



MODERATING EFFECT OF RISK-BASED SUPERVISION ON THE RELATIONSHIP BETWEEN FIRMS RISKS AND PERFORMANCE OF LISTED FINANCIAL SERVICE FIRMS IN NIGERIA

Abubakar Umar

Department of Business Administration, AL-Qalam University, Katsina
+23431834559 - aumar198498@gmail.com

Abstract

Nigerian financial firms have been recording recurrent failure over the years. This was largely due to the inability of institutions to proactively manage the inherent risks related to business operations. However, the implementation of Risk-Based Supervision (RBS) approach was aimed at curtailing the ceaseless failure. This study examined the moderating effect of RBS in strengthening the relationship between firms' risk and performance of financial firms in Nigeria. The study used longitudinal research design in exploring the moderating effect of RBS in curtailing the effect of firm risk determinants measured by credit risk, liquidity risk, operational risk, solvency risk, capital adequacy risk, market risk and foreign exchange risk on the financial service firms' performance. Secondary data obtained from the annual financial statements of the firms for the periods of 2012-2019 were used in the analysis. The study utilized panel data regression model to estimate the relationship. As for the interacting effects, the study revealed negative and significant moderating effects of RBS in the relationship between credit risk, liquidity risk, solvency risk, capital adequacy risk, foreign exchange risk and performance; and insignificant positive moderating effects of RBS in the relationship between operational risk and market risk were documented. The study concluded that Risk-Based Supervision moderated the relationship between firm risks and the performance of financial service firms in Nigeria. The study recommended that financial regulators should continue to offer greater emphasis in understanding and assessing the quality of the firms' risk management system in line with the firms' strength to identifying, measuring, monitoring and controlling risks exposure within a timely and appropriate manner in line with the RBS requirements.

Key words: Risk-Based Supervision (RBS), Firm Risk, Firms' Financial Performance

1. Introduction

Performance is considered the primary driver for organizations to achieve their strategic goals. High level performance helps businesses redesign resource allocation systems to achieve greater market share and continued business survival (Mardiana, 2018). An important aspect of any economy is the proper functioning of the financial services sector. Globally, researchers, institutional managers, investors, and regulators are concerned about the effective performance of financial services firms (Harelimana, 2017). This is largely due to the fact that they provide the right environment for businesses and individuals to overcome economic uncertainty by

allocating funds from lenders to borrowers, thereby expanding the scope for the quality and quantity of real investment around the world (Maruta, 2019).

Performance is largely affected by diverse risks surrounding business opportunities, the outcome which influence firms' cash flow prospects, thereby ultimately reducing overall performance (Kakanda, Salim, & Chandren, 2018). Risk is important to financial services firms due to the nature of their business operations. Therefore, there are different forms of risk exposure that affect the company's business operations. Various studies have identified different risks exposure affecting firms, and the most common forms of these risks to be important to financial service firms include credit risk, liquidity risk, operational risk, solvency risk, market risk, foreign risk, purchasing power risks and political risks among others (Boukaira & Hakimi, 2020); Kassi, Rathnayake, & Edjoukou; 2019; (Pradita & Geraldina, 2019).

In Nigeria, financial service firms have witnessed deteriorating performance due to problems associated with poor risk management practices and regulatory lapses ((Adeleke, Bahaudin, Kamaruddeen, Bamgbade, & Ali, 2019; CBN, 2018). The contagious effect of poor risk management practices resulted in stock market crash, credit crunch, revenue decline, poor capitalization, and persistent illiquidity in most of the financial service firms (CBN, 2018). Thus, the outcome of these problems resulted in excessive earning deterioration in most financial institutions. This resulted to the emergence of a number of regulations set up within the Nigerian financial sector to oversee the activities of financial service firms, and part of these regulations is the establishment of risk-based supervision (RBS) approach (Jayasekara, 2021).

Implementation of Risk-Based Supervision approach in the Nigerian financial sector was facilitated to guide against adverse effect of inherent risks exposure and to ensure sound risk management in institutions (Sixishe, 2011). However, past studies have established a link between risk management practices and firms' performance using different risk components in their respective models. For instance, (Adeusi et al., 2014; Ekinci, 2016; Sempabwa & Kariuki, 2017), studied the effect of firms' risk on performance of banks and revealed a positive significant relationship; while (Al-Tamimi et al., 2015; Isaac, 2015; Ly, 2016) in similar studies revealed negative significant effects. The results from these studies were mixed, indicating inconclusive findings. In line with this inconclusive findings, (Kenny & Judd, 2014; O'Rourke & Mackinnon, 2018; A. D. Wu & Zumbo, 2008) recommend the need for a third variable, (moderator) in order to have a deeper insight of what bridges the causal relationship between the variables of the study.

Risk-Based Supervision cantered on the supervisors' efforts to assess the various firms' business lines and the associated management quality and internal controls to identify areas of greatest risk and to direct supervisory resources for mitigation. As a regulatory guideline, RBS approach provided that institutions' board of directors should develop an independent structure (the Board Risk Management Committee, BRMC) responsible for strengthening firms' activities towards achieving the best risk management practices and improve performance (Central Bank of Nigeria, 2019). Although, past studies have explored the direct link between risk committee and financial firms' performance (Elamer & Benyazid, 2018a), little attention has been given in the literature to study the role of BRMC towards strengthening the relationship between firms risk and the performance of financial service in Nigeria. Therefore, it is against this background that this study seeks to investigate the moderating effect of risk-based supervision (RBS) in the relationship between firms' risk and performance of financial firms in Nigeria.

The remaining aspects of this paper is organized as follows: section two offered review of relevant literature related to firms' performance, RBS, and firms' risks. This was proceeded by the presentation of the theoretical and conceptual framework. Section three presents the methodology guiding 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; and suggestion for future study.

2.1 Concept of Performance

Firms' financial performance analysis has received prominent attention from academic researchers, financial institutions, professional bodies and other institutional inventors. Researchers have documented varied definitions, categorizations and selections of performance measurements in the analysis of firms' financial performance. This is evidenced based on the work of and not limited to Prasad and Shrimal (2014), Duraj and Moci (2015), Komande (2017). They were of the opinion that institutions' financial performance can be measured on the perspectives of profitability, efficiency, growth, market shares, ownership which are internally determined, and other macro-economic determinants that are external to any financial institution. Similarly, (Bae et al., 2008) the reflection of firms performance is balanced towards the institutional profitability and growth perspectives. Hence, performance in this study is defined as the ability of financial institutions to generate sufficient income through effective and efficient utilizations of its assets.

2.2 Concept of Risks-Based Supervision

According to (Randle, 2009), RBS is defined as the supervisors ability to appraise the method by which individual firm and the entire system identify and control their inherent risks, detecting areas with supreme risks and taking intervention measures by allocating resources to those areas for mitigation. (Nidhiprabha & Nidhiprabha, 2018) considered RBS as a structured framework designed by supervisors to assists in identifying the risks exposed to a company, the assessment of the company's risks management profile, and the firm's financial exposure to possible adverse experiences. It aims at reassuring the smooth facilitation of the payment system, and deterring systematic failures of institution within the financial environment (BCBS, 2012). The approach serves as a consistent and reliable framework used for evaluating institutions through discrete assessment of the inherent risks and management practices.

2.3 Concept of Firms' Risks

Risks can be seen as any form of uncertainty outcome triggered by some eventualities which may occur and may likely affect an institution's ability to achieve its business objectives. (Dowd, 1999) regards risk as the potential that the actual return from an investment would vary from the expected, and may provide chances of losing the original investment in part or in whole. These can be categorised into and not limited to credit risk, liquidity risk, operational risk, solvency risk, capital adequacy risk market risk, foreign exchange risk, and market risk among others.

2.3.1 Credit Risk and Performance

Credit risk refers to the risk arising due to inability of a counterpart to meet its contractual commitments (Spuch et al., 2015). Credit risk exposure has been an issue of critical concern to most financial service firms most especially those operating in the banking sector (CBN, 2014). In Nigeria, financial service firms have recording severe cases of high credit default exposure as a result of persistent rise in the level of bad debt and high rate of provisioning due to weak credit

policies which affected the earnings of most financial service firms, thereby resulting into excessive liquidity crisis.

Past empirical evidences indicated the existence of relationship between credit risk and performance with sound theoretical antecedents. For instance, Ogundajo, et al., (2020) investigated the effect of credit risk on the performance of deposit money banks in Nigeria. Using panel data regression model to estimate the effect of credit risk measured by the firms' non-performing loans and loan loss provisions on performance indicated by the firms' return on capital (ROC), the result from the revealed a significant negative effect of non-performing loan on performance, and a negative insignificant effect of loan loss provisions on performance. In a similar study, (Ozurumba, 2016) examined the impact of credit risk on the financial performance of banks in Nigeria. Using ordinary least square method and ratio analysis, study revealed an inverse relationship between non-performing loans, loan loss provision and the performance indicators, while loans and advances are positively related to performance indicators. It was concluded that the effects of non-performing loans on Commercial Banks' performance Nigeria is negative and cannot be underestimated.

More so, Lawrence, Ogundajo, et al., (2020) studied the effect of credit risk on the performance of commercial banks in South Africa. Banks' return on equity (ROE) and return on assets (ROA) were employed as the performance indicators; while banks' non-performing loans was used as the credit risk indicator. The findings of the study revealed a positive significant effect of credit risk on performance. Moreover, Kutum (2017) investigated the effects of credit risk on the profitability of 5 Palestinian banks covering the periods using a panel regression model to estimate the relationship. Credit risks variables measured by the firms' Net Charge Off (Impairments) to Total Loans and Advances, Non-Performing Loans to Total Loans and Advances, and Pre-Provision Profit to Total Loans and Advances; while firms' performance indicators were measured by the firms' ROA and ROE. The findings from the analysis revealed insignificant positive effect of credit risk and performance of banks in Palestine. In a similar study by (Nwude & Okeke, 2018) employing similar variables in the Nigerian context, the study revealed a positive significant impact of non-performing loans on the return on asset and return on equity of the selected banks.

Therefore, empirical evidences on the effects of credit risk on performance is mixed and inconclusive, hence, the need for a third variable (moderator). Risk-Based Supervision (RBS) approach in the Nigerian financial sector was envisioned to guide against the adverse effect of the aforementioned risk exposure and to ensure sound risk management in institutions. Hence, RBS approach can be considered as an intervening variable in the relationship between firm risks and performance. Hence, study hypothesises that:

H0₁: Risk-Based Supervision does not significantly moderate the relationship between credit performance of listed of listed financial service firms in Nigeria.

2.3.2 Liquidity risk and Performance

Liquidity risk is the risk that arise due to inability of firms 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 (L. Li, 2016). (Gârleanu & Pedersen, 2007) asserts that liquidity risks measure the extent a financial firm is capable of converting its assets into cash quickly without running into capital loss.

Review of past studies revealed opposing results on the effect of liquidity risks on firms' performance. For instance, Sathyamoorthi, et al., (2019) investigate the effect of liquidity risk on the performance of banks in Botswana. Using multiple regression analysis to estimate the effect of liquidity risks measured by the firms' total debt to total assets, total debt to total equity, total Equity to Total assets, and Loan to deposit ratio on firms' performance indicators measured by ROA and ROE, the result from the analysis revealed a negative significant effect of loan to deposit ratio on performance. This is in line with the study of (Y. Chen et al., 2018) in the banking sector of 12 advanced countries of Australia, Canada, France, Germany, Italy, Japan, Luxembourg, Netherlands, Switzerland, Taiwan, United Kingdom and United States. Using panel data regression to estimate the relationship between liquidity risks variable measured by financing gap ratio (FGAPR) on the banks' performance indicators measured by return on average assets (ROAA) and return on average equity (ROAE), the study concluded that liquidity risk is negatively related to bank performance in market-based financial system; while it has no effect on the bank-based financial system.

Charmier, Musah, Akomeah, Gakpetor (2018) investigated the effect of liquidity risk on the performance of commercial banks in Ghana using panel regression model estimating the relationship. effects of the independent variables measured by the firms' liquid asset to total assets and liquid assets to interest bearing liabilities, on the dependent variables measured by the firms' ROA and ROE. The findings revealed a positive significant relationship between liquidity risk variables (measured by firms' liquid asset to total assets and liquid assets to interest bearing liabilities) on performance (ROA), while an insignificant negative relationship with ROE was established. This is in line with the findings of the study by (Zahisyam et al., 2017) who examined the effect of financial risk on the performance of OCBC 29 Bank in Malaysia. Using correlation and regression analysis, the study revealed a positive significant relationship between liquidity ratios and performance indicators.

Hence, findings from empirical literature on the effects of liquidity risk on performance is yet to be resolved due to the existence of mixed and inconclusive findings. Based on the prevailing discussion, RBS as a regulatory approach to managing firms' risks can be integrated for profound insight regarding what bridges the causal relationship between liquidity risk and performance of financial service firms in Nigeria. Therefore, the study hypothesizes that:

H0₂: Risk-Based Supervision does not significantly moderate the relationship between liquidity risks and performance of listed financial service firms in Nigeria.

2.3.3 Capital adequacy Risk and Performance

Capital adequacy risk is regarded 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 (Glantz & Mun, 2010). according to (Abou-El-Sood, 2017; Ogboi & Unuafé, 2013), capital adequacy by its nature, measures the amount of firm's capital expressed as a percentage of its risk weighted credit exposures.

Past empirical studies have revealed the existence of relationship between capital adequacy risk measures and performance with sound theoretical antecedents. For instance, Haris, Tan, Malik and Ul-Ain (2020) investigated the effect of capitalization on the performance of commercial banks in Pakistan using panel data regression model to estimating the relationship. Banks' Capital Ratio (CR), Capital Adequacy Ratio (CAR), and Minimum Capital Requirement (MCR) were used as the capitalization indicators; while banks' ROAE and ROAA, NIM, PM were used

to measure banks' performance. The result from the analysis revealed a significant positive effect of capitalization on performance. Additionally, (Lotto, 2018) investigated the impact of capital requirements regulation on bank operating efficiency in Tanzania using panel data regression model in estimate the relationship. The results revealed that banks' ratio of total bank capital to total assets as the capital adequacy indicator has a positive significant effect the banks' ratio of operating expense to operating income as the efficiency indicator.

A similar study by (Nyawir et al., 2017) was established to investigate the relationship between capital requirement and financial performance of commercial banks in Kenya. Using panel data regression model to estimate the relationship between the banks' tier 1 Capital and capital adequacy as the capital requirement indicators, and the banks' return on assets (ROA), return on equity (ROE) and net interest margin (NIM) as the performance indicators, the study revealed a positive significant relationship between capital requirements and ROA and ROE, while insignificant effect on NIM was revealed. Additionally, (de Bandt et al., 2018) in a similar study investigated the effect of actual capital, optimal and regulatory capital on the performance of commercial banks in France covering the period of 2007-2014. Using panel data regression model in estimating the relationship, the findings from the analysis indicated that actual capital and optimal capital are positively and significantly associated with performance, while effect of regulatory capital on profitability appears insignificant, revealing that increasing capital requirements have not been detrimental to bank profitability in France. A study by (Udom & Eze, 2018) on the effect of capital adequacy requirements on the performance of commercial banks in Nigeria revealed a positive significant impact of the banks' capital adequacy indicators Qualifying Capital (TQC) and Capital Risk Weighted Assets (CRWA) on performance, while Adjusted Shareholders Fund (ASF) revealed to have a negative significant impact on the banks' performance.

Therefore, empirical evidences on the effects of capital adequacy risk on firms' performance is yet to be resolved as the direction of relationship between capital adequacy risk and firms' financial performance was found to be inconclusive. Giving the inconsistencies in the findings, it can be clear that the inclusion of RBS as regulatory approach provided for a regulatory capital reserved to mitigate any possible exposure arising out the firms' operations can further moderate the relationship between firm risk and performance. Based on the prevailing discussion, the study hypothesis that:

H0₂: Risk-Based Supervision does not significantly moderate the relationship between capital adequacy risks and performance of listed financial service firms in Nigeria.

2.3.4 Solvency Risk and Performance

Solvency risks is the inability of a firm to meet its long-term expenses, and to attain long-term growth and expansion (DABO et al., 2018). It measures the ability of an institution to efficiently settle its short-term and long-term obligations without incurring adverse losses (Aldasoro & Park, 2018). (Ferrouhi, 2014) defined solvency as the ability of a firm to meet its long-term expenses and to attain long-term growth and expansion.

Past empirical evidences have established the existence of relationship between solvency risk and firms' financial performance with sound theoretical antecedents. For instance, Dabo, Andow, and James (2018) investigated the effect of solvency risk on the performance of insurance firms in Nigeria covering the period of 2016 financial year. Using linear regression model to estimate the relationship, the findings from the analysis revealed a positive significant effect of solvency

risk and the performance insurance firms in Nigeria. This is in line with the study by (M Abdullah, 2016b) who explored the relationship between solvency and financial performance of commercial banks in Bangladesh. Using correlation and regression analysis, the study established a positive significant effect of the banks' book value of equity to total liabilities as the solvency indicator, and the banks' profitability as the performance indicator. These contradict the findings of the study by (Sakouvogui & Shaik, 2020) who investigated the effects of solvency risk on the performance of US banks. The study employed Stochastic Frontier Analysis and Data Envelopment Analysis to estimate the effect of the dependent variable measured by the banks' cost efficiency as performance indicator, and the independent variable measured by the banks' solvency ratio. The findings revealed a significant negative effect of solvency in performance of banks in US. This in line with the findings of a study by (Kyule, 2015) who studied the impact of solvency risks on the financial performance of firms listed at the Nairobi Securities Exchange. Using the ratio of shareholders' funds to total liabilities as a solvency indicator, the result revealed a negative significant effect of solvency on performance in Kenya.

Hence empirical findings on the measurement and effects of solvency risk on performance is yet to be resolved. Based on the prevailing discussion, RBS as a regulatory approach to managing firms' inherent risk in the financial sector can interact on the effect of the relationship between solvency risks and firms' performance. There, based on the prevailing evidences, this study hypothesises that:

H0₂: Risk-Based Supervision does not significantly moderate the relationship between solvency risks and performance of listed of listed financial service firms in Nigeria.

2.3.5 Operational Risk and Performance

Operational risk is the risk that stems out of failure of people, processes and technology which leads to severe damages (CBN, 2014) . It arises as a result of the breakdown of internal procedures, people, policies and system as well as external developments. Moreover, operation risk is the outcome of firm's overall operations, which is mostly derived not only from the real institutional investments to generate revenue, but also due to the cost attached in the process of carrying out the real business undertaken by institutions (Aven, 2016; Basel Committee on Banking Supervision, 2011; Pleune, 2016).

Moreover, review of past empirical studies revealed divergent results on the effect of operational risks on firms' performance. (Boukaira & Hakimi, 2020) investigated the relationship between operational risk and performance of Tunisian banks. Using panel regression model to estimate the effects of operational risk measured by the firms' capital charges to hedge on the banks' net interest margin as the performance indicator, the findings revealed a positive significant relationship between operational risk and performance. Similarly, (Fadun & Oye, 2020) in a similar study in Nigeria documented a positive relationship between operational risk indicator measured by the banks' operating expenses to net operating income on the banks' ROA. Additionally, (Lyambiko, 2015) studied the effect of operational risks on the performance of commercial banks in Kenya documented a positive significant effect of operational risk measured by the banks' ratio of Operating expenses to net operating income on ROA.

Hower, (Zahisyam et al., 2017) examined the effect of operational risk and performance in the banking institution of OCBC Bank, Malaysia covering the period of 2011-2015. Using correlation and regression analysis model, the result a revealed a negative insignificant

relationship between operational risk variable measured by the banks' operating efficiency ratio on the banks' return on assets (ROA) and return on equity (ROE) as the performance indicators. In line with this findings, (Hoseininassab et al., 2013) used return on asset volatility, stock return volatility and stockholders' equity as operational risk indicators to study the impact of operational risks on banks' efficiency and revealed a negative insignificant relationship.

Therefore, empirical findings on the effects of operational risk on performance is yet to be resolved. Based on the prevailing discussion, RBS as a regulatory guideline ensures firms' operational efficiency in inherent risk in the financial sector. Based on the prevailing discussion, the study hypothesis that:

Risk-Based Supervision does not significantly moderate the relationship between operational risks and performance of listed of listed financial service firms in Nigeria.

2.3.6 Market Risk and Performance

Market risk refers to the uncertainty caused by markets instabilities, indicating the possibility of a firm losing its earnings due to fluctuations in market prices (Mirković et al., 2013). The effect of market risk exposure in the financial sector resulted in potential losses in the off-sheets and on-balance sheet items of most firms. The unexpected movement in market prices were reported to have generated negative effect on the institutions' earnings (CBN, 2018b).

Past studies have documented the existence of relationship between market risks and firms' performance with sound theoretical antecedents. For instance, Kassi, Rathnayake, and Edjoukou (2019) investigated the effect of market risk on performance in China using panel regression model in estimating the relationship. The outcome of the analysis revealed the market risk measured by the firms' degree of financial leverage, the book-to-market ratio, and the gearing ratio has negative significant effect on the firms' profitability indicators. This is line with the outcome of the study by (Abdellahi et al., 2017) who investigated the impact of market risk on the financial performance of banks in Tehran for the period of 2010 to 2014. Using panel regression model to estimate the effect of market risks measured by the natural logarithm of the industry market value the banks' return on assets (ROA), return on equity (ROE) and net interest margin (NIM) as the performance indicator, the result from the analysis revealed a positive significant effect of the market and ROA, and a negative significant effect on the ROE and NIM.

However, (Sempabwa & Kariuki, 2017) in his study investigated the effect of market risk on the financial performance of banks in Rwanda. The study employed regression analysis model to estimate the effect of market risks on the banks' return on assets (ROA) as the performance indicator. The result from the analysis revealed a positive significant impact of market risk on the banks' performance. In line with this, (Ekinci, 2016) investigated the effect of market risk on the financial performance of 4 banks in Turkey. Using GARCH (1, 1) model to estimate the the effect of changes in the banks' interest rate (INT) and foreign exchange rate (FX) as the market risk indicators, on the return of bank index/bank stocks as the performance indicator, the results revealed a positive significant effect of market risk indicators on the volatility of the bank profitability.

Therefore, based on the foregoing discussions, empirical evidences on the effects of market risk on firms' performance is yet to be resolved as the direction of the relationship the variables were found to be inconclusive. Giving the inconsistencies in the findings, the inclusion of RBS as regulatory approach in managing firms' inherent risks can further moderate the relationship

between market risk and performance. Based on the prevailing discussion, the study hypothesis that:

H0₂: Risk-Based Supervision does not significantly moderate the relationship between market risks and performance of listed of listed financial service firms in Nigeria.

2.3.7 Foreign Exchange Risk and Performance

Foreign exchange risk is regarded as the potential loss resulting from exchange rate fluctuation (Papaioannou, 2006). It is defined as the risk resulting out of unhedged exposure, or indirect loss from the institutions' cash flows, assets and liabilities, net profit, and the exposure on the firms' stock market value resulting from exchange rate fluctuation (Papaioannou, 2006).

Past empirical evidences have established the existence of relationship between foreign exchange risks indicators and performance. For instance, (Pradita & Geraldina, 2019) studied the effect of currency risk on the performance of banks in Indonesia. Using panel regression model to estimate the effect of the rate of transaction fees and the rate of translation risk as the currency risk indicators on the banks' ROA, the study revealed a significant positive effect. Similarly, (Marfo, 2016) examined the effect of exchange rate on the performance of mutual funds in Ghana for the period of 2012-2015. Using Autoregressive Distributed Lag (ARDL) model to estimate the effect of the official exchange rate of the Ghana Cedes/US\$ as the exchange rate indicator on the dependent variable measured by the firm's share price, the study revealed a negative insignificant impact of exchange rate on the performance of mutual funds in Ghana in the long-run while in the short-run, the relationship was found to be negative.

Similarly, (Raza, Ali, & Ali, 2017) explored the impact of foreign exchange rate on banks' stock return in Pakistan using Ordinary Least Square (OLS) multiple regression model with Generalize Method of Movement (GMM) to estimate the relationship. Weighted Least Square (WLS) and Generalize Auto Regression Conditional Heteroskedasticity - GARCH (1,1) estimation model was applied to estimate conditional return and volatility. Using Banks stock prices measured by the return on the market index as the dependent variable, and independent variable measured by the return on the foreign exchange rate, the finding from the analysis revealed a positive significant impact of exchange rate on the banks' stock returns. In line with this findings, (Ofosu-hene & Amoh, 2016) investigated the impact of exchange rate on the performance of banks in Ghana using panel regression model with Generalized Method of Moment (GMM) in estimating the relationship. The study revealed that FX risk measured by the average annual exchange rate, has a positive significant impact on ROA, and a positive insignificant impact on ROE.

Therefore, empirical findings on the effects of foreign exchange risk on performance is inconclusive. Thus, the inclusion of RBS as regulatory approach in managing firms' inherent risks can further moderate the relationship between foreign exchange risk and performance. Based on the prevailing discussion, the study hypothesis that:

H0₂: Risk-Based Supervision does not significantly moderate the relationship between foreign exchange risks and performance of listed of listed financial service firms in Nigeria.

3. Methodology

This research was based on quantitative approach. The study was carried out to explore 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). Therefore, the population of the study covers all the 25 listed DMBs under the regulation of Central Bank of Nigeria (CBN). Thirteen (13) sample banks out of were obtained using filters. The study used secondary data from the financial statement and annual reports of the sampled firms for the periods of eight years, which is 2012 to 2019. The period was considered adequate because Nigerian economy witnessed high and persistent inflation which lasted up to the end 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.

3.1 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>i</i> at time <i>t</i> over one-year period	Negative sign
Foreign Exchange Risk	FXRK	Standard deviation of exchange rate of the Naira to US Dollar at time <i>t</i> over one-year period	Negative sign
Risk-Based Supervision	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>i</i> over <i>t</i> period. To be used as the control variable	Positive sign

Source: Authors' Compilations 2023

3.2 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.

3.3 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):

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

4. Presentation and Analysis of Regression Result

4.1 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 were failed to be satisfied. This led in the acceptance and use of GLS regression estimation in the analysis.

DIAGNOSTIC TESTS OF OLS ASSUMPTIONS

Normality	P-value	0.000	Not satisfied
Heteroscedasticity	prob> chi2	0.0003	Not satisfied
Autocorrelation	f-value	0.2091	Satisfied
Multicollinearity	VIF Mean	1.34	Satisfied
Hausman Test	Prob>chi2	0.6650	GLS RE

4.2 Generalized Least Square (GLS) regression Analysis

The results of the Generalized Least Square (GLS) regression model of the moderation effect for the estimated relationship are presented as follows.

Table 4.7 Generalize Least Square Regression Result for Moderating Effect

Variables	Coefficient	Standard Error	Z-values	P-values
CRD RSK	0.9534	0.4415	2.16	0.031
LQTY RSK	-1.6899	0.8870	-1.91	0.057
OPR RSK	-0.5950	0.4189	-1.42	0.155
SLV RSK	78.567	23.402	3.36	0.001
CAD RSK	7.4138	1.7831	4.16	0.000
MKT RSK	-0.8790	0.9807	-0.90	0.370
FX RSK	0.0898	0.0414	2.17	0.030
BSZ	-0.2110	0.0617	-3.42	0.001
RBS	1.8036	0.8959	2.01	0.044
CRDTRSKRBS	-0.2117	0.1069	-1.98	0.048
LIQTRSKBRBS	-0.6140	0.2770	-2.22	0.027
OPRRISKRBS	0.1128	0.1064	1.06	0.289
SOLVRSKRBS	-19.248	5.8889	-3.27	0.001
CADRSKRBS	-1.8970	0.4913	-3.86	0.000
MKTRSKRBS	0.3137	0.2501	1.25	0.210
FXRSKRBS	-0.0284	0.0127	-2.26	0.024
Constant	-3.0076	3.5285	-0.85	0.394
R-Squared	0.6034			
Wald chi2	132.37			
Prob.	0.000			

*, **, *** imply significant at the 10%, 5% and 1% levels respectively

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

Table 4.7 above reveals the R-squared (R^2) value of the observed constructs. The GLS results of the moderating effect of RBS in the relationship between firms' risks and performance of financial service firms reveals the R^2 value of 60.34%. Out of the seven variables, five hypotheses were revealed to be significant, while two were revealed to not to be significant as indicated in the above table. This suggests that the explanatory power of the model used in the study stood at 60.34%. Invariably, the remaining 39.56% is explained by other variables that have not been captured in the explicit model of the study. The outcome of the result reveals that there is a significant moderating effect of RBS in the relationship between firms' risks and performance of financial service firms in Nigeria.

Out of the seven interacting variable, five hypotheses were revealed to be significant, while two were revealed to not to be significant as indicated in the above table. The study found significant moderating effects of RBS in the relationship credit risk (r-value of -0.2117, z-value of -1.98 and a p-value of 0.048), liquidity risk (r-value of -0.6140, a z-value of -1.98, and a p-value of 0.027), solvency risk (r-value of -19.248, a z-value of -3.27, and p-value of 0.001), capital adequacy risk (r-value of -1.8970, a z-value of -3.86, and p-value of 0.000), and foreign exchange risk (r-value of -0.0284, a z-value of -2.26, and a p-value of 0.024) on performance; while operational risk (r-value of 0.1128, with a z-value of 1.06, and p-value of 0.289) and market risk (r-value of 0.3137, with a z-value of 1.25 and a p-value of 0.210) were revealed to have insignificant moderating effects on performance.

4.3 Discussion of Finding

The interacting effect of RBS and credit risk has a negative coefficient of -0.2117, z-value of -1.98 and a p-value of 0.048. The result shows an inverse moderating effect of RBS in the relationship between credit risk and performance. This in line the apriori expectation of the study which expects a negative moderating effect of RBS in the relationship between firms' risk and performance. The implication of this is that, excessive loan losses are curtailed which minimizes the amount of provisioning that should be paid out of the firms' profits, which eventually improved performance. Therefore, this indicates that RBS has a negative and significant moderating effect in the relationship between credit risk and performance.

Similarly, the interacting effect of RBS and liquidity risk returned a negative coefficient of -0.6140, a z-value of -1.98, and a p-value of 0.027, indicating an inverse moderating effect. As indicated by the result, RBS has a negative and significant moderating effect in the relationship between liquidity risk and performance. The finding is in line with the apriori expectation established in the study that RBS has a negative moderating effect in the relationship between liquidity risks and performance. This signified that RBS indicated by BRMC' commitment have maintained significant effort in managing liquidity risks exposure in the areas of setting internal limit and control as regards to the firms' liquidity and reserve ratios, as well as the assets and liability gap measures and ensure compliance in line with the regulatory requirement. These revealed that RBS moderates the effect of liquidity risk on performance.

As indicated in the results, the coefficient of the interacting effect of RBS and operational risk revealed a positive coefficient value of 0.1128, with a z-value of 1.06, and p-value of 0.289, indicating that BRMC has a positive but insignificant moderating effect in the relationship between operational risk and performance. This negates the prior expectation of the study which expects a negative moderating effect. This signifies that RBS indicated by the BRMC' has a

positive effect on performance. In the overall, RBS does not dampen the relationship between operational risk and performance.

Moreover, the result shows that the interacting effect of RBS and solvency risk revealed a negative and significant effect on performance. As revealed in the above table, the result revealed a negative coefficient value of -19.248, a z-value of -3.27, and p-value of 0.001, and this in line with the a priori expectation. This shows that RBS indicated by the firms' BRMC ensure high level commitment in ensuring that firms' managements maintained greater efforts in discharging their long-term obligations in line with the regulatory RBS requirement.

From the result, the interacting effect of RBS and capital adequacy risk has a negative coefficient value of -1.8970, a z-value of -3.86, and p-value of 0.000, revealing that RBS has a negative and significant moderating effect in the relationship between solvency risk and performance. The result shows the moderating power of RBS as the sign of coefficient value has turned to a negative in line with the expectation. This revealed the extent of BRMC's commitment towards ensuring that financial institutions maintained the minimum capital that will absorb the possible risks exposure arising from their operations; so as to ensure efficient performance. Similarly, this result is in line with the initial expectation that RBS has a negative moderating effects in the relationship between capital adequacy risk and performance.

From the result, the result revealed that the interacting effect of RBS and market risk has a positive coefficient value of 0.3137, with a z-value of 1.25 and a p-value of 0.210. This is contrary to the prior expectation of the study which expects that RBS has a negative moderating effect of RBS in the relationship between market risk and firms' performance. This indicates that RBS does not have a significant moderating effect in the relationship between market risks and performance.

Also revealed from the result, the interacting effect of RBS and foreign exchange risk returned a negative coefficient of -0.0284, a z-value of -2.26, and a p-value of 0.024. This revealed that RBS has a negative and significant moderating effect in the relationship between foreign exchange risks and performance. This is in line with the prior expectation of the study which established that RBS has a negative moderating effect in the relationship between foreign exchange risk and performance.

5. Conclusion

This study explored the intervening effects of risk-based supervision in the relationship between firms' risks and the performance of financial service firms in Nigeria. In line with the this, specific objectives were raised in line with the main objective of the study. The study applied panel data regression model to estimate the interacting relationship. The study revealed the existence of a significant moderating effects of RBS in the relationship credit risk, liquidity risk, solvency risk, capital adequacy risk, and foreign exchange risk on performance; while operational risk and market risk were revealed to have insignificant moderating effects on performance.

In line with the findings of the study which revealed that Risk-Based supervision has a significant moderating effect in the relationship between firms' risks and performance of financial service firms in Nigeria, CBN, NDIC and NAICOM should continue to detail the facilitation of RBS approach within the Nigerian financial sector. The apex regulators should continue to offer greater emphasis in understanding and assessing the quality of the firms' risk

management system in line with the firms' strength to identifying, measuring, monitoring and controlling risks exposure within a timely and appropriate manner in line with the RBS requirements.

5.1 Limitations of the study and Suggestions for Further Studies

This study offered suggestions for additional future research efforts. The study covered seven firms' risk variables (credit risk, liquidity risk, operational risk, solvency risk, capital adequacy risk, market risk, foreign exchange risk), moderating variable (RBS), and a dependent variable (ROA). In line with the Risk-Based Supervision principles of wholistic approach to risks management practices, all the inherent firms' risk should be studied to ascertain their effects on firms performance. Based on this, future studies should consider adding other firms' risk constructs in a single empirical model to explore their effects on firms' performance.

Additionally, as risk-based supervision ensures wholistic approach to risks management practices, future studies should consider deeper exploration by disaggregating the effect of these risks' variable on firms based on high, moderate and low risks firms with a view to determining whether the established relationship between those risks' variables were driven by high and low value firms for further regulatory actions.

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