. Numerous empirical studies concur that regulations bolster stability by mitigating risk (Alley, 2022; Karim et al., 2021), with stricter rules enhancing bank risk management.

From a private interest perspective, there is skepticism about whether regulatory authorities can effectively counteract market failures to optimize banking functions. Market obstacles such as informational and enforcement costs can hinder private oversight, while government failures could have adverse effects if regulators are empowered, potentially causing more harm than good (Bace et al., 2020). In practical situations, official supervisors might overlook market flaws, direct credit to affiliated companies, or succumb to banking influences; this phenomenon is known as the lobby theory.

The literature indicates that the impact of banking regulations on stability may depend on governance, sector characteristics, and macroeconomic conditions (Klomp & de-Haan, 2015). Specifically, institutional quality can influence the effect of regulations on stability by enhancing enforcement capacity, which is crucial given the evolving complexity of Basel I, II, and III norms (Haldane & Neumann, 2016). According to Godspower-Akpomiemie and Ojah (2021), market discipline is essential for banking effectiveness. Therefore, institutional quality may complement regulation and foster stability.

This study examined the effect of IQ indicators and MP tools on the fragility index of the Nigerian banking system from 2000 to 2022. It achieves two main objectives: Firstly, it examined the short and long run effects of IQ on banking system fragility in Nigeria and, secondly, it investigated the short and long run effects of monetary policy tools on banking system fragility in Nigeria. The null hypotheses guiding this research is that IQ and MP indicators did not significantly affect the Nigerian banking system fragility index in the short and on the long runs during the period 2000 – 2022. Using the banking system fragility index estimation model proposed by Kibritcioglu (2003), this study provides novel insights into the IQ and MP variables that significantly affect (or otherwise) Nigerian banking system fragility index during the period. These insights will be valuable not only to researchers but also to policymakers, who can use the results to align their future policies with the goal of financial system stability.

LITERATURE REVIEW

Institutional Quality, Monetary Policy and Banking System Fragility

With respect to economic development, the stability of banking systems is of utmost importance as they are crucial for financial intermediation and resource allocation. Nigeria, a prominent player in the African economy, has faced continuous challenges in maintaining a stable banking system. Allen and Gale (2007) highlight that a stable banking system is essential for efficient capital allocation, effective risk management, and overall economic growth. However, the Nigerian banking sector has been plagued by recurrent episodes of fragility, marked by susceptibility to external shocks, high levels of non-performing loans, and inadequate regulatory oversight.

Monetary policy tools such as interest rate adjustments, reserve requirements, and open market operations play a critical role in influencing the stability of banking systems. In Nigeria, however, the effectiveness of these monetary policy transmission mechanisms is often impeded by structural bottlenecks, including limited financial deepening, fragmented regulatory frameworks, and weak institutional capacity (Uchendu & Nkalu, 2019). As a result, monetary policy actions can have unintended consequences, exacerbating rather than alleviating banking system fragility.

Institutional quality is a key determinant of the performance and resilience of banking systems. Acemoglu and Johnson (2005) argue that well-functioning institutions reduce uncertainty, enforce contracts, and boost investor confidence, thereby mitigating the risk of banking crises. In Nigeria, weak institutional quality, characterized by corruption, political instability, and inadequate legal frameworks, undermines the effectiveness of regulatory oversight and diminishes the credibility of monetary policy interventions (Adegbite et al., 2017).

Despite these challenges, the Nigerian banking system has shown resilience to various shocks, including domestic and external economic disruptions, financial crises, and regulatory challenges (Godspower-Akpomieme & Ojah, 2021). Even with periodic vulnerabilities and sectoral weaknesses, Nigerian banks have managed to navigate challenges and maintain stability, aided by regulatory interventions, prudential measures, and improved risk management practices. The regulatory framework of the Nigerian banking system is overseen by the Central Bank of Nigeria (CBN), which is responsible for licensing, supervising, and regulating banks and financial institutions (Central Bank of Nigeria, 2020). The CBN operates under the Banks and Other Financial Institutions Act (BOFIA), with a mandate to promote monetary stability, ensure financial system stability, and safeguard depositor funds. This regulatory framework encompasses prudential regulations, capital adequacy requirements, liquidity standards, and risk management guidelines aimed at ensuring the soundness and stability of the banking sector.

Effective risk management practices are crucial for the stability of the Nigerian banking system, addressing various types of risk including credit risk, liquidity risk, operational risk, and systemic risk (Central Bank of Nigeria, 2020). Nigerian banks are required to implement robust risk management frameworks, including comprehensive credit assessment processes, stringent loan provisioning standards, advanced stress testing methodologies, and detailed contingency planning mechanisms. Furthermore, the CBN conducts regular supervisory assessments and stress tests to evaluate banks' risk profiles, capital adequacy, and resilience to adverse shocks.

Despite the resilience demonstrated by the Nigerian banking system, several challenges continue to threaten financial stability, including macroeconomic vulnerabilities, regulatory gaps, and systemic risks (Central Bank of Nigeria, 2020). Macroeconomic vulnerabilities, such as high inflation rates, exchange rate volatility, and fiscal deficits, can strain banks' balance sheets, impair asset quality, and erode confidence in the financial system. Regulatory gaps, such as deficiencies in prudential supervision, weak enforcement mechanisms, and inadequate resolution frameworks, complicate effective risk management and crisis resolution. Systemic risks, including interconnectedness, concentration risk, and contagion effects, amplify the impact of individual bank failures and external shocks, posing significant threats to financial stability.

The CBN has implemented various policy responses and mitigation measures to address these challenges to financial stability in Nigeria (Central Bank of Nigeria, 2020). These measures include strengthening prudential regulations, enhancing supervisory oversight, improving risk-based supervision, and promoting financial inclusion initiatives. Additionally, the CBN has intervened in distressed banks, recapitalized weak institutions, and provided liquidity support to maintain confidence and stability in the banking system. Furthermore, the implementation of the Nigerian Financial Stability Framework (NFSF) aims to enhance systemic risk monitoring, establish early warning mechanisms, and develop crisis management frameworks to safeguard financial stability and mitigate systemic risks.

Theoretical Literature

Agency Theory in Banking

Agency theory addresses the conflicts of interest that arise between principals (owners or shareholders) and agents (managers) within firms. In the context of banking, shareholders aim to maximize their returns, while managers may pursue personal benefits such as job security or bonuses, potentially compromising the bank's long-term stability. Poor institutional quality exacerbates these conflicts. Weak regulatory frameworks and insufficient oversight allow managers to engage in riskier behavior without adequate checks and balances. For instance, managers might undertake high-risk investment strategies or extend excessive credit to unqualified borrowers to boost short-term profits, increasing the likelihood of bank failure. Robust institutions, characterized by strong regulatory and legal systems, mitigate these risks by enforcing transparency and accountability, aligning the interests of managers with those of shareholders and depositors ((Jensen & Meckling, 1976).

Moral Hazard in Banking (Krugman, 1979)

According to Krugman (1979), moral hazard occurs when a party is insulated from risk and therefore has an incentive to take on greater risk than they otherwise would. In banking, this can happen when banks believe they will be bailed out by the government in the event of failure. This belief encourages them to engage in riskier behavior, such as making subprime loans or investing in speculative assets. Poor institutional quality exacerbates moral hazard. Weak enforcement of regulations, inadequate supervision, and corruption prevent effective risk management and increase the likelihood of reckless behavior. If banks expect that regulatory institutions will not enforce penalties or allow them to evade responsibilities, they are more likely to take excessive risks, increasing their fragility.

Financial Accelerator Theory

Developed by Bernanke, et al. (2996), the financial accelerator theory posits that economic shocks are amplified by their effects on the financial health of borrowers and lenders. Changes in monetary policy impact borrowing costs and financial conditions of firms and households. In a high-quality institutional environment, these effects are transmitted more effectively due to reliable enforcement of contracts and property rights, enhancing financial transaction stability and predictability. Strong institutions mitigate the adverse effects of monetary shocks by ensuring that financial markets function smoothly and by maintaining confidence in the banking system. Conversely, in environments with poor institutional quality, the transmission of monetary policy is less effective, and financial shocks can lead to significant instability and bank fragility. Poor institutions lead to mispricing of risk, lack of transparency, and reduced effectiveness of monetary interventions, exacerbating financial instability.

Institutional Quality and Financial Stability Theory

According to Beck, et al, (2003), this theory emphasizes the role of institutional quality in ensuring financial stability. High-quality institutions, such as effective legal systems, regulatory frameworks, and governance structures, enhance transparency, reduce corruption, and improve the overall governance of banks. These factors contribute to a stable financial environment by promoting sound banking practices, effective risk management, and accountability. Weak institutions, on the other hand, lead to higher bank fragility by allowing malpractices such as corruption, fraud, and inadequate risk management to proliferate. Poor institutional quality results in a

lack of trust and confidence in the financial system, which can trigger bank runs and systemic crises. Therefore, improving institutional quality is crucial for maintaining financial stability and preventing banking crises.

Theory of Optimal Bank Regulation

This theory focuses on the role of regulation in mitigating the risks inherent in banking. Optimal regulation should aim to align the interests of bank managers with those of depositors and the broader financial system. Effective regulation requires strong institutions capable of enforcing rules, monitoring compliance, and imposing penalties for violations. Strong institutions ensure that regulations are designed and implemented effectively, reducing the likelihood of bank failures. They provide a framework for prudent banking practices, such as maintaining adequate capital reserves, conducting regular audits, and managing risks appropriately. In contrast, poor institutional quality can result in weak regulatory frameworks that fail to prevent excessive risk-taking, leading to increased bank fragility (Calomiris & Kahn, 1991).

Empirical Literature

Empirical studies have explored various banking and monetary policies, revealing that these measures can enhance stability (Shaddady & Moore, 2019). A significant focus is on curbing bank risk-taking to comply with such regulations. The theoretical perspectives on the effects of capital regulations on risk are mixed. For instance, implementing capital constraints reduces overall portfolio risk (Kim & Santomero, 1988). However, depending on their risk appetite, banks might pursue higher-return, riskier assets, increasing the likelihood of default (Tongurai & Vithessonthi, 2020). On the other hand, higher capital requirements can reduce risk-taking, aligning with regulators' intentions (Santos, 2001). Some empirical studies agree that monetary policies related to capital regulations enhance bank capital and reduce risk (Akter et al., 2018).

Recent research provides nuanced insights into the context of capital regulation and its impact on bank risk-taking. Ashraf et al. (2020) conducted an international analysis of the relationship between capital regulation, deposit insurance, and bank risk during both normal and crisis periods. They found that stringent capital regulations effectively reduce bank default risk, regardless of the presence of explicit deposit insurance. However, Jiang et al. (2020) found that in China, an excessive buildup of capital buffers might lead to greater risk-taking among high-risk banks, suggesting that continuously increasing capital requirements does not necessarily reduce risk, highlighting the need for a more nuanced approach to capital regulation. These studies underscore the complexity of capital regulation and its multifaceted impact on bank risk-taking behavior, necessitating a careful balance in regulatory policies. Capital requirements, therefore, can curb risk-taking incentives (Chiaramonte et al., 2020).

However, under certain conditions, such requirements can increase bank risk-taking (Koehn & Santomero, 1980). For example, forced recapitalization to meet regulations may reduce share prices (Barth et al., 2004; Kopecky & VanHoose, 2012). This effect may be exacerbated by continuously increasing capital requirements, leading to greater risk-taking for high-risk banks (Jiang et al., 2020). Barth et al. (2001) indicated that a World Bank survey revealed more restrictions are associated with major crises and declining sectoral efficiency. Ashraf et al. (2020) and Anginer et al. (2021) found that the quality of capital plays a pivotal role in reducing bank risk, emphasizing the complex relationship between monetary and banking policies, risk-taking, and efficiency in the banking sector.

Sodokin et al. (2023) investigated the relationship between prudential regulation and banking risk in the West African Economic and Monetary Union, contingent on institutional quality. Using panel data from 63 banks from 2006 to 2019, they found that stringent banking regulations and supervision enhance banks' stability. Capital regulations, activity restrictions, and supervisory authorities reduce the risk of bank insolvency. The results suggest that a favorable institutional climate promotes rigorous enforcement of regulatory standards and robust supervision, thereby amplifying their efficacy.

Economic and institutional settings shape financial soundness. Strong institutions protect investors and promote prudent bank risk-taking. Uddin et al. (2020) provided evidence that improving government effectiveness, controlling corruption, and adhering to the rule of law reduces banks' risk exposure and improves stability in

emerging countries. According to La Porta et al. (1998), weak legal systems and governance can increase instability due to corruption, poor enforcement, and inefficient governments. High institutional quality offers better creditor protection against expropriation and supports financial market development (La Porta et al., 1997).

Demirgüç-Kunt and Detragiache (1998) found that weaker institutions increase the odds of financial fragility, while Nasreen et al. discovered that economic growth and institutional quality are positively associated with financial development. Institutional development affects the effectiveness of regulations. Klomp and de-Haan (2014) found that liquidity rules and activity limits reduce bank risk only with high institutional quality, using data from 60 countries from 2002 to 2008. Other studies show that institutional reforms strengthening legal systems, banking, and governance substantially improve stability by lowering portfolio risks (Fang et al., 2014).

Empirical evidence indicates that tight monetary policy and strict institutional quality regulations may not effectively reduce risks and may even negatively affect banking stability (Danisman & Demirel, 2019; Danisman & Tarazi, 2020). In certain cases, stringent controls can foster corruption and impair banking efficiency. Research suggests that regulatory limits do not always guarantee stability and may even trigger financial disruptions. The subprime crisis exemplifies the drawbacks and limits of banking regulation, highlighting regulatory loopholes that fail to restrain banks from imposing burdens on society (Stiglitz, 2010). This underscores the necessity for empirical analysis of regulation to identify practices that can foster banking stability and effectiveness across various contexts.

METHODOLOGY

For our analysis, we extracted a dataset of six institutional quality (IQ) and three monetary policy (MP) variables. The IQ variables include voice and accountability index, political stability and absence of violence, rule of law index, effectiveness of government activities, corruption control index, regulatory quality while those of MP include monetary policy rate, loan-deposit ratio and broad money supply. The dataset used in estimating the banking system fragility index BSFI) are those of private sector credit, total deposit of the banking system and the total foreign liabilities of the system. All these data were sourced from the Annual Statistical Bulletin of the Central Bank of Nigeria. The study covered a 22-year period (2000 to 2022).

Research Models

Our models are two-pronged: the general model for the relationship between banking system fragility and institutional quality and the model for estimating banking system stability itself. First we express the functional relationship between institutional quality and monetary policy and bank fragility as follows:

BSFI = f (INSQ, MPL)

INSTIQ = f (ACTI, PSAV, RLAW, GOVT, COCC, REGU) ….. (i)

MPL = f (MNPR, LODR, M2) …… (ii)

Where:

BSFI = Banking system fragility index

INSTIQ = Institutional quality

MPL = Monetary policy

The general model is expressed in its econometric form thus:

$BSFI = \Theta + \mho_1 VOAI + \mho_2 PSAV + \mho_3 RLAW + \mho_4 GOVT + \mho_5 COCI + \mho_6 REGU + \mho_7 MNPR + \mho_8 LODR + \mho_9 LOGM2 + \varepsilon$ …… (iii)

VOAI = Voice and Accountability index

PSAV = Political stability and absence of violence

RLAW = Rule of law index

GOVT = Effectiveness of government activities

COCI = Corruption control index

REGU = Regulatory quality

MNPR = Monetary policy rate

LODR = Loan-deposit ratio

LOGM2 = Logarithm of broad money supply

Θ = Constant

$\mho_1 \ldots \mho_9$ = Regression coefficients

ε = Stochastic error term.

The second model for estimating the BSFI is a modification of the one used by Kibritcioglu (2003) and Kayode and Oluwole (2023) and it is expressed as:

$$BSFI_t = \frac{\left[\frac{PSC_t - \mu PSC}{\delta PSC}\right] + \left[\frac{DPO_t - \mu DPO}{\delta DPO}\right] + \left[\frac{TFL_t - \mu TFL}{\delta TFL}\right]}{3} \quad \ldots\ldots\ldots\ldots \text{(iv)}$$

Where:

BSFI = Fragility index

PSC = Total private sector credit (domestic)

DPO = Banking system deposit (aggregate)

TFL = Foreign liabilities (aggregate)

t = time

μ = mean

δ = standard deviation

It is however important to note that banking system fragility depends on variations over time, there is need to measure all the variables in equation (iv) in terms of the variations between the present and past years. therefore, each of variables are estimated as follows:

$$PSC_t = \frac{(PSC_t - PSC_{t-1})}{PSC_{t-1}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(iv)}$$

$$DPO_t = \frac{(DPO_t - DPO_{t-1})}{} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(vi)}$$

DPO_{t-1}

$TFL_t = \underline{(TFL_t - TFL_{t-1})}$ ……(vii)

TFL_{t-1}

The BSFI can take negative or positive values and while a negative BSFI depicts a fragile banking system, a positive BSFI reflects a stable banking system. The more the negative a BSFI, the greater the fragility of the banking system and the more positive the BSFI, the more its stability. (Kayode & Oluwole, 2023)

Analytical Techniques

We used the Autoregressive Distributed Lag (ARDL) technique to determine the short and long run effect of IQ and MP variables on the fragility of the Nigerian banking system. According to Harris and Sollis (2003), the ARDL is highly reliable in that it produces unbiased long-run estimates especially in small sample or observations situations. To be favourable, the selected IQ and MP variables should improve the stability of the banks. This implies that these variables should increase as the fragility index increases (or fragility reduces). For this study, the ARDL model for estimating the long-run effect is specified as:

$BSFI_t = \alpha_{01} + \triangle^p_{i=I}\Theta_1 VOAI_{t-1} + \triangle^p_{i=I}\Theta_2 PSAV_{t-1} + \triangle^p_{i=I}\Theta_3 RLAW_{t-1} + \triangle^p_{i=I}\Theta_4 GOVT_{t-1} + \triangle^p_{i=I}\Theta_5 COCI_{t-1} + \triangle^p_{i=I}\Theta_6 REGU_{t-1} + \triangle^p_{i=I}\Theta_7 MNPR_{t-1} + \triangle^p_{i=I}\Theta_8 LODR_{t-1} + \triangle^p_{i=I}\Theta_8 LOGM2_{t-1} + e_t$ .....(viii).

Where: Θ_1 …. Θ_8 = Coefficients of the model variables. and e = stochastic error term.

However, the short run model incorporates the convergence dynamics and the error correction term in its estimates. The following model describes the short run dynamic relationship (error correction mechanism – ARDL) between the dependent and explanatory variables.

$BSFI_t = \alpha_0 + \triangle^p_{i=I}\lambda_1\beta VOAI_{t-1} + \triangle^p_{i=I}\lambda_2\beta PSAV_{t-1} + \triangle^p_{i=I}\lambda_3\beta RLAW_{t-1} + \triangle^p_{i=I}\lambda_4\beta GOVT_{t-1} + \triangle^p_{i=I}\lambda_5\beta COCI_{t-1} + \triangle^p_{i=I}\lambda_6\beta REGU_{t-1} + \triangle^p_{i=I}\lambda_7\beta MNPR_{t-1} + \triangle^p_{i=I}\lambda_8\beta LOGM2_{t-1} + \triangle ECT_{it}(-1) + \mu_t$ ..... (ix)

Where β = short run dynamics convergence coefficient,

$\triangle$ = differencing operator

ECT_t = Error correction term

ECT (-1) = speed of adjustment to equilibrium on the long run.

DATA ANALYSIS AND DISCUSSIONS

Preliminary Diagnosis of Research variables

This section contains the results of selected diagnostic tests to ascertain the statistical properties and the relationship between the dependent and explanatory variables.

Descriptive Statistics

Table 1 contains the descriptive statistics of each of the variables.

Table 1: Descriptive Statistics

	BSFI	VOAI	RLAW	PSAV	REGU	GOVT	COCI	MNPR	LODR	LOGM2
Mean	-0.219109	-0.617213	-1.106685	-1.902988	-0.907727	-1.05290	-0.96952	12.6363	64.9764	3.996762
Median	-0.554850	-0.637134	-1.068224	-1.925000	-0.905000	-1.037562	-1.123626	14.0000	62.3125	4.114125

Maximum	1.421400	-0.319363	-0.842660	-1.455326	-0.380000	-0.900000	1.100000	18.0000	96.8170	4.714009
Minimum	-1.077400	-0.868943	-1.512510	-2.211123	-1.290000	-1.210000	-1.502068	6.00000	37.5594	2.943721
Std. Dev.	0.731733	0.162579	0.196503	0.190857	0.205146	0.092889	0.684233	2.95776	15.0032	0.512249
Skewness	0.898295	0.386197	-0.752802	0.549917	0.283322	-0.184059	2.626875	-0.70145	0.20778	-0.537097
Kurtosis	2.541772	2.139946	2.714906	2.676649	3.559229	1.932882	8.393411	3.23683	2.58868	2.137772
Jarque-Bera	3.151236	1.224928	2.152446	1.204673	0.581005	1.168065	51.96654	1.85556	0.31339	1.739217
Probability	0.206880	0.542014	0.340881	0.547531	0.747888	0.557645	0.000000	0.39543	0.85496	0.419116
Sum	-4.820400	-13.57868	-24.34706	-41.86574	-19.97000	-23.16383	-21.32952	278.000	1429.48	87.92876
Sum Sq. De	11.24409	0.555072	0.810880	0.764953	0.883786	0.181197	9.831680	183.715	4727.04	5.510386
Observations	22	22	22	22	22	22	22	22	22	22

Source: Author (2024).

From Table 1, BSFI, VOAI, RLAW, PSAV, REGU, GOVT, COCI, MNPR, LODR and LOGM2 have mean values of -0.219109, -0.617213, -1.106685, -1.902988, -0.907727, -1.05290, -0.96952, 12.6363, 64.9764 AND 3.996762 respectively. BSFI, VOAI, PSAV, REGU, COCI and LODR are all skewed positively to the right of the mean (>0) while RLAW, GOVT, MNPR and LOGM2 are all skewed negatively to the left of the mean (<0). With respect to their kurtoses, BSFI, RLAW, PSAV, MNPR and LODR are all mesokurtic (approximately 3), hovering around the mean. However, VOAI, GOVT and LOGM2 are platykurtic (below 3) while REGU and COCI are leptokurtic, hovering above 3. According to the Jarque-Bera statistics and their probabilities, all the variables except COCI are normally distributed (p>0.05).

Correlations

The Pearson's correlations measure the degree of co-movement among research variables. in most cases, the emphasis is on the correlation between the dependent and explanatory variables. Table 4 shows the Pearson's correlation coefficients of the dependent with the independent variables.

Table 2: Pearson's Correlation Matrix

	BSFI	VOAI	RLAW	PSAV	REGU	GOVT	COCI	MNPR	LODR	LOGM2
BSFI	1									
VOAI	-0.369030	1								
RLAW	-0.249118	0.516877	1							
PSAV	0.239926	0.017264	-0.44344	1						
REGU	0.296116	-0.027010	0.18216	-0.146366	1					
GOVT	0.301551	-0.211123	-0.51330	0.532961	-0.112578	1				
COCI	-0.211144	0.011941	0.47858	0.069254	-0.228184	-0.099697	1			
MNPR	-0.371063	0.408819	-0.09757	0.429677	-0.421967	0.134475	0.012135	1		
LODR	0.558154	-0.010093	0.06209	-0.016483	-0.209372	0.072830	-0.012222	-0.266777	1	
LOGM2	-0.585253	0.397921	0.82608	-0.545245	-0.087075	-0.617800	0.515696	-0.012909	-0.14291	1

Source: Author (2024).

Table 2 reveals that VOAI, RLAW, COCI, MNPR and LOGM2 have negative correlation with BSFI such that as BSFI increases, these variables move in the opposite direction by as much as 0.369030 (37%), 0.249118 (25%), 0.211144 (21%), 0.371063 (37%) and 0.585253 (59%) respectively. However, PSAV, REGU, GOVT and LODR have positive correlation with BSFI such that as BSFI rises, the variables move in the same direction by as much as 0.239926 (24%), 0.296116 (30%), 0.301551 (30%) and 0.558154 (56%) respectively.

UNIT ROOT TEST RESULTS

All the model variables were tested for the absence of unit root or stationarity. Table 3 summarizes the results of the ADF stationarity test.

Table 3: Stationarity Tests Results

Variable	At Level (5%)		At 1ST DIFF (5%)		DECISION
	ADF Stat	Prob	ADF Stat	Prob	
BSFI	-2.998087	0.0514	-4.711151	0.0015	I (I)
VOAI	-1.443605	0.5404	-4.175343	0.0049	I (I)
RLAW	-1.883376	0.3327	-4.146379	0.0052	I (I)
PSAV	-2.727729	0.0869	-4.974367	0.0010	I (I)
REGU	-2.268140	0.1908	-6.043977	0.0001	I (I)
GOVT	-2.756662	0.0824	-6.549243	0.0000	I (I)
COCI	-0.286850	0.9109	-4.248361	0.0042	I (I)
MNPR	-2.391107	0.1554	-7.214744	0.0000	I (I)
LODR	-3.663053	0.0142	-	-	I (0)
LOGM2	-2.629102	0.1024	-3.591422	0.0152	I (I)

Source: Author (2024).

All the variables except LODR (which is stationary at level) become stationary at first difference (p<0.05 at I(I). For LODR, the stationarity is at I (0), that is at level. Since the variables are stationary, a test of co-integration is carried out to ascertain that there exists long-run relationship between BSFI and the other variables.

ARDL Bound Test

Table 4 is the abridged result of the ARDL Bound co-integration test conducted.

Table 4: (ARDL Bound) Long run Relationship Test Result

Null Hypothesis = No Co-integration		
Test Statistic	Value	k
F-statistic	3.670335	9

Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	1.88	2.99
5%	2.14	3.3
2.5%	2.37	3.6
1%	2.65	3.97

Source: Author (2024).

The critical values for upper and lower bounds at 0.05 or 5% LOS are 2.14 and 3.3 respectively while the calculated F-Statistic is 3.670335. Since the latter is greater than both critical values, it implies that a long run relationship exists between BSFI and the explanatory variables.

Effect of Institutional Quality and Monetary Policy on Banking System Fragility

We used the ARDL short run (SR) error correction mechanism – ECM and long run (LR) models to estimate the effect of IQ and MP variables on BSFI. Table 5 summarizes the results of both models.

Table 5: ARDL SR (ECM) and LR Model Estimates

	Method = ARDL. Dependent Variable = BSFI						
Variable	Short-run Effect				Long-run Effect		
	Coeff.	Prob.	Decision		Coeff.	Prob.	Decision
D(VOAI)	-2.157130	0.0400*	Significant	VOAI	-3.991441	0.1461	Insignificant
D(RLAW)	1.302489	0.2143	Insignificant	RLAW	2.410058	0.2781	Insignificant
D(REGU)	0.581842	0.5170	Insignificant	REGU	1.076610	0.5467	Insignificant
D(PSAV)	0.010241	0.9882	Insignificant	PSAV	0.018949	0.9881	Insignificant
D(COCI)	-0.182174	0.5351	Insignificant	COCI	-0.337085	0.5717	Insignificant
D(GOVT)	1.987219	0.2871	Insignificant	GOVT	3.677046	0.4131	Insignificant
D(LODR)	0.024806	0.0047*	Significant	LODR	0.045900	0.0560	Insignificant
D(MNPR)	0.058179	0.2996	Insignificant	MNPR	0.107650	0.4171	Insignificant
DLOG(M2)	0.000002	0.9377	Insignificant	LOGM2	0.000003	0.9386	Insignificant
CointEq(-1)	-0.540439	0.0327	-	C	-2.297064	0.9158	-
R^2	0.847416						
Adjusted R^2	0.694833						

DW Stat	2.215172	
F-Stat	5.553783	
Prob (F-Stat)	0.006071	

Source: Author (2024).

On the effect of IQ on BSFI, in the SR, the ECM results show that VOAI has a negative and significant effect on BSFI (coefficient = -2.157130, p = 0.0400<0.05). This implies that as VOAI increased, BSFI reduced during the period. Furthermore, although the other variables affect BSFI in different ways (RLAW = 1.302489; REGU = 0.581842; PSAV = 0.010241; COCI = -0.182174 and GOVT = 1.987219), none of these effects is statistically significant in the SR.

On the effect of MP on BSFI, LODR has a positive and significant effect on BSFI (coefficient = 0.024806, p = 0.0047<0.05) so that as LODR increased, the BSFI also increased. However, the positive effect of MNPR and LOGM2 (coefficients 0.058179 and 0.000002 respectively) are not significant. Nevertheless, the ECM reveals that about -0.540439 (54%) of deviations from equilibrium in the previous period is corrected back in the present year.

With respect to the effect of IQ on BSFI on the LR, VOAI and COCI have negative effect on BSFI (-3.991441 and -0.337085 respectively) but the effect is not significant. RLAW, REGU, PSAV and GOVT all have positive but insignificant effect on BSFI (coefficients 2.410058, 1.076610, 0.018949 and 3.677046 respectively).

On the effect of MP on BSFI, surprisingly on the LR, none of the variables have significant effect on BSFI although they are positive (coefficients 0.045900, 0.107650 and 0.000003 respectively for LODR, MNPR and LOGM@ respectively).

The adjusted R^2 of 0.694833 connotes that not less than 69% of the variations in BSFI are explained by both IQ and MP variables while the other 31% are explained by other variables not captured in the research model. The Durbin-Watson (DW) Statistic of 2.215172 means that no serial correlation problem exists among the variables. in addition, given the F-Statistic (5.553783) and its probability (0.006071<0.05), the research model is reliable.

Post-estimation Tests Results

Three post-estimation tests were conducted to confirm the robustness of the research model and results, including the Jarque-Bera residual normality test, the Breach-Pagan (LM) serial correlation test and the test of residual heteroscedasticity.

Table 6 is the summary of the post-estimation tests.

Table 6: Results of Post-estimation Tests

Test	Statistics	P-Value	Conclusion
Jarque-Bera Residual normality	0.745056	0.688991	Normally distributed
Breusch-Godfrey Serial Correlation LM Test	1.250075	0.3370	No serial correlation
Heteroskedasticity Test: Breusch-Pagan-Godfrey	1.104852	0.4389	Heteroskedastic

Source: Author (2024).

The J-B Statistics (0.745056) and its corresponding probability (0.688991>0.05) imply that the model residual is normally distributed. Furthermore, there is no serial correlation of residuals and it is heteroscedastic given

their F-Statistics and probabilities (1.250075 and 0.3370>0.05) and (1.104852 and 0.4389) respectively. The null hypotheses in all of these tests are rejected.

Discussion

This study broadly examined the effect of two key areas that determine the thrust of the country's economy: institutional quality and monetary policy on the fragility or stability of the banking system. The effects of the IQ and MP variables are examined from two perspectives: short and long runs. The discussion here is done from four perspectives.

Short-run Effects of IQ Variables on Banking System Fragility in Nigeria

The effect of five IQ variables were examined. The variables include voice and accountability index (VOAI), rule of law (RLAW), regulatory quality (REGU), political stability and absence of violence (PSAV), corruption control index (COCI) and government effectiveness (GOVT).

Of these five IQ indices, only the negative effect of VOAI is significant. The voice and accountability index measures a country's level of democratic governance, citizen participation, and government transparency. A negative but significant effect on bank fragility index could be due to the presence of less effective regulation: Typically, stronger democratic institutions and citizen participation may lead to more stringent regulations, which could increase banks' operational costs and reduce their flexibility, making them more fragile. Also, with relative increase in policy instability, constantly changing policies may create uncertainty and instability in the banking sector. It has also been argued that enhanced scrutiny and transparency may expose existing vulnerabilities in the banking system, leading to a perceived increase in fragility.

Also, sudden increases in transparency and accountability may disrupt cozy relationships between banks and regulators, leading to a short-term increase in fragility. This is apart from the fact that in the short-term, banks may need to invest in compliance and reporting systems, diverting resources from other areas, and potentially weakening their stability.

The effects of the remaining five IQ variables are insignificant yet deserve some comments. Apart from COCI, all the others (RLAW, REGU, PSAV and GOVT) have positive effect on BSFI. Generally, it is possible that IQ variables may not have a significant effect on banking system fragility because a situation of institutional inertia is possible. Existing power structures and relationships between banks, regulators, and governments may resist changes, limiting the impact of improved institutional quality. In addition, institutional quality variables may only address specific aspects of banking regulation, leaving other vulnerabilities unaddressed.

Short-run Effects of MP Variables on Banking System Fragility in Nigeria

Among the three MP variables examined, the loan-deposit ratio (LDR) is the only one that positively and significantly affects banking fragility index in the short-run. This implies that the LDR during the study period improved (reduced) banking system stability (fragility). First, a higher LDR may reduce bank fragility and improve its stability in the short run due to reduced credit risk, occasioned by investment in high performing loan portfolios. This leads to increased liquidity resulting from increased interest earnings and effective loan management. Additionally, increased LDR means more funds are available for productive investments in the economy. Productive investments also directly and indirectly contribute to banking system stability.

The remaining MPR variables (MNPR and LOGM2) have no significant effect on banking system fragility index in the short run, though the effect was positive. This is explainable as monetary policy may not effectively reach all segments of the banking system, especially in countries with underdeveloped financial markets with limited transmission mechanisms. Monetary policy changes may have offsetting effects on bank fragility, such as stimulating credit growth but may also increase inflation. Again, such changes may take time to affect banking system stability and fragility, making it difficult to establish a clear link. It is even possible for banks not to respond as expected to monetary policy changes, potentially due to factors like risk aversion or liquidity constraints. When they respond, they may find ways to circumvent monetary policy restrictions, reducing its

impact on non-fragility. In addition, monetary policy may be less effective in certain macroeconomic environments in the SR, such as during recessions or periods of high inflation.

Long-run Effects of IQ Variables on Banking System Fragility in Nigeria

On the LR, voice and accountability and corruption control indices have negative effect while rule of law, political stability and absence of violence, government effectiveness and regulatory quality have positive effect, but none of these IQ indicators have significant effect on the fragility index of the banks during the period. This scenario calls for concern. Some factors can contribute to the phenomenon where institutional quality indicators, despite some having a positive relationship with banking system fragility index, exhibit an insignificant effect in the long run.

IQ indicators might be imperfectly measured or not adequately capturing the true state of institutional quality. If the indicators used do not accurately reflect the quality of institutions, the observed impact on banking system stability could be attenuated, resulting in insignificant effects. Also, **i**mprovements in IQ may take a long time to manifest in banking system stability. Institutional reforms and enhancements often require substantial time to be implemented and for their benefits to be fully realized. During this transitional period, the positive effects might not yet be evident. Added to this is that **t**he banking system can be heavily influenced by external shocks such as global financial crises, economic downturns, or geopolitical events. These external factors can overshadow the positive effects of improved institutional quality, rendering the long-term impact insignificant.

Importantly, macroeconomic factors, such as inflation rates, unemployment, and economic growth, might have more immediate and pronounced effects on banking system stability. These factors can confound the relationship between IQ and banking stability, making the latter's effect appear insignificant. In Nigeria also, **t**he regulatory and policy environment in which banks operate is weak, which can significantly influence banking stability. If regulatory policies are weak or inconsistent, they can undermine the positive effects of good institutional quality on banking stability.

Moreover, the Nigerian banking system is highly oligopolistic, hence, **t**he structure of the banking sector, including the presence of too-big-to-fail institutions, competition levels, and the dominance of certain types of banks, can impact how institutional quality affects stability. A highly concentrated banking sector might not respond to institutional improvements in the same way as a more competitive one.

Long-run Effects of MP Variables on Banking System Fragility in Nigeria

None of the three MP variables have significant effect on banking system fragility index on the long run. The reasons for this are not far from those spelt out in section 4.5.2 with respect to MP having insignificant effect on BSFI in the short run. These range from transmission mechanism delays global economic conditions and external shocks, adaptive behaviour of banks, macroeconomic variables such as inflation, unemployment, and economic growth, weak regulatory framework, underdeveloped financial system, market credibility to **t**he rapid pace of financial innovation and the increasing complexity of financial products, among other reasons.

CONCLUSION AND RECOMMENDATIONS

This study was conceived to address two major questions: How do IQ indices affect banking system fragility in the short and long runs and how do monetary policy tools affect it in the short and long runs? Based on our findings, four conclusions are reached:

First, we conclude that in the short run, an IQ index, voice and accountability index significantly contributed to the fragility of the Nigerian banking system during the research period. Second, we also conclude that a monetary policy variable, loan-deposit ratio, significantly reduced banking system fragility because of the positive effect it had on the BSFI in the short run. Third, IQ indicators have no significant effect on BSFI on the long run, although some of them have positive effect. Finally, monetary policy variables did not significantly affect the BSFI on the long run.

Given the aforementioned conclusions, we recommend a focused approach on institutional reforms. Such approach can include enhancing regulatory frameworks, improving governance standards, and increasing transparency and accountability in financial institutions. For instance, strengthening anti-corruption measures and ensuring strict enforcement of laws can mitigate negative effects. Periodic assessments and adjustments of these reforms should be conducted to ensure they are effective and adaptive to new challenges. In addition, we advocate capacity building, improvement of institutional coordination, and ensuring that policies are not only well-designed but also effectively implemented. Furthermore, we also **opine that** it is crucial that regulatory authorities (particularly the CBN and the Nigerian Deposit Insurance Commission) to continuously fine-tune monetary policies to adapt to changing economic conditions. The CBN should regularly review the effectiveness of their policies, using data-driven approaches to make necessary adjustments. A pragmatic evaluation of existing monetary policies to assess why they are not impactful should be done so that necessary innovative approaches to enhance their effectiveness can be developed.

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