BANK-INHERENT RISKS AND PERFORMANCE IN NIGERIA'S RECESSION ERA: EVALUATING THE EFFICACY OF RISK-BASED SUPERVISION (2012-2019)

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Abstract

Nigerian banking sector have been reportedly challenged with deteriorating performance due to problems of lax enforcement of compliance and failure to identify operational vulnerabilities by the apex regulating bodies operating in the sector. To curtail the prevailing challenges, Risk-Based Supervision (RBS) was adopted in order to ensure sufficient oversight and effective risk management practices most especially in a crisis era. This study aimed to evaluate the efficacy of RBS in strengthening the relationship between Bank-inherent risks and performance before and during the period of 2016 recession era in Nigeria. The study applied panel data regression model to estimate the interacting effect of RBS, bank-inherent risks (credit risk, liquidity risk, operational risk, solvency risk, capital adequacy risk, market risk and foreign exchange risk) and banks' performance (ROA). Secondary data obtained from the annual financial statements of the firms for the periods of 2012-2019 were used in the analysis. The study found insignificant positive interacting effects of RBS and credit risk, liquidity risk, operational risk, and market risks on banks performance during the recession periods in Nigeria. However, negative and insignificant interacting effect of RBS in the relationship between solvency risk and capital adequacy risk on banks' performance were documented. It was also concluded that RBS has a varied influence in the relationship between firms' risk and performance of financial service firms in Nigeria in the recession periods. It was recommended the CBN should ensure that the RBS core principle of evaluation of control, management and governance are applied at both business and enterprise-wide levels so as to ensure sound banking operation in any crisis rea.

Keywords: *Bank-Inherent Risks, Risk-Based Supervision, Recession, Performance*

Background of the Study

Financial service sector is widely regarded as the backbone of a nation's economy, with its success deeply rooted in public trust and confidence. When financial firms underperform, they risk losing stakeholder trust, which can destabilize the entire system. Moreover, ineffective risk management in critical areas may push the sector toward a financial crisis (BCBS, 2015). A key determinant of global financial performance is the sector's ability to fulfil its intermediation role efficiently thereby connecting savers with borrowers. A crucial aspect of

financial sector performance globally is the ability of financial firms to efficiently offer greater avenue for corporate entities and individuals to raise funds for the attainment of strategic business objectives (Melecky, et al., 2020).

In Nigeria, the financial sector where banks operate, faces key vulnerabilities originating out of weak financial regulation and supervision. The apex regulators [Central Bank of Nigeria (CBN), and Nigeria Deposit Insurance Corporation (NDIC)] were challenged for lax enforcement of compliance and failure to identify operational vulnerabilities that may jeopardize the stability of firms operating within the sector. These weaknesses became obvious during the 2016 recession, as banking institutions were highly exposed to the distressed oil and power sectors; and excessive government borrowing occasioned by fiscal instability and rising debt servicing (Okodugha, 2021). These systemic challenges led to poor performance among banks which threatened the sector-wide safety and stability.

In response to these grave challenges, the CBN strengthen the adoption of Risk-Based Supervision (RBS) to so as to ensure sufficient oversight and effective risk management practices within the sector. The framework was envisioned to addressing poor risk practices and enhance overall performance in the sector (CBN, 2019). The policy guideline establishing the RBS approach provided accurate direction for financial institutions to develop a sound risk management framework in a consolidated or firmwide bases (CBN, 2011). Moreover, as the RBS approach has a proper mixture of both the off-site monitoring and on-site examination, it also recognizes the acceptance that risk can originate out of a number of sources, and takes in to cognizance all relevant information that have risk bearing can arise both from within and outside a firm (CBN, 2014). When it comes to risk measurements, the approach takes into account the combined effect of credit risks, liquidity risks, operational risk, solvency risk, capital adequacy risk, market risks, among others, which have direct or indirect bearing with the firm's operations (CBN, 2014).

Although, implementation and well-functioning of RBS approach in institutions is supported with proper deployment of effective risk management practices, past studies have theoretically established the existence of relationship between risk management practices and performance (Dugguh & Diggi, 2015; Gathigia Muriithi, 2016; Harelimana, 2017), with sound theoretical antecedents. From the empirical literature point of view, the relationship between firms' risk determinants and the performance of financial service firms remains inconclusive, as existing literature presents mixed findings. While some studies (Ogundajo et al., 2020; Boukaira and Hakimi, 2020) highlight a positive effect of risk constructs on performance, others ((Al-eitan & Bani-khalid, 2019; Chen et al., 2018) reported negative impacts. These inconsistencies cast doubt on the projected effect of risk constructs in driving performance. Consequently, additional empirical investigations are required to clarify the nature of this relationship. Hence, scholars such as Wu and Zumbo (2008), suggest the introduction of moderating variables when contradictions arise between dependent and independent variables, emphasizing the need for deeper analytical approaches in future research.

Furthermore, scholarly evidences from past studies on risk management practices have revealed that financial regulations and stakeholders demand were empirically tested to be the key drivers of firms' risk management practices (Noman et al., 2018; Rachdi & Ben Bouheni, 2016). Though, empirical evidences from other developing economies have revealed that RBS implementation reduced NPLs by 32% in South Africa (SARB, 2017) and 28% in Kenya (CBK, 2019) through targeted risk assessments. However, the laxed adoption in the Nigerian

financial sector saw non-performing loans (NPLs) peak at 14.6% pre-RBS (CBN, 2018). Adding to that, Morocco achieved a 40% NPL decline post-RBS (Bank Al-Maghrib, 2020), while Ghana's phased implementation yielded 25% improvement (BoG, 2021). These findings suggest RBS efficacy correlates with early adoption, sector-specific risk weights, and supervisory capacity, thus, highlighting Africa's divergent experiences with Basel III-aligned supervision.

Thus, in compliance with the regulatory RBS provision that each firm should have risk management committee responsible for strengthening their activities towards achieving the best risk managements practices for performance improvement (BCBS, 2012), a comprehensive understanding of the effect of RBS, firms' risk and performance of financial service firms require additional study with a wider scope of coverage. Thus, association of RBS and firms' inherent risk indicators (such as credit risk, liquidity risks, capital adequacy, solvency, operational, market, and foreign exchange risks) and their implications on the performance of banks need to be studied in a single hypothetical model. This is necessary due to the fact that less attempts were given by past studies to explore the gap existing on the efficacy of RBS in regulating the relationship between firms' risk and performance outcome, most especially in consideration of the period of unstable economic environment where systematic uncertainties are likely to jeopardize banks' operations in high magnitude. Hence, this study is set out to explore the efficacy of Risk-Based Supervision on the relationship between bank-inherent risks and performance in Nigeria, taking into consideration, the 2012-2019 recession era. The study raised seven hypotheses on the interactions of RBS, firms' inherent risks measured by credit risks, liquidity risks, operational risks, solvency risks, capital adequacy risks, market risks, and foreign exchange risks; and banks' performance measured by ROA.

The remaining aspects of this paper is organized as follows: section two offered review of relevant literature related to firms' performance, firms' risks, and RBS. This was proceeded by the presentation of the theoretical framework underpinning the study. Section three presents the methodology used in the study; while section four the presents the results and the discussions of findings. Section five presents the conclusion, recommendation, and limitation of the study; as well as suggestion for future study.

Concept of Performance

Conceptualization of firms' performance has undergone significant theoretical and methodological transformation in recent years. The concept was initially conceptualized as a multidimensional construct with distinct disciplinary interpretations. Economist placed greater emphasis on wealth distribution (Simpson, 2007), management scientists were more concerned on firm profitability (Modell, 2001), while financial analyst directed their concern toward ensuring resource efficiency in financial decisions (Bae et al., 2008). Moreover, contemporary scholars are continuously advancing a more integrated, dynamic paradigm (Adawiyah, 2024) toward performance metrics. This evolution reflects both conceptual synthesis across disciplines and methodological innovation.

In the areas of performance measurement analysis, traditional assessment heavenly relied on static financial ratios (ROA, ROE) and standardized frameworks like CAMELS (Aspal & Dhawan, 2016), while modern performance ecosystems incorporate Environmental, Social,

and Governance (ESG) metrics, advanced analytics, and predictive modelling techniques (Rane et al., 2024). Similarly, performance metrics assessment has equally progressed from retrospective (ex post) evaluations of operational efficiency, to real-time monitoring systems that integrate economic value added (EVA), digital transformation indicators, and stakeholder value creation metrics (Zhang, 2024). This paradigm shift mirrors broader trends in finance discipline that increasingly emphasize the interdependence of financial performance, sustainability outcomes, and technological capability in organizational assessment frameworks.

Similarly, firms' financial performance indicators have largely been shaped by an interplay of internal governance factors and external macroeconomic conditions. Internally, the CAMELS framework remains foundational particularly in banking supervision, where metrics like capital adequacy (Basel III CET1 ratios) and asset quality (NPL coverage) interact with emerging digital efficiency indicators such as API transaction success rates (Kosztowniak, 2022). Externally, recent studies have demonstrated how macroeconomic shocks (such as pandemic-related GDP contractions) disproportionately affect emerging market banks compared to their developed market counterparts, with inflation hedging strategies becoming critical performance differentiators (IMF, 2023: Martins, 2024).

Concept of Risk

Risk has emerged as a conceptually rich construct in firms' analysis, simultaneously representing both potential threats and strategic opportunities (Bromiley et al., 2021). The scholarly conceptualization of risk has evolved significantly from early deficit-based perspectives that emphasized pure loss potential (Shelley, 2017) to contemporary dual-aspect frameworks that recognize its capacity to create value (Andersen et al., 2013). This conceptual expansion reflects key developments, including the recognition of risk as fundamental exposure to uncertainty rather than mere probability (Faulkner, et al., 2022); to its operationalization as deviation from expected outcomes (Dowd, 1999); and its context-dependent manifestation across organizational domains. Similarly, sector-specific analyses reveal the existing risk perceived duality approach where fintech enterprises leverage risk for innovation (Palmieri & Geretto, 2024), while banking institutions focus on risk mitigation through Basel frameworks (BCBS, 2021); hence the foundation of risk-based supervision approach to financial firms.

Thus, this study advances an operational definition of risk as the firms' relative exposure to uncertain events that simultaneously threaten stability and enable strategic transformation, thereby necessitating integrated evaluation of both resilience capacities and opportunity landscapes in managerial decision-making.

Bank-Inherent Risks

Banks-inherent risks are categorized into different components which can result from either firm specific, sector-wide (macroprudential) and economic-wide (macroeconomic). According to CBN (2014), risk can be categorised into and not limited to credit risk, liquidity risk, operational risk, solvency risk, capital adequacy risk market risk, foreign exchange risk, market

risk, reputation, and political risk. These risks components emanate as a result of uncertainty resulting out of the firms the overall operation or from external forces.

Thus, credit risk, referred to as default risk, portfolio risk, or transaction risk according to Spuch, Valašková and Adamko (2015) can be seen as the risks arising due to inability of a counterpart to meet his contractual commitments. Li (2016) considered liquidity as the inability of a firm to realize value from asset either by using its creditworthiness to obtain external funding; or by the sale of owned assets in the marketplace without incurring severe losses. Similarly, CBN (2014) defined operational risk is the risk that stems out of failure of people, processes and technology which leads to severe damages. Ferrouhi (2014) defined solvency risks as the inability of a firm to meet its long-term expenses, and to attain long-term growth and expansion. Moreover, Glantz and Mun (2010) regarded capital adequacy risk as the inability of firm to hold enough amount of equity capital and other securities as reserves against risky assets, and as a hedge against the probability of failure. Market risk refers to the uncertainty caused by markets instabilities, indicating the possibility of a firm losing its earnings due to fluctuations in market price (Mirković, Dašić, & Siljković, 2013). Papaioannou (2006) defined foreign exchange risk as the potential loss resulting out of exchange rate fluctuation.

Review of empirical literature such as Boukaira and Hakimi (2020), Kinyua, (2017), Fadun and Oye (2020), Hamza (2017). Chen et al. (2018), Wani and Dar (2015), Pradhan and Pratikshya (2017), Dahiyat (2016), Muhlnickel et al. (2016), Nyawir, Ambrose and Ndede (2017), Imane (2015), Ogungbade and Idode (2016), and Raza, Ali, and Ali (2017) among others, have revealed the existence of relationship between those inherent risks and banks' performance Foreign exchange risk

Concept of Risk-based supervision

Risk-Based Supervision (RBS) has been conceptualized as a multi-dimensional approach to financial oversight. According to Randle (2009), RBS is defined as a supervisory framework that systematically evaluates both firm-level and systemic risk management processes, enabling regulators to identify critical risk concentrations and allocate supervisory resources accordingly. Building on this, Nidhiprabha and Nidhiprabha (2018) developed a more structured framework, covering the core components of RBS implementation: comprehensive risk exposure assessment, evaluation of organizational risk management capabilities, and analysis of potential financial vulnerabilities. Similarly, (CBN, 2011b) defined RBS as an approach by which supervisors develop and maintain forward-looking assessment of risk profile associated with individual firm and the group, the recognition of the risks exposed to the industry, and the allocation of more supervisory resources to such areas identified with higher risk.

Also established in the RBS approach, risks ascending from firm-specific bases need to be considered alongside with those arising from sector-wide (macroprudential) and the broader economy (macroeconomic) (BCBS, 2015b). When it comes to risk measurements, the approach takes into account the combined effect of credit risks, liquidity risks, operational risk, solvency risk, capital adequacy risk, market risks, among others, which have direct or indirect bearing with the firm's operations (CBN, 2014).

The adoption of Risk-Based Supervision (RBS) in banking sector marks a fundamental transformation in prudential oversight, replacing one-size-fits-all compliance approach. The Basel Committee's RBS framework (BCBS, 2012, 2023) provided three pillars of modern banking supervision which include risk-based capital requirements (CET1 ratios adjusted for business model risks); forward-looking liquidity monitoring (NSFR/LCR stress testing); and governance evaluations of risk culture (MAS, 2022; PRA, 2023). This paradigm shift has responded to the established failures of compliance-based supervision during the 2008 crisis, where strict compliance metrics resulted to accumulating systemic risks in banks (BIS, 2020). In emerging economies like Nigeria, RBS implementation through the Banking Sector Assessment Framework (CBN, 2011b, 2022) has enabled dynamic responses to digital banking risks and dollarization exposures, reducing non-performing loans by 12% in early-adopting banks (IMF, 2023).

Theoretical Underpinning

The theoretical underpinning of the interacting effect of the regulatory efficacy of RBS, bank-inherent risk and performance of banks in Nigeria, taking into consideration, the period of recession can be discussed under the theoretical foundation of Agency theory, Financial Instability Hypothesis, as well as the Basel Accords Framework and Risk-Weighted Asset Model.

Agency Theory

Agency theory framework (Jensen & Meckling, 1976) provides critical philosophical foundation for examining bank-inherent risks during Nigeria's recession era, most especially in evaluating the efficacy of risk-based supervision efficacy. The theory explains the inherent conflicts between bank managers (agents) and shareholders/depositors (principals), where information asymmetries and divergent risk appetites may incentivize excessive risk-taking, especially during economic contractions when pressure to maintain performance intensifies (Pathan, 2009).

In the Nigerian context, the 2016-2017 recession exacerbated the profound agency problems, as evidenced by increased non-performing loans (NPLs) reaching 14.6% of total credits (CBN, 2018), reflecting either managerial recklessness or supervisory failures. Risk-based supervision emerges as an institutional mechanism to mitigate these agency costs through enhanced transparency requirements thereby reducing information asymmetry; risk-sensitive capital buffers; and targeted supervisory interventions for high-risk institutions thereby controlling moral hazard (BCBS, 2015). The theory further clarifies the main idea why traditional compliance-based supervision proved inadequate during the crisis period, as it failed to address the dynamic risk-shifting behaviours projected by agency theory (Adegbite, 2020). It also highlighted how proper RBS implementation could have reduced the depth of Nigeria's banking sector contraction (estimated at 8.3% GDP impact) within the period of coverage (NBS, 2019).

Financial Instability Hypothesis

Financial Instability Hypothesis propounded by Minsky's (1992) provides a compelling theoretical lens for analysing bank-inherent risks during the period of recession in Nigeria, particularly in assessing the effectiveness of risk-based supervision. The hypothesis posits that

prolonged economic stability inherently breeds financial fragility as banks transition from hedge (prudent) to speculative (rollover-dependent) and ultimately Ponzi (debt-servicing incapable) financing postures, which an evident glaring in pre-recession credit boom in in the Nigeria, where bank lending grew at 28.4% annually (2010-2014) before collapsing to -5.1% by 2017 (CBN, 2018).

The theoretical framework of Financial Instability Hypothesis explains how Nigeria's banking sector exhibited classic Minskyian fragility markers: excessive margin lending (speculative finance), oil-sector collateral overexposure (Ponzi finance), and dividend payouts exceeding earnings (financialization) inadequately captured by traditional baking supervision (Sanusi, 2019). Risk-based supervision emerges as a potential countercyclical stabilizer under this hypothesis, with its emphasis on dynamic provisioning against cyclical risks (BCBS, 2017); stress testing for rollover risks (CBN, 2020); and sectoral concentration limits to curb euphoric lending, the measures that could have mitigated the 62% increase in NPLs during Nigeria's recession (IMF, 2018). The hypothesis further underscores why supervision must evolve beyond micro prudential stability to incorporate macroprudential indicators of system-wide maturity transformation risks, particularly in emerging markets vulnerable to commodity price shocks (Adekunle et al., 2021).

Basel Accords Framework and Risk-Weighted Asset Model

Basel Accords (II/III) framework (BCBS, 2011) offer a critical theoretical foundation for examining bank-inherent risks and performance during recession era, particularly through its risk-weighted asset (RWA) models and capital buffer mechanisms. The core premise of the framework established that banks must maintain capital adequacy proportional to their risk exposures. Similarly, the framework establishes three key theoretical pillars relevant to Nigeria's context which include: the risk-sensitive capital requirements (8% minimum CAR with countercyclical buffers); the enhanced risk coverage through standardized and advanced measurement approaches (including credit, market, and operational risks); and liquidity safeguards (LCR and NSFR) to mitigate maturity mismatch risks (BCBS, 2011, 2017).

During Nigeria's 2016-2017 recession, moreover, the theoretical effectiveness of the aforementioned mechanisms was tested, as RWA models theoretically should have flagged the accumulating risks in oil-sector exposures (constituting 25% of banking sector loans) and foreign currency mismatches (with $9.2bn open positions by 2015, CBN, 2016). Thus, the capital conservation buffer (2.5%) and countercyclical buffer provisions under Basel III (BCBS, 2017) were specifically designed for such downturn scenarios, aiming to ensure banks maintain loss-absorbing capacity when risk materializes.

However, the unjustified delayed of full implementation of Basel II/III in Nigeria created regulatory gaps that exacerbated the crisis impact, demonstrating how theoretical RWA models require rigorous supervisory enforcement to be effective, which serve as a core tenet of risk-based supervision that this study evaluates. The framework's emphasis on forward-looking provisioning (IFRS 9 adoption) and stress testing further highlights the synergy between Basel standards and effective risk-based supervision in crisis mitigation.

In summary, based on the foregoing theoretical discussion, Agency theory clarifies the main idea why traditional compliance-based supervision proved inadequate during the crisis period, Minsky's (1992) Financial Instability Hypothesis showcases how Nigeria's pre-recession credit boom (28.4% annual growth, 2010-2014) fostered banking sector fragility through speculative

lending and oil-sector overexposure, culminating in a -5.1% credit contraction by 2017 (CBN, 2018). Similarly, the review revealed the extent of the Basel II/III framework (BCBS, 2011) theoretically counters such risks via risk-weighted assets and capital buffers, giving the regulatory partial implementation (73% compliance by 2019) limiting the crisis efficacy in Nigeria. Hence, Risk-based supervision emerges as a critical stabilizer through dynamic provisioning and stress testing, potentially mitigating any possible exposure (such as credit risks, liquidity risks, operational risks, solvency risks, capital adequacy risks, market risks, and foreign exchange risks) that may affect firms' survival. Based on the aforementioned theoretical underpinnings, Together, these theories underscore the necessity of proactive, risk-sensitive oversight in the inherent risks' variable in Nigeria banks.

Review of Empirical

Empirical research demonstrates the transformative impact of RBS adoption across major financial jurisdictions, offering critical insights for Nigeria's banking supervision framework. The Arnould & Dehmej (2015) provided comprehensive assessment of 130 Eurozone banks which revealed that RBS implementation reduced default probabilities by 38% and NPL ratios from 6.8% to 4.2% within two years through enhanced risk identification, contrasting with Nigeria's 14.6% NPL peak under its pre 2016 compliance-based approach (CBN, 2017). Similarly, the U.S. Federal Reserve's (2019) CCAR program demonstrated RBS's crisis-prevention value, with stress-tested banks maintaining 18% higher capital buffers and avoiding $74 billion in potential losses during commodity shocks. Moreover, cross-jurisdictional analysis by Barth et al. (2020) further quantified RBS advantages, showing UK's PRA detected 82% of emerging risks pre-crisis compared to Nigeria's 31% identification rate, while Singapore's MAS (2021) reported 67% lower bank failures through risk-proportional supervision.

Additionally, Hossain et al. (2018) found that a 10% rise in CAR, Tier 1 ratio, and leverage ratio boosts bank resilience (Z-Score) by 2.18%, 0.89%, and 1.31% respectively. The study demonstrated that a 100% LCR increase enhances resilience by 0.51-1.19% across these capital measures, with CAR showing particular robustness. The results indicate that combining LCR and leverage ratio implementations proves most effective for strengthening bank stability. These findings underscore the importance of integrated capital and liquidity requirements in promoting financial resilience. Also, Heynderickx et al. (2016) analysed 257 European banking groups (2005-2014), revealing shifting capital drivers across crises. During the financial crisis, capital increases came primarily from share issuances and government recapitalizations. The sovereign debt crisis saw reduced RWA density (RWA/TA), while post-crisis adjustments featured significant income effects and asset shrinkage. Country and bank-level analyses demonstrated substantial heterogeneity in meeting regulatory requirements, highlighting diverse adaptation strategies to Basel III implementation across European banking systems.

Similarly, empirical studies have revealed the banking sector vulnerabilities in Nigeria during the 2016-2017 recession. For instance, Lenee & Sulaiman (2016) identified significant long-term relationships between capital adequacy and performance metrics in Nigerian banks and revealed that robust capital adequacy actively enhances bank performance in Nigeria; suggesting that well-capitalized institutions achieve greater asset growth and profitability in the period of recession. Hence, the study provides critical evidence supporting Basel capital requirements' effectiveness in emerging markets. Additionally, Okafor (2019) analysis of 16

commercial banks revealed that capital adequacy ratio (CAR) declines from 18.3% (2014) to 13.1% (2017), particularly among oil-dependent banks (10.2% CAR), strongly correlating with rising non-performing loans. In line with this, study by Adegbite (2020) attributed these trends to weak risk-based supervision (RBS) enforcement, revealing only 22% of high-risk banks received targeted reviews in the pre-crisis era, alongside inadequate dynamic provisioning and delayed risk reporting. These supervisory deficiencies allowed speculative lending practices and left banks vulnerable to commodity shocks, validating Minsky's financial instability hypothesis (Minsky, 1992).

Therefore, based on the empirical reviewed, critical gaps exist in the Nigeria's pre-recession supervision which include absence of ECB-style asset quality reviews for oil/Gas exposures, the most learned lesion by the financial supervisory authorities; lack of Fed-style forward-looking stress tests: and inefficient resource allocation compared to MAS's targeted examinations. This empirical evidence suggests Nigeria's post-2016 RBS reforms if fully implemented could replicate the 41% risk-modelling accuracy gains and 3x faster crisis recovery observed in benchmark jurisdictions, providing a clear roadmap for strengthening financial stability against future shocks.

Methodology

This study adopted a quantitative research design. The study explored the effect of Risk-Based Supervision in relationships between firms risks (measured by seven risk variables; credit risk, liquidity risk, operational risk, solvency risk, capital adequacy risk, market risk, and foreign exchange risk) on firms' performance (measured by ROA) before and during recession period in Nigeria. Therefore, the population of the study covers all the 25 listed DMBs under the regulation of Central Bank of Nigeria (CBN) as at 2019. Thirteen (13) sample banks out of were obtained using filters. The study applied secondary data from the financial statement and annual reports of the sampled banks for the periods of eight years, which is 2012 to 2019. The period of 2012 to 2015 was considered period before recession, while 2016 to 2019 was taken as recession period. The time frame was considered adequate because Nigerian economy witnessed high and persistent inflation in 2016 which lasted up to the period of 2019. Therefore, in order to observe the real behaviour of the extracted data, taking into consideration, the implementation of Risk-Based supervision (2011) the study considered only data covering the period of 2012-2019.

Variables Measurement and Description

Table 3.1 Variable Measurement and Description

Variable Name	Acronym	Description/Measurement	Apriori Expectation
Dependent Variable			
Return on Asset	ROA	Ratio of Earnings Before Tax Divided by Total Assets.	Positive sign
Independent Variables			
Credit Risk	CRERK	Ratio of Loan loss reserve divided by the total loans	Negative sign
Liquidity Risk	LIRK	Ratio of Total Loan to Total Deposit	Negative sign
Operational Risk	OPRK	Ratio of Operating Cost to Operating Income	Negative sign
Solvency Risk	SOLRK	Ratio of Shareholders' Funds to Total Liabilities	Negative sign
Capital Adequacy Risk	CAPRK	Ratio of Tier-1 Capital plus Tier-2 Capital to Risk Weighted Assets	Negative sign
Market Risk	MKTRK	Standard deviation of stock price of firm i at time t over one-year period	Negative sign
Foreign Exchange Risk	FXRK	Standard deviation of exchange rate of the Naira to US Dollar at time t over one-year period	Negative sign
Risk-Based Suprevion	RBS	The commitment of board risk management commitment, measured as the total number of the board risk management committees meeting during the financial year	Positive sign
Firm Size	FSZE	Measured by the natural logarithm of total asset of firm *i* over *t* period. To be used as the control variable	Positive sign
Recession	RCS	Dummy variable to take the form of "0" for the period before recession. And "1" for the recession period	Negative sign

Source: Authors' Compilations 2025

Technique of Data Analysis

This study used panel data regression model in testing the relationship between the variables of the study. Stata 14.0 software was employed to perform the panel regression estimate.

Model for testing the Hypotheses

The analytical model used in testing the interconnectedness between the study variables was presented based on panel data regression model presented by Brooks (2008).

$$ROA_{it}=\alpha_{it}+\beta_1 CRERK_{it}+\beta_2 LIRK_{it}+\beta_3 OPRK_{it}+\beta_4 SLVRK_{it}+\beta_5 CAADRK_{it}+\beta_6 MRTRK_{it}+\beta_7 FXRK_{it}+\beta_8 RBS_{it}+\beta_9+\beta_{10} CRDTRSKRBS_{it}+\beta_{11} LIQTRSKRBS_{it}+\beta_{12} OPRRISKRBS_{it}+\beta_{13} SOLVRSKRBS_{it}+\beta_{14} CADRSKRBS_{it}+\beta_{15} MKTRSKRBS_{it}+\beta_{17} FXRSKRBS_{it}+\beta_{18} SIZE_{it}+\mu_{it}$$

Presentation and Analysis of Regression Resul

Robustness check

Diagnostic tests of the data sets were conducted to check whether the assumptions underlying OLS estimation were satisfied. The results of the test shows that two assumptions, i.e, Normality test (P-value of 0.000) and Heteroscedasticity test (prob> chi2 of 0.0003) of the data set were failed to be satisfied, while Multicollinearity test (VIF Mean of 1.34) and Hausman Test (Prob>chi2 of 0.6650) were satisfied. This led in the acceptance and use of GLS regression estimation in the analysis.

Generalized Least Square (GLS) regression Analysis

This section presents two generalized least square (GLS) regression models, which tested the moderating effect of RBS efficacy in the relationship between the risk determinants and firms' performance. GLS Regression model of the moderating effect in consideration of the periods before (2012-2015) and in the 2016-2019 recession were presented.

GLS Regression model of the moderating effect in consideration of the periods before (2012-2015) and within the 2016-2019 recession/

The GLS regression model of the moderating effects of firms' risks and performance of financial service firms were estimated using the periods before the 2016 recession computed as dummy variable to take the value of zero (0), and 1 for the recession periods. The summary of the result is presented as panel 'A' and 'B' in table 4.1 and table 4.2.

Table 4.1: Panel 'A' GLS Regression Result of Moderating Effect before Recession (2012-2015)

Variables	Coefficient.	Std. Err.	T-value	P-value
CRDTRSKRBS	-0.3843	0.1260	-3.05	0.004***
LIQTRSKRBS	0.7264	0.4532	1.60	0.118
OPRRISKRBS	0.0899	0.2932	0.31	0.761
SOLVRSKRBS	19.331	5.4960	3.52	0.001***
CADRSKRBS	1.8676	4.3665	0.43	0.671
MKTRSKRBS	0.5095	0.4514	1.13	0.267
FXRSKKRBS	-0.2296	0.1644	-1.40	0.171
Cons.	-11.214	4.6283	-2.42	0.021***
R^2		0.7657		
R^2 Adjusted		0.6586		
Root MSE		0.7672		
Probabilty		0.0000		

*****, **, * indicate significant level at 1%, 5% and 10% significant level**

Source: Researcher's Compilations from Stata output 14.0, 2021

Table 4.2 Panel 'B' GLS Regression Result 0f Moderating Effect in the Recession (2016- 2019)

Variables	Coefficient.	Std. Err.	T-value	P-value
CRDTRSKRBS	0.2234	0.1866	1.20	0.239
LIQTRSKRBS	0.4048	0.3833	1.06	0.298
OPRRISKRBS	0.1807	0.1395	1.30	0.204
SOLVRSKRBS	-3.0095	16.236	-0.19	0.854
CADRSKRBS	-1.8840	0.7246	-2.60	0.014***
MKTRSKRBS	0.4954	0.3852	1.29	0.207
FXRSKKRBS	-0.0109	.01569	-0.70	0.491
Cons	6.4055	9.5373	0.67	0.506
R^2		0.6880		
R^2 Adjusted		0.5454		
Root MSE		0.9597		
Probabilty		0.0000		

*****, **, * indicate significant level at 1%, 5% and 10% significant level**

Source: Researcher's Compilations from Stata output 14.0, 2021

Table 4.1 presents the GLS regression model results for the moderating effect of RBS in the relationship between firms' risks and performance of banks in Nigeria. The model statistics test the combine interacting effects of the seven (7) firms' risks determinants, and one control variable before the 2016 recession periods, taking into consideration, a dummy variable to take the value of zero (0). On the contrary, table 4.2 shows similar results for the same estimated interacting terms, using a dummy variable to take the value of one (1) for the 2016-2019 recession periods.

As for the model statistics result from table 4.1, panel 'A' revealed R^2 value of approximately 77%. This indicates that, about 77% of the behaviour of the dependent variable is explained by the interactions of the exogenous variables before the 2016-2019 recession periods. That, firms' risks determinants used in the study model predict about 77% of the firms' performance before the emergence of 2016-2019 recession period. The Root MSE revealed the value of 0.767 shows the overall fitness of the model to test the relationship.

Similarly, table 4.2 presents the second model statistics for panel 'B' which produced the R^2 value of the interaction effects with approximately 69%. This indicates that, by including the moderating variable, the model predictors (firms' risks variables) used in the study explained about 69% of the firms' performance, which is somewhat different as compared with the result in panel A which is before the periods of recession. This indicates that the two models were dissimilar in explaining the moderating effects of RBS in relationship even when considering 2016-2019 recession periods in the main research model.

As for the individual variables, it can be observed in table 4.1, which is the period before recession, the study found significant negative effect of credit risk and solvency risk (r-value of -0.3842, a t-value of -3.05, and p-value of 0.00, and r-value of 19.3312, with a t-value of 3.52, and a p-value of 0.001 respectively) on performance. However, an insignificant negative moderating effect of RBS on the relationship between foreign exchange risk and performance (r-value of -0.0109, a t-value of -0.70, and a p-value of 0.171) were documented. Moreover, the findings revealed an insignificant positive interacting effective of RBS on the association

between liquidity risk, operational risk, capital adequacy risk, and market risk (r-value of 0.7263, t-value of 1.60, and a p-value of 0.118; r-value of 0.0899, t-value of -0.31 and a p-value of 0.761; r-value of 1.8676, a t-value of 0.43, and a p-value of 0.671; and r-value of 0.5094, t-value of 1.13, and a p-value of 0.267, respectively) on performance.

Similarly, it can also be observed from table 4.2, that is, the second model statistics for panel 'B'which is the period of recession, the study found insignificant positive interacting effects of RBS and credit risk (r-vale of 0.2234, t-value of 1.20, and a p-value of 0.239), liquidity risk (r-value of 0.4048, t-value of 1.06, and p-value of 0.298), operational risk (r-value of .180736, t-value of 1.30, and p-value of 0.204), and market risks (r-value of 0.4954, t-value of 1.29, and p-value of 0.207), respectively on banks performance. However, negative and insignificant interacting effect of RBS in the relationship between solvency risk (r-value of -3.0094, t-value of -0.19, and p-value of 0.854), and capital adequacy risk (r-value of -1.884, a t-value of -2.60, and a p-value of 0.014) respectively on banks' performance were documented.

Discussions of Findings

Based on the established findings of the study in panel "A", the interacting effect of RBS and credit risk and foreign exchange risk revealed a significant negative effect on performance. This shows the absence of a moderating effect of RBS on the relationship between credit risk exposure on performance. Similarly, the result indicated that the interacting effect of RBS and liquidity risk, operational risks, solvency risks, capital adequacy risks, and market risk revealed insignificant positive effect on the performance of banks before the 2016 recession period in Nigeria. These findings contradict the study of Barth et al. (2020) who provided a quantified RBS advantage, revealing that UK's PRA detected 82% of emerging risks in pre-crisis era.

As for the panel 'B', the model statistics revealed the moderating effects of RBS in the relationship between firms' risks determinants and firms' performance within the 2016-2019 recession periods. The results revealed that the interacting effects of RBS and solvency risk and foreign exchange risks have negative insignificant effect on firms' performance in the period of 2016 recession in Nigeria. However, capital adequacy risks were revealed to have a negative significant effect on banks' performance in Nigeria during recession periods; revealing the inefficacy of RBS in the relationship between bank-inherent risk and performance in the 2016 recession period in Nigeria. These findings in line with the findings of the study by Okafor (2019) who revealed a declining capital adequacy ratio (CAR) particularly among oil-dependent banks, with strong evidence of rising non-performing loans in the period of crisis. The result also contradicts the findings by Hossain et al. (2018) who revealed that combining LCR and leverage ratio implementations proves most effective for strengthening bank stability in the period of crisis.

As revealed from the result, the interacting effects of RBS and credit risk, liquidity risks, operational risk, and market risks were revealed to have positive but insignificant on the performance of banks in Nigeria in the recession period. The results are somewhat in line the findings by Arnould & Dehmej (2015) banks which revealed that RBS implementation reduced default probabilities and NPL ratios significantly in Eurozone in the recession era.

Conclusion

This study investigated the efficacy of Risk-Based Supervision on the relationship between bank-inherent risks and performance in Nigeria, taking into consideration, the 2012-2019 recession era. To attain to this, the study employed panel data regression analysis to estimate the expected relationship. As indicated from the findings of the study that Risk-Based supervision has a significant moderating effect in the relationship between firms' risks and performance of financial service firms in Nigeria. specifically, the study concluded that the interacting effect of RBS and credit risk and foreign exchange risk was found to have a significant negative effect on performance of banks in Nigeria before the recession era, while solvency risk and foreign exchange risks have negative insignificant effect. Similarly, the study concluded that the interacting effect of RBS and liquidity risk, operational risks, solvency risks, capital adequacy risks, and market risk revealed insignificant positive effect on the performance of banks before the 2016 recession period in Nigeria. Additionally, the study concluded that the interaction of RBS, solvency risk and foreign exchange risks on firms' performance is insignificantly negative in the period of 2016 recession in Nigeria, while capital adequacy risks were revealed to have a negative significant effect. Also, the study concluded that the interacting effects of RBS and credit risk, liquidity risks, operational risk, and market risks were revealed to have positive but insignificant on the performance of banks in Nigeria in the recession period.

The study recommended that CBN and NDIC as the apex regulatory and supervisory bodies in the Nigerian banking sector should therefore continue to detail the facilitation of RBS approach within the sector. In line with the findings of the study, it was recommended that the apex regulators should ensure that the RBS core principle of evaluation of control, management and governance are applied at both local levels, where the control are applied at business level; and high level, where enterprise-wide control functions are applied. Additionally, as risk exposure has spill-over effects and it can easily be transferred from one industry to another, future studies should consider replicating same study in other industries such as manufacturing industry, constructions industry, and service industries among others.

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