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RISK FINANCING AND PERFORMANCE OF SELECTED DEPOSIT MONEY BANKS IN NIGERIA

Musa A. OBALOLA[1]

Fatimo Titilope AZEEZ[2]

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Abstract

Business leaders no longer view risks as mere hazards to be avoided but also as opportunities that should be exploited. Thus, risk in business doesn't depict an adverse situation but the mismanaged, misunderstood, misplaced or unintended risk creates an adverse effect. This study was carried out to examine the influence of risk financing on the financial performance of banking institutions in Nigeria. Risk financing was examined through risk transfer proxy as insurance, risk hedging, and risk diversification. Performance was measured using profitability (Return on Asset), liquidity (liquidity ratio), and shareholder's value (Return on Equity). The study adopted an ex post facto research design. The study focused on the eight (8) deposit money banks licensed with international authorization by the Central Bank of Nigeria due to their wide range of expertise and experience. Data was drawn from the financial statements of the selected banks for the period of 11 years (2012 – 2022). Following pre-test such a CD test, unit root and slope heterogeneity test, the study employed the Augmented Mean Group (AMG) and Common Correlated Effect Mean Group (CCEMG) panel time series estimator. For each model in the study, the Root Mean Squared Error (RMSE) was used to determine the best estimator of the two. Among other observations, the study revealed that the specified measures of risk financing such as insurance premium paid, assets pledged as collateral to the Central Bank of Nigeria and investment in Treasury bills exhibit mixed influence on each of the specified measures of financial performance.

Keywords: Risk Financing, Risk Hedging, Risk Diversification, Risk Transfer, Financial Performance

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[1] Prof. Dr., University of Lagos, Faculty of Management Sciences, Department of Actuarial Science and Insurance, mobalola@unilag.edu.ng, https://orcid.org/0009-0008-6213-9784

[2] Ms., Lagos State University, Faculty of Management Sciences, Department of Insurance, titilopefatima@gmail.com, https://orcid.org/0000-0001-7486-7019

I. INTRODUCTION

The present-day approaches to risk differ across organisations and the world, as business leaders no longer view risks as mere hazards to be avoided but also as opportunities that should be exploited. Eliminating risk is impossible for a business unit but the possibility and quantum of loss can be reduced by adjusting some circumstances relating to the loss. The business of Banks is to bear the risk for a predetermined price. The banking risk is referred to as a collection of speculative risks that emanate from the financial activities of the bank (Bojinov, 2016).

Risk in the banking sector is the possibility of a decrease in economic benefit in the event of a financial loss or loss relating to the operations and activities of a bank (Gunduz, 2020). The banking system exists as a medium through which funds are mobilized from the excess and channeled to the deficit unit of the economic system (Inegbedion, Bello & Obadiaru, 2020). According to the economic theory; there are two units (the surplus unit and the deficit unit). These units use the financial institutions as intermediaries (the bank is an integral part) to transfer funds to each other. The deposit money banks are part of this process as lending is a major service provided to its customers. The banking sector is a significant source of finance as the mainstream of finance is carried out through banks; the mainstream financial needs of the world's leading companies are fulfilled through the assistance of the banks (Bagh et al., 2017).

Channeling funds from one economic unit to another poses some inherent risks such as Credit risks, Foreign exchange risks, Operational risks, Interest rate risks, Liquidity risks, Legal risks, etc. Financial institutions especially banks are faced with many challenges concerning management of daily risks despite the tremendous growth in the sector. These daily risks include the decline in asset quality that relates to an increase in credit risk that affects expected profits, market risk that is generated from the fluctuation of interest rate and foreign exchange rate which impacts returns since banks accept financial instruments that are exposed to market price volatility as collateral for loans; also, liquidity risk that arises due to mismatch of assets and liabilities as well as recessionary economic conditions, not excluding operational risk which generates losses due to high cost (Ugwu & Nwakoby, 2020). However, Banks have to device a means to cope with all of these various risks in the course of their operations.

Risk management is one of the reliable and essential instruments for financial institutions (such as the bank). Risk management involves the identification, assessment as well as prioritization of risks in conjunction with the coordination and economic application of available resources to minimize, control, and monitor the prospect or impact of undesirable or unwanted events in a business (Bagh et al., 2017). The risk management process involves two major areas that are intricately bounded; the first is the identification and analysis of exposures while the second is the treatment of exposures through some forms of risk management techniques (Colaizzo, 2009). Risk exposure can either be economically treated through risk control or risk financing. The inadequacy of risk treatment through risk/loss control, informed the treatment of risk exposure through some form of risk financing. Risk financing addresses the problem of aligning an organisation's willingness to take risks (risk appetite) with its ability to do so within the context of the organisation's objective. Risk financing simply means the adequate and efficient use of funds to cover the financial effect of unexpected losses or to cover the cost related to unforeseen adverse events. However, financial institution manages risks that are associated with their ordinary course of business by making provisions for risk financing through diversification, hedging, transferring, or sharing (Uwgu & Nwakoby, 2020).

Adeusi, Akeke, Adebisi, and Oladunjoye (2013) strongly proposed that a sound risk management strategy is unavoidable for the competitiveness and survival of banks. However, for many years, the failure of risk management in prominent corporations, especially in the financial sector have been captured in the headlines. Many at times these failures resulted from corporate governance failures, where the executives of the organisation failed to fully identify and manage the risks that the companies were taking or possibly engaging in reckless risk-taking or involved in deficient risk management systems (OECD, 2014).

Some past studies carried out were centered on risk analysis, attempting to address the issue of risk management by providing various techniques for the different types of risk. Studies such as (Bagh et al, 2017; Uwiugbe, Uwuigbe&Oyewo, 2015, Adeusi, Akeke, Adebisi &Oladunjoye, 2014; Kaaya & Pastory, 2013; Kolapo, Ayeni & Oke, 2012; Khizer, Muhammed & Sharma, 2011 to mention a few) focused on credit risks while (Olusanmi, 2015; Misker, 2015; Omondi, 2015; Kenny, Jumoke & Faderera, 2014 and Ugwu, 2020 to mention a few) focused on market, liquidity and operational risk. All of these researchers in their studies identified measures for treating the various identified types of risks faced by financial institutions and recommended risk management as a means for managing these risks

but emphasis has not been made on how the treatments affect the performance of these financial institutions. Prior studies did not seek to examine the effect of risk financing which is an integral part of risk management, and one of the determinants of a successful risk management strategy on financial performance. Hence, this study examines the influence of risk financing on the financial performance of selected deposit money banks in Nigeria by examining; the influence of risk transfer on the profitability of deposit money banks in Nigeria; the influence of risk hedging on the liquidity of deposit money banks in Nigeria; and the influence of risk diversification on shareholder's value in deposit money banks in Nigeria.

To achieve the research objectives above, tentative statements were made and tested to validate the statements and proffer responses to the research questions. The statements are as follows;

H01: Risk transfer does not have a significant influence on the profitability of deposit money banks in Nigeria.

H02: Risk hedging does not have a significant influence on the liquidity of deposit money banks in Nigeria.

H03: Risk diversification does not have a significant influence on shareholder value in deposit money banks in Nigeria.

II. LITERATURE REVIEW

The essence of risk management is not to reduce risk, but rather to add value through the management of risk. A balanced approach to risk management means taking on the risk appropriate to the organisation's financial and competitive position as well as the financial goals and objectives of the board and management of the organisation (Epstein et al., 2014). The risk management process is incomplete without risk treatment; choosing the best economic technique to treat risk is as important as identifying the risk exposures. In formulating a risk management plan or strategy the risk manager must painstakingly evaluate the potential loss in terms of the frequency of adverse events and the severity of their financial consequences; this analysis is the basis for determining the most appropriate risk financing option.

Risk financing is simply the utilization of funds to cover the financial effect of unexpected losses. The sources of funds may be internal or external to the organisation. However, the decision on the best approach to risk financing is based on the cost efficiency,

financial stability and security, and the control over programme administration each method affords an organisation (Colaizzo, 2009). Risk financing can either be through retention or transfer. Risk transfer transmits an organisation's risk to an outside party. The most commonly used risk transfer technique is through commercial insurance; although risk transfer can also be achieved through non-insurance techniques such as risk diversification, hedging, non-insurance transfer/agreement, risk sharing, and many more (Ugwu & Nwakoby, 2020; Colaizzo, 2009).

According to Fadun (2013), Jemil et al., (2010), and Jarvis (2009) insurance is a suitable strategy for managing risk in the Nigerian banking industry. Not all risks are insurable because insurance is limited to risks where the prospect of loss can be calculated or the contingent cost of insurance exposure can be reasonably estimated (Steven, 2017). Risk diversification, on the other hand, is a technique that minimizes risks by allocating investments among various financial instruments, industries, and other categories (Ugwu & Nwakoby, 2020). Risk diversification is a method of risk financing through transfer whereby an organisation reduces the risk of a portfolio by having a mix in its investments. It involves a process in which capital is allocated in a way that exposure to any one particular asset or risk is reduced. This is done to maximize returns by investing in different areas that would each react differently to the same event. Risk diversification ensures that profit losses are minimized and the organization is protected from hitting rock bottom as funds are spread across different assets or sectors such that turbulence in one area won't impact another (Bojinov, 2016). Risk hedging is also another risk financing technique used to reduce exposure to risk investment or risk in investment as it deals with the reduction of fluctuations in investment prices and locks profit therein. Hedging works on the principle of offsetting, that is, taking opposite and equal stands in two different markets. According to Adam (2019), risk hedging is a technique used to protect capital against inflation through investment in high-yield financial instruments such as (bonds, notes, shares, etc.), real estate, or precious metals. Several techniques and financial instruments are available to an investor to hedge risk with, some of these are; option contracts, futures contracts, short selling, investments in currencies, investments in commodities, and investments in other assets or derivatives (James, 2013). Basically, according to Ugwu&Nwakoby (2020), hedging techniques are grouped into Futures, Forwards, Swaps, and Options. However, according to Bojinov (2016), banks hedge risks through various financial instruments, which create an alternative financial flow with opposite directions and the size of potential losses on the realization of the hedged risk.

Markowitz (1952) posited that by understanding the differences and similarities between investments, a more efficient portfolio will be built to maximize a certain level of risk and return. Markowitz (1991) advanced the Portfolio theory which developed into the Modern Portfolio Theory. The Modern Portfolio Theory is an investment framework for the formation and selection of investment portfolios based on the maximization and minimization of expected returns of the portfolio and the investment risk respectively (Fabozzi, Gupta, & Markowitz, 2002). According to Markowitz (1952), the portfolio is the collection of securities, and uncertain returns (risky) but one needs to establish what portfolio to own. Hence, in a portfolio, investments should be selected based on their correlation to other assets. Correlation, however, is a mathematical term that describes the movement of the price of one asset and its relationship with the total value of the portfolio. According to Markowitz investors should estimate the expected returns and standard deviation of each portfolio and make portfolio decisions only on this basis. This theory requires that an investment starts with a risk-free asset, and then adds a diversified risky asset that will yield an efficient portfolio with minimum risk and maximum return. In essence, the deposit money banks in Nigeria have to weigh up the risk-return effect of any risk financing technique before adoption to ensure the expected result of implementing the risk management strategy is achieved.

Some deposit money banks have collapsed in Nigeria due to failed credit risk management and other corporate governance issues (Kafidipe et al., 2021). The enormous existence of non-performing loans that are being carried over on a yearly basis by the banks and default risks resulting from poor credit risk management contribute to the failure or collapse in the sector; recording about a total of 53 banks liquidating between the periods of 1994 to 2018, with non-performing loans exceeding 200 billion Naira in Nigeria (Nweze, 2012; NDIC, 2022).

According to Audu (2014), the Nigerian financial sector lacks some elements of risk management, such as the absence of basic mechanisms for controls, weak corporate governance, excessive exposure to credit, weak disclosure of finance and openness. All of these collapses and problems brought the spotlight on risk management in the banking sector.

A study by Ugwu & Nwakoby (2020) on the empirical study of corporate risk management on financial performance focused on the Nigerian sector. The study purposively sampled 15 banks and gathered data from the annual reports of the selected banks for a period of 10 years (2010-2019), the study proxy financial performance using return on assets and

corporate risk management using risk diversification, risk hedging, and risk transfer. Data was analyzed using the Pearson correlation and regression. The study concluded that risk diversification, hedging risk, and risk transfer in fraud risk management have a significant positive effect on the return on assets of listed banks in Nigeria. The study limited the risk management investigation to fraud risk management which is a minute fraction of the numerous risks the banking sector is faced with. The study was not holistic in its approach and the measurement of financial performance using only return on assets is insufficient.

Also, Inegbedion, Bello, and Obadiaru (2020) carried out a study on risk management and the financial performance of Banks in Nigeria. The study employed panel data from 5 cross sections for 8 years (periods between 2010 -2017), the study did not state the basis for selecting five (5) banks that were observed in this study. Financial performance was measured using Return on Asset and Return on Equity, and risk management was measured using major risk indicators and their ratios such as credit risk, leverage risk, and liquidity risk. The study observed both short-run and long-run effects of the risk management indicators on financial performance. It was concluded that adequate risk management especially for liquidity risk, leverage risk, and credit risk will improve the financial performance of banks in Nigeria. This study focused on the effect of the risk occurrences on financial performance leaving out the effect of the treatments of the risks which is the essence of risk management. Studies of Kolapo, Ayeni and Oke (2012); Ayodele and Alabi (2014) on risk management in the banking sector also focused on the identification and assessment of various risks faced by banks in Nigeria.

From the review of the literature, it was observed that most of the research in existence focused more on the identification and assessment of risk faced by banks in Nigeria. Identification of problems and suggestion of solutions is not enough to say a problem has been solved, implementing the solution and observing how the solution has improved the situation is very vital. Hence, this study is focused on investigating the effect of risk financing methods through various risk transfer mechanisms on the financial performances of deposit money banks in Nigeria. The financial performance of the banks is examined beyond the return on assets and return on equity covered by prior studies.

III. DATA AND METHODOLOGY

The essence of risk management is not to reduce risk, but rather to add value through the management of risk. A balanced approach to risk management means taking on the risk

appropriate to the organisation's financial and competitive position as well as the financial goals and objectives of the board and management of the organisation (Epstein et al., 2014). The risk management process is incomplete without risk treatment; choosing the best economic technique to treat risk is as important as identifying the risk exposures. In formulating a risk management plan or strategy the risk manager must painstakingly evaluate the potential loss in terms of the frequency of adverse events and the severity of their financial consequences; this analysis is the basis for determining the most appropriate risk financing option.

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$$ROA = a + b_1 RPPD + b_2 MREH + b_3 INVTB + b_4 TA + e \ldots\ldots \text{ Model 1}$$

$$\text{LR} = a + b_1 RPPD + b_2 MREH + b_3 INVTB + b_4 TA + e \ldots\ldots\ldots \text{Model 2}$$

$$ROE = a + b_1 RPPD + b_2 MREH + b_3 INVTB + b_4 TA + e \ldots\ldots\ldots \text{ Model 3}$$

Table I. Definition of variables in the model

Variables	Description	Unit	Data Source
Return on Asset (ROA)	Measures Profitability, calculated as net income divided by total asset	Percentage (%)	Financial Statements of Selected Banks
Liquidity Ratio (LR)	Measure Liquidity, calculated as current assets divided by current liabilities	Percentage (%)	Financial Statements of Selected Banks
Return on Equity (ROE)	Measures Shareholder's value, calculated as net profit divided by total equity	Percentage (%)	Financial Statements of Selected Banks
Risk Premium Paid (RPPD)	Measures risk transfer , Logarithm of insurance premium paid	Logarithm of Naira	Financial Statements of Selected Banks
Market Risk Exposure Hedged (MREH)	Measures risk hedging, Logarithm of financial assets pledged as collateral with the central bank	Logarithm of Naira	Financial Statements of Selected Banks
Investment in Treasury Bills (INVTB)	Measures risk diversification, calculated as investments in treasury bills divided by total investment portfolio	Percentage (%)	Financial Statements of Selected Banks
Total Asset (LogAsset)	Control Variable, the logarithm of total assets	Logarithm of Naira	Financial Statements of Selected Banks

In line with the empirical data structure, the study employed the panel data methodology. Thus, empirical data analysis phases sequentially include preliminary analysis, model estimation stage and post diagnostic tests. The first-stage analysis is conducted to evaluate the statistical properties of the empirical data. Thus, the preliminary analysis includes primarily the descriptive analysis and pre-estimation tests. The descriptive analysis provides the summary statistics (such as mean, maximum, minimum, skewness, kurtosis and Jarque-Bera statistic) of the panel series being examined. The pre-estimation tests include multicollinearity test (using variance inflation factor), cross-sectional dependence (CD) test using Pesaran testing method, panel unit root test and panel cointegration test and the slope heterogeneity test. Based on the CD test results, the study employed both the first generation (FG) panel unit root test, which does not take into account cross-sectional dependence in the concerned panel series and the second generation (SG) panel unit root test which accounts for cross-sectional dependence in the concerned panel series. As a result, the Im, Pesaran and Shin (IPS) testing procedures was employed for FG panel unit root test while Cross-sectionally Augmented IPS (CIPS) test was employed to capture the presence of cross-sectional dependence. Similarly, to account for presence of cross-sectional dependence, the Westerlund testing methodology was employed to conduct the cointegration test following the panel unit root test results.

In line with the pre-tests, such as the CD test, unit root test and slope heterogeneity test, the study employed the augmented mean group (AMG) and common correlated effect mean group (CCEMG) estimators following the presence of cross-sectional dependence (CD) among the selected entities (banks) demonstrated in the empirical data. Both aforementioned estimators are non-error correction forms. Meanwhile, the choice between the aforementioned competing estimators is determine by root mean squared error (RMSE) for each of the models. All estimation processes involve natural logarithm of the variables. In other words, the estimation involves double-log specification.

IV. RESULT AND DISCUSSION

The descriptive analysis of the specified variables such as the return on asset, liquidity ratio, return on equity, insurance premium, asset pledged, investment in Treasury bill, and total asset were presented in Appendix 1. It revealed that the average values of the return on asset, liquidity ratio, return on equity, insurance premium, asset pledged, investment in Treasury bill, and total asset of selected banks are 3.69, 186, 13.85, 6.29, 7.93, 0.56, and 9.13

percent respectively. Also, the Jarque-Bera statistics and their probability for all the specified variables have probability values of 0.00, which implies that the data set does not exhibit a normal distribution trend as statistics values were far from normal at a 5% probability level. Thus, to explain the exact characteristic of the data used in the study, the study tests for stationarity by conducting panel unit root test.

Furthermore, the Variance inflation factor (VIF) was used to examine the extent of multicollinearity among the policy variables under investigation. The variance inflation factor (VIF) shows how much any collinearity between the explanatory variables may amplify the variance of the estimates of that explanatory variable. The VIFs and the tolerance (1/VIF) among the explanatory variables are displayed in Appendix 2. A variance inflation factor below the VIF coefficient of 10 (benchmark) indicates low level of multicollinearity among the variables. Therefore, all the VIF coefficients are less than 10, thus, suggesting that there is low degree of multicollinearity (low relationships) among the explanatory variables for each of the models. Overall, the mean of the VIFs is less than the threshold.

Hence, to determine whether or not the selected banks had any unobserved common factor, the cross-sectional dependency (CD) test was performed. The Pesaran type was employed for the CD test. The null hypothesis of the CD test is that there is no cross-sectional dependence among the chosen entities. The results of the CD test utilizing the Pesaran testing type are shown in Table 2. It is evident that there is cross-sectional dependence (interdependence or common shocks) among the selected banks through return on equity and total asset for each of the models following the significant test results (i.e., having the p¬-values less than 0.05). The foregoing suggests the impulses or shocks to any of the selected banks are likely to spread to others. However, no cross-sectional dependence observed among the selected banks through other variables following the insignificant test results (i.e., having the p¬-values above than 0.05).

The panel unit root was performed to ascertain whether the panel variables being investigated were stationary. Based on the CD test results, the study employed both the first generation (FG) panel unit root test and the second generation (SG) panel unit root test. As a result, the Im, Pesaran and Shin (IPS) testing procedures was employed for FG panel unit root test while Cross-Sectionally Augmented IPS (CIPS) test was employed to capture the presence of cross-sectional dependence. The CIPS test is the revised version of the Im,

Pesaran and Shin (IPS) test for cross-sectional independence. The test conducted provided the test statistics (CIPS) and the corresponding critical values.

Table II. Cross Sectional Dependence and Panel Unit Root Test Results

	CD	IPS		CIPS	
Variables		**Level**	1st Diff.	**Level**	1st Diff.
ROA	0.170	-2.935**	-	-	-
LR	1.130	-2.795***	-	-	-
ROE	4.430***	-	-	-2.353	-3.056***
RPPD	0.290	-3.044**	-	-	-
MREH	1.350	-1.438	-2.395*	-	-
INVTB	-0.280	-2.176	-3.149***	-	-
TA	2.430***	-	-	-2.055	-3.330***

*Note: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. CD stands for cross-sectional dependence, IPS refers to the Im, Pesaran, and Shin unit root test, and CIPS represent the Cross-Sectionally Augmented IPS test.*

Using the IPS test type ROA, LR and RPPD appear to be level-form stationary i.e., integrated of order zero while MREH and INVTB demonstrate first-difference-form stationary process i.e., integrated of order one. On the other hand, using the CIPS test type for the second-generation test, both ROE and TA appear to be first-difference-form stationary i.e., integrated of order one. The forgoing suggests that panel unit root test yielded combination of order of integration, I(0) and I(1) for each of the models judging by the IPS and CIPS test statistics. Thus, the unit roots result indicates the use of heterogeneous dynamic panel estimation methods.

Following the panel unit root test result, a cointegration test was conducted to determine if the variables under investigation had a long-run relationship or not. With cross-sectional dependence, the Westerlund (WEST) cointegration test technique was employed. Similarly, the WEST is second generation cointegration test method that accounts for cross-sectional dependence among the selected banks.

Table III. Westerlund Cointegration Test Result

Model	**Test Statistics**
ROA	2.3280***
LR	2.4834***
ROE	1.9091***

*Note: *** , **and * symbolize statistical significance at 1%, 5% and 10% levels respectively.*

The Table 3 above presents the results of cointegration test using the WEST cointegration test procedure. As shown in the Table, the variance ratio statistics of the test are significant (i.e., having p-values less than 5 percent), thus, suggesting that there is existence of long run relationship among the variables for each of the models.

Prior to the model estimation, it is essential to determine whether the slopes of the selected banks are homogenous or heterogeneous. The slope heterogeneity test, proposed by Peasaran and Yamagata (2008), were employed. The test is based on the null hypothesis that 'slope coefficients are homogenous'. The foregoing suggests that all slope coefficients across cross-sectional units are identical.

Table IV. Slope Heterogeneity Test Result

Model	Delta (δ)	Adj. Delta
ROA	0.2360	0.3500
LR	0.3720	0.5510
ROE	0.9400	1.3950

The Table 4 displays slope heterogeneity the results. The test statistics indicate that the ROA model ($\delta = 0.236$, $p = 0.813$; adj. $\delta = 0.350$, $p = 0.726$), LR model ($\delta = 0.372$, $p = 0.710$; adj. $\delta = 0.551$, $p = 0.581$) and the ROE model ($\delta = 0.940$, $p = 0.347$; adj. $\delta = 1.395$, $p = 0.163$) demonstrate homogenous long-run slope coefficients having insignificant test statistics. Thus, same slope coefficients are considered across the selected banks.

Model Estimation and Results

Following the pre-tests results, such as the CD test, unit root test and slope heterogeneity test, the study employed the panel time series estimators or dynamic heterogeneous panel estimators. Specifically, the study employed the augmented mean group (AMG) and common correlated effect mean group (CCEMG) estimators following the presence of cross-sectional dependence (CD) among the selected entities (banks) for each of the models demonstrated in the empirical data. Meanwhile, the choice of use between the aforementioned competing estimators is determine by root mean squared error (RMSE) for each of the models.

ROA Model

This model captures the nexus between risk financing and profitability (using return on asset as a measure). Table 8 shows the summary of the estimates and statistics obtained from estimation of the ROA model using the above-mentioned estimators (AMG and

CCEMG). As displayed in Table 8, it could be observed that between the two competing estimator, the CCEMG estimator is considered more efficient having the lower RMSE value (0.1157) as compared to that of AMG (0.3810). Following the foregoing, the selected estimator was used in making inferences on ROA model.

As shown in Table 5, the tests of individual significance are given by the individual coefficients and the resultant p-values (in parentheses). Under the CCEMG estimator, it could be observed that changes in INVTB ($\beta\_3 = 0.3976$, $p = 0.043 < 0.05$) exert positive and statistically significant effect on return on asset (ROA) as a measure of financial performance of the selected banks in Nigeria. Thus, the statistical significance status of the foregoing empirical test indicates the rejection of the null hypotheses, i.e., $H\_0: \beta\_3=0$ is rejected However, changes in RPPD ($\beta\_1 = -0.3431$, $p = 0.569 > 0.1$) and MREH ($\beta\_2 = 0.3345$,$p = 0.293 > 0.1$) exerted, respectively, negative and positively, however, insignificant effect on return on asset (ROA) as a measure of financial performance of the selected banks in Nigeria. Thus, the statistical significance status of the foregoing empirical tests indicates the retention of the null hypotheses, i.e., $H\_0: \beta\_1=0$ and $H\_0: \beta\_2=0$ are retained.

Table V. Panel Model Estimation Results for ROA Model

Dependent Var.	**ROA**	**ROA**
Estimator:	**AMG**	**CCEMG**
Independent Variable		
Intercept	29.3651*** (0.155)	-33.859 (0.206)
RPPD	0.0780 (0.486)	-0.3431 (0.569)
MREH	-0.0772 (0.437)	0.3345 (0.293)
INVTB	0.2148*** (0.001)	0.3976** (0.043)
TA	-1.0730*** (0.007)	0.4450 (0.527)
Further Statistics and Tests		
RMSE	0.3810	0.1157
Overall Test:		
Wald test (chi-square)	20.170*** (0.0005)	25.100*** (0.000)

***Note*:** The values in the parentheses**()** are *p*-values of the respective coefficients and statistics while ***, ** & * denote statistical significance at the conventional 1%, 5% and 10% levels of significance, respectively.

Meanwhile, changes in bank size (*TA*, $\beta_4 = 0.7465$, $p = 0.527 > 0.1$) exert statistically positive and insignificant effect on return on asset of the selected banks in Nigeria.

LR Model: This model captures the nexus between risk financing and liquidity (using liquidity ratio as a measure). Table 6 shows the summary of the estimates and statistics obtained from estimation of the LR model using the above-mentioned estimators (AMG and CCEMG). As shown in Table 6, it could be observed that between the two competing estimator, the CCEMG estimator is considered more efficient having the lower RMSE value (0.000) as compared to that of AMG (0.7494). Following the foregoing, the selected estimator was used in making inferences on LR model.

As shown in Table 6, the tests of individual significance are given by the individual coefficients and the resultant *p*-values (in parentheses). Under the CCEMG estimator, it could be observed that changes in *MREH* (β_2 = 0.5873, p = 0.007 < 0.01) exert positive and statistically significant effect on liquidity (*LR*) as a measure of financial performance of the selected banks in Nigeria. Thus, the statistical significance status of the foregoing empirical test indicates the rejection of the null hypotheses, *i.e.*, $H_0: \beta_2 = 0$ is rejected However, changes in RPPD (β_1 = 0.0090, p = 0.986 > 0.1) and INVTB (β_3 = -0.0797,p = 0.915 > 0.1) exerted, respectively, negative and positively, however, insignificant effect on liquidity (*LR*) as a measure of financial performance of the selected banks in Nigeria. Thus, the statistical significance status of the foregoing empirical tests indicates the retention of the null hypotheses, *i.e.*, $H_0: \beta_1 = 0$ and $H_0: \beta_3 = 0$ are retained.

Table VI. Panel Model Estimation Results for LR Model

Dependent Var.	**LR**	**LR**
Estimator:	**AMG**	**CCEMG**
Independent Variable		
Intercept	-3.5256 (0.878)	-9.4730 (0.862)
RPPD	-0.3425*** (0.020)	0.0902 (0.989)
MREH	0.0410 (0.921)	0.5873 (0.007)
INVTB	-0.3434* (0.062)	-0.0797 (0.915)
TA	0.6288 (0.534)	-5.3975 (0.013)
Further Statistics and Tests		
RMSE	0.7494	0.0000
Overall Test:		
Wald test (chi-square)	56.080*** (0.000)	13.380*** (0.000)

***Note*:** The values in the parentheses**()** are *p*-values of the respective coefficients and statistics while ***, ** & * denote statistical significance at the conventional 1%, 5% and 10% levels of significance, respectively.

Meanwhile, changes in bank size (*TA*, β_4 = -5.3975, p = 0.013 < 0.05) exert statistically negative and significant effect on liquidity (*LR*) of the selected banks in Nigeria

ROE Model: This model captures the nexus between risk financing and shareholder value (using return on equity as a measure). Table 7 shows the summary of the estimates and statistics obtained from estimation of the ROE model using the above-mentioned estimators (AMG and CCEMG). As shown in Table 7, it could be observed that between the two competing estimator, the CCEMG estimator is considered more efficient having the lower RMSE value (0.000) as compared to that of AMG (0.3247). Following the foregoing, the selected estimator was used in making inferences on LR model.

As shown in Table 7, the tests of individual significance are given by the individual coefficients and the resultant *p*-values (in parentheses). Under the CCEMG estimator, it could be observed that changes in *MREH* (β_2 = 4.3462,p = 0.021 < 0.05) exert positive and statistically significant effect on return on equity (*ROE*) as a measure of financial performance of the selected banks in Nigeria. Thus, the statistical significance status of the foregoing empirical test indicates the rejection of the null hypotheses, *i.e.*, $H_0: \beta_2 = 0$ is rejected However, changes in RPPD (β_1 = 1.2784, p = 0.728 > 0.1) and INVTB (β_3 = 0.0421,p = 0.993 > 0.1) exerted positive, however, insignificant effect on return on equity (*ROE*) as a measure of financial performance for shareholders' value of the selected banks in Nigeria. Thus, the statistical significance status of the foregoing empirical tests indicates the retention of the null hypotheses, *i.e.*, $H_0: \beta_1 = 0$ and $H_0: \beta_3 = 0$ are retained.

Table VII. Panel Model Estimation Results for ROE Model

Dependent Var.	**ROE**	**ROE**
Estimator:	**AMG**	**CCEMG**
Independent Variable		
Intercept	-1.6100 (0.533)	48.6675 (0.826)
RPPD	0.1406 (0.174)	1.2784 (0.728)
MREH	0.1112 (0.142)	4.3462*** (0.021)
INVTB	0.1226* (0.075)	0.0421 (0.993)
TA	0.0019 (0.989)	-8.1174 (0.512)
Further Statistics and Tests		
RMSE	0.3247	0.0000
Overall Test:		
Wald test (chi-square)	8.060* (0.0895)	15.860*** (0.0496)

***Note*:** The values in the parentheses**()** are *p*-values of the respective coefficients and statistics while ***, ** & * denote statistical significance at the conventional 1%, 5% and 10% levels of significance, respectively.

Meanwhile, changes in bank size (*TA*, β_4 = -8.1174, p = 0.512 > 0.1) exert statistically negative and significant effect on return on equity (*ROE*) of the selected banks in Nigeria.

The result revealed that the specified measures of risk financing such as insurance premium paid, assets pledged as collateral to the Central Bank of Nigeria and investment in Treasury bills exhibit mixed influence on each of the specified measures of financial performance. From the results above it was observed that; a unit change in insurance premium paid will result in a decline in return on assets while similar changes in investment in treasury bills and asset pledged will yield an increase in return on assets. This implies that as firms channel funds into pledges and treasury bills it will help them attain improved performance while such investment in premium will have an inverse influence on performance measured using the return on assets. Similarly, the result revealed that using liquidity ratio as a measure of performance against risk financing measures such as insurance premium paid, asset pledged to Central Bank and investment in treasury bills revealed that a unit change in asset pledged to Central Bank and investment in Treasury bill will result into an increase in the liquidity of banks under observation while insurance premium paid will result to a slight decrease in liquidity of the banks. This implies that as the bank channel more funds into asset pledges and investments in treasury bills it will help them attain improved liquidity in the long run. Also, the result revealed that using return on equity as a proxy for performance against the specified measures of risk financing such as insurance premium paid, asset pledged to Central Bank and investment in Treasury bill revealed a unit change in insurance premium paid, asset pledged and investment in Treasury bill will result in an increase in return on equity. This implies that as firms channel funds into assets pledged, insurance premium paid, and investment in Treasury bills it will help them attain improved performance, although the increase in performance might not be statistically significant with insurance premium paid and investment in Treasury bills. Equally, risk transfer mechanisms such as insurance, often influence a bank's performance by aiding management and mitigation of risks, as its effective utilization enhances stability and often leads to increased financial performance. Thus, the influence of alternative risk financing mechanisms on bank performance is complex and depends on factors such as the bank's investments in short-term and diversified investments.

V. CONCLUSION

Insurance as a means of risk treatment by the banks indicates a negative effect on return on asset and liquidity, this may be as a result of the opportunity cost foregone on the cost of premium paid to insurance companies for the coverage. Although, insurance indicates a positive effect on shareholders' value which might be as a result of the support and confidence having insurance coverage give the banks to involve in some business activities without the fear of some adverse events. These findings are slightly in contrast with the observation of Fadun (2013) that insurance enhances bank operations in the Nigerian banking sector. Also the negative effect of insurance observed in this study may be as a result of the restriction of insurance to covering only pure risks. Risk diversification measured using Investment in Treasury bills has a positive influence on profitability measured using the Return on Asset is in affirmation with the study of Ugwu & Nwakoby (2020). Also, investment in Treasury bill has positive effects on all three measures of performances in this study; this might be as a result of the return on investment and the securitization of investments. Asset pledged to Central bank measuring risk hedging has significant positive effect on the three measures of performance; this is in contrast with the study of Nguyen (2015) who discovered that risk hedging does not have a significant effect on the increase in value increment of a company. Asset pledged also has regulatory compliance effect on the bank. The banks resort to these fund when they are in distress as the central bank is the bank for bankers and provides succor to banks.

All these observations confirm the need to make a trade-off and a portfolio decision in line with the modern portfolio theory. The banks have to do a cost-benefit analysis for each of the available risk financing techniques and also explore other alternatives for treating risk in order to manage risks profitably and maximize the opportunities in risk situations. Insurance as a means of treating risk might have to be re-examined by banks in Nigeria; insurance covers majorly pure risk which mostly arise as physical risk (operational risk), better risk control measures and intentional retention might be adopted by banks to reduce the cost of premium paid for insurance coverage.

Regardless of the contributions of this study, there exist some limitations. The observation of this study is limited to the banking sector and specifically to the deposit money banks licensed to carry out business internationally because they are opened to a wider array of investment opportunities and different risk environments compared to banks limited to a

particular country or risk environment. Also, this study can be further expanded to examine banks with less expertise and experience. Other macroeconomic variables might be considered in line with the variables considered in this study as these macroeconomic variables may have some external controls.

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Appendix

Appendix I. Descriptive Statistics

	ROA	LR	ROE	RPPD	MREH	INVTB	TA
Mean	0.0369	186.186	0.1385	6.2940	7.9361	0.5639	9.1370
Median	0.0249	1.2096	0.1204	6.7427	7.8921	0.4053	9.30626
Maximum	0.5402	5069.62	0.6422	7.5227	9.1021	5.2694	10.0981
Minimum	0.0035	0.001345	0.0078	3.4752	6.1546	0.0050	8.11186
Std. Dev.	0.0646	718.1428	0.0950	1.1087	0.5639	0.7370	0.55779
Skewness	6.0855	4.864671	1.7988	-1.2516	-0.5469	3.8367	-0.57713
Kurtosis	44.722	28.81724	10.1733	3.2150	3.5060	22.002	2.22632
Jarque-Bera	6926.101	2791.03	236.132	23.14537	5.3259	1539.88	7.0799
Probability	0.000000	0.0000	0.0000	0.0000	0.0697	0.0000	0.0290
Observations	88	88	88	88	88	88	88

Appendix II. Variance Inflation Factor

Dependent Variables: ROA, LR & ROE		
Variable	**VIF**	**1/VIF**
RPPD	4.610	0.217
MREH	1.980	0.505
INVTB	1.610	0.620
TA	5.930	0.169
Mean VIF:	**3.530**	.