Int. j. adv. multidisc. res. stud. 2024; 4(6):1018-1027

Received: 27-10-2024
Accepted: 07-12-2024

International Journal of Advanced Multidisciplinary Research and Studies

ISSN: 2583-049X

Risks Management and Financial Performance of Deposit Money Banks in Nigeria

[1] Falade Samuel Shola, [2] Nyor Terzungwe, [3] Yahaya Adabenege Onipe, [4] Agbi Samuel Eniola

[1] Internal Control Division, United Bank for Africa Kenya Limited, 2nd Floor, Imperial Courts, Westlands, Kenya

[2, 4] Professor, Faculty of Management Sciences, Nigeria Defence Academy, Kaduna, Nigeria

[3] Associate Professor, Faculty of Management Sciences, Nigeria Defence Academy, Kaduna, Nigeria

DOI: https://doi.org/10.62225/2583049X.2024.4.6.3545

Corresponding Author: **Falade Samuel Shola**

Abstract

Risks management have continued to gain attention from various stakeholders and from financial regulatory compliance perspectives. The Basel accord, international standards setting bodies such as IFRS, and various country's central banks had at one time or the other formulated frameworks for the effective management of risks for banks and other financial institutions across the world. This study investigates the effect of risks management on financial performance of Banks in Nigeria by examining how the independent risk management variables of credit risk, market risk, liquidity risk and solvency risk has affected the financial performance of the deposit money banks in Nigeria. This study used the ex-post facto research design, utilising secondary data extracted from a sample of 12 banks covering a period of 10 years from 2013 to 2022 and adopted capital adequacy and firm's value as measurement for financial performance and thereafter, conducted a pooled OLS multivariate regression analysis. The result revealed that risks management variables have overall positive and significant effect on the financial performance measured with capital adequacy and firm's value of the bank. Findings also revealed that the price earnings ratio model which proxied firms value is a better predictor of financial performance and thus concludes that proper management of these risk elements would lead to better performance of the banks. Consequently, this study recommends that executive management of banks and financial regulatory bodies should ensure proper adherence to the risk management codes by the banks in other to achieve good financial performance.

Keywords: Risk Management, Financial Performance, Capital Adequacy, Firm Value, Price Earnings Ratio

JEL Codes: G110, G320

1. Introduction

The banking industry play very important roles in the economic evolution of any nation as the strength and sustainability of any economy cannot be divorced from the wellness and robustness of the banking sector. The banking sector perform roles such as mobilisation of funds in form of savings and deposits, availment of credits to area of shortfalls in the economy, ensuring a reliable system for payment and settlement, provision of bank's guarantees and facilitation of international trades. These roles among others had naturally configured the environment in which banks operate to be a complex network of risks that require adequate and appropriate management thereby emphasizing the criticality of effective risk management structure to the survival and financial performance of the banking sector, which is the focus of this study.

The first quarter of year 2023 saw an alarming collapse of three systemically important banks in the USA namely the First Republic Bank (FRB), Silicon Valley Bank (SVB) and Signature Bank (SB). These banks collapse, according to Karl *et al*. (2023) [38] were said to be the second, third and fourth largest banks failure in the history of United States since the global melt down of 2007 to 2009. Vidhura (2023) [67] reported that these banks took several uninsured deposits far above the usual $250,000 amount insured by the federal deposit insurance company (FDIC) and these deposits were locked up in fixed-interest long term forward deliverables. These three banks also focussed their assets on Cryptos, tech start-ups and investments that are very sensitive to price variations. Hence these banks, FRB, SVB and SB could not meet their immediate obligations to the

large depositors due to concentration risk, interest rate risk and liquidity risk thus leading to a bank run (Shinn, 2023; Vidhura, 2023) [61, 67] thereby affirming the importance of management of credit, market, liquidity and solvency risk on the financial performance of deposit money banks measured with their capital adequacy and firm's value.

Over the last three (3) decades, the Nigeria banks had also reported series of systemic weaknesses which may be attributed to banks failure resulting from ineffective risk management processes adopted by the banks. Various regulatory interventions had attempted to address the consequences of the poor risk management by introducing risk management codes that banks are expected to manage adequately. The CBN (2014) [17] introduced nine risks elements of Liquidity risk, Market risks, credit risks, operational risk, solvency risk, strategic risk, legal/ regulatory/compliance risk, counterparty risk and reputational risks as noted by Audu (2014) with the expectation that compliance with these risks element will assist in improving the performance of the banks.

Furthermore, the CBN announcement of the increment of the banks' capital requirement to N500 billions for banks with international authorisation, N200billion for national and N50 billion for banks with regional authorisation coupled with the revocation of banking licence of Heritage bank on 3rd June 2024 seems to suggest that the risk management framework implemented a decade earlier might not have produced the desired effect on the financial performance of the banks (Aduloju, 2024; CBN, 2024 [17]). It is against this backdrop that this study seeks to examine the effect of the management of credit risk, market risk, liquidity risk and solvency risk on the financial performance measured with capital adequacy and firm's value of the deposit money banks (DMBs) in Nigeria.

Some works which had specifically assessed the effectiveness of risk management on financial performance had arrived at varying results. For example, Okonkwo and Nwokeji (2018) [53] and Okere *et al* (2018) [52] which studied Credit risk management and financial performance of (DMBs) in Nigeria found that credit risk has significant positive effect on financial performance. Just as Adesina *et al* (2020) [1] and Igbinosa *et al* (2020) [35] which studied market risk and financial performance also noted a positive relationship. However, Kassi *et al* (2019) [40] found a negative but significant effect of market risk on financial performance. Meanwhile, Obi-Nwosu *et al* (2017) [48] found no significant relationship between market risk and performance. However, Muriithi and Waweru (2017) [45] found an overall negative and significant effect of liquidity risk on financial performance. While Përvetica and Ahmeti (2023) [57] and Toufaili (2021) [66] which reviewed the effect of solvency risk both found a positive and significant relationship with performance.

These varying result implies that studies in this field are still ongoing hence, this study seeks to understand the effect of risks management on the banks financial performance when measured with the dependent variables of capital adequacy and firm's value and independent variables of Credit Risk, Market Risk, Liquidity Risk and Solvency Risk, adapted from the CBN (2014) [17] framework by endeavouring to provide answer to the research question, what is the effect of management of credit risk, market risk, liquidity risk and solvency risk on the financial performance of the DMBs in Nigeria? While the main objective is the examination of the effect of risk management on the financial performance of DMBs in Nigeria. However, the specific objectives are to evaluate the effects of the management of credit risk, market risk, liquidity risk and solvency risk on the financial performance of the deposit money banks in Nigeria and to evaluate these objectives, the following hypotheses in the null form are formulated:

H_{01}: Credit risk management has no significant effect on the capital adequacy of (DMBs) in Nigeria
H_{02}: Market risk management has no significant effect on the capital adequacy of (DMBs) in Nigeria
H_{03}: Liquidity risk management has no significant effect on the capital adequacy of (DMBs) in Nigeria
H_{04}: Solvency risk management has no significant effect on the capital adequacy of (DMBs) in Nigeria
H_{05}: Credit risk management has no significant effect on the firm's value of (DMBs) in Nigeria
H_{06}: Market risk management has no significant effect on the firm's value of (DMBs) in Nigeria
H_{07}: Liquidity risk management has no significant effect on the firm's value of (DMBs) in Nigeria
H_{08}: Solvency risk management has no significant effect on the firm's value of (DMBs) in Nigeria

This study is of significance to various stakeholders such as investors who are highly concerned on the performance of their investments in the banks. They are keen to know how the executives' risks taking behaviours are affecting the performance of the banks in terms of shareholder's capital and the firm's value of their investment. It is also of significance to prospective investors who are concerned with the decision making on where to invest their funds as most investors are always sceptical of organisations that indulge in high risky behaviours as against those with better risk management attitude. It is also of importance to executive management who are interested in how their risk management behaviour is impacting the performance of the banks.

It is also of great importance to the employees of the banks especially those involved in risk management on the area of risk to watch out for as well as policy makers, law enforcement agencies and regulators such as the central Bank of Nigeria (CBN), Independent Corrupt Practices Commission, Asset management company of Nigeria (AMCON), Nigeria deposit insurance corporation and others vested with the monitoring and supervision of the activities of the deposit money banks in Nigeria by ensuring that their activities are in compliance with the laid down frameworks, identifying new and emerging risks and providing policy and procedural guidelines for the stakeholders in the banking industry.

The emphasis of this study is mainly on Nigerian deposit money banks with special attention on the effect of the four risk elements of credit risk, market risk, liquidity risks and solvency risks on the performance of the banks when specifically measured by with capital adequacy and firm's value of Nigerian DMBs, covering a period of 2013 to 2022. Further, this study is categorised into five sections where, section one introduced the study and section two focussed on the literature review. Section three discussed the methodology adopted while section four deals with data presentation, analysis and interpretation and finally closes with section five which discusses the findings, conclusion

and recommendation.

2. Literature Review

Risk can be described as a probability or threat of damage, injury, liability, loss, or any other negative occurrence that may be caused by external or internal vulnerabilities which may be avoided through pre-emptive action. This seems to perceive risk along the day to day general usage of the term. However, from finance perspectives, risk can be defined as likelihood that an actual return on an investment will be lower than the expected return (Business dictionary, 2017) [14]. Therefore, for the purpose of this study, risk can be defined as the probability of an event to cause loss which could be inherent within or outside an organisation. However, these potential losses may be prevented from crystallising to actual loses or ameliorated by definite, purposive and proactive risk management action.

Risk management can be defined as the art of managing risk through a deliberate, continuous, disciplined, approach for identifying, analysing, evaluating, monitoring, and controlling possible loss exposures to mitigate the adverse effect that may result from such risk if allowed to crystallise (ISACA, 2018) [36]. To achieve this, several frameworks had been designed to assist deposit money banks in the management of banks' risks to a tolerable level. One of such is the CBN (2014) [17] framework on risk management which had identified nine major risk elements that are inherent in the banking business activities. These risks are strategic risk, credit risk, market risk, operational risk, liquidity risk, counterparty risk, reputational risk, legal/regulatory/ compliance risk and solvency risk and had mandated deposit money banks in Nigeria to pay serious attention to the management of these risk. For the purpose of this study, four of the risks in the framework is considered namely: credit risk, market risk, liquidity risk, and solvency risk while the findings from the measurement of these risks element is taken as an indication of the risk management level employed by the banks under review.

Credit risk (CRR) is the possibility that a debtor may fail to meet his debt obligations as the credits given fall due which may have resulted from previously unidentified causes leading to debtor's insolvency. DMBs are therefore required to establish a comprehensive credit risk management system with adequate policies and procedures that will cover the credit strategies, administrations, analysis and controls (Aruwa & Musa, 2014; CBN, 2007; Ojo, 2010) [6, 16, 51]. Failure to pay proper attention to declining credit ratings of loan borrowers and poor loan portfolio management has been identified as the major cause of the huge non-performing loans that had led to several banks failure in Nigeria thus emphasising the import of proper credit risk management in the banks (Olawale *et al*., 2015) [54].

Market risk (MKR) also known as volatility risk is the risk from financial market forces due to fluctuations in demand, supply and prices in the financial market. These are the risks that has potentials to cause losses that may emanate from changes in the market variables such as foreign exchange rates, equities, interest rates, and other tangibles and intangible commodity prices. These risk may have serious effect on the balance sheet position of banks especially where there are volatilities in interest rates and exchange rates (CBN, 2007) [16]. A typical example is the current deregulation of the exchange rate regime introduce by the CBN with effect from June 2023 which had affected the various financial market indices in Nigeria. failure to properly manage this risk could lead to serious losses that could negatively affect the banks and impact shareholder's fund.

Liquidity risk (LQR) can be described as a risk resulting from funding crisis triggered by an unexpected situation warranting a huge debit against capital that has the potential to cause loss of confidence in the bank. Liquidity risk could also result from a nationwide crisis which if not properly handled could lead to a run off on the bank (Adeusi *et al*., 2013) [2]. liquidity risk occurs when a bank could no longer provide sufficient cash to meet all the forecasted and unpredictable cash requirements of the bank. A mismatch between assets and liability mix could result to uncertainties in the banks capacities to meet its cash obligation as and when due leading to liquidity risk (Santomero, 1997). Another cause of illiquidity is when an asset becomes unrealisable even when the financial institution ordinarily appears solvent hence banks are mandated by the apex regulatory body to implement a comprehensive liquidity risk management framework that covers the overall liquidity risk management strategy, policies and procedures which will detail the methods for liquidity risk identification, measurement, analysis and control to avoid the failure that may occur due illiquidity (CBN, 2007; CBN, 2014) [16, 17].

Solvency risk (SVR) also known as bankruptcy risk is that risk that may crystallise when an organisation or individual could no longer fulfil its financial obligations nor satisfy its debts obligation. This happens when there is no longer available cash flows sufficient enough to cover losses generated by all other kind of risks. In which case the capital base of the bank is no longer sufficient to write-off the value of the losses incurred by the banks. Such banks are said to be insolvent when it is recording a perpetual default in meeting debts obligations thus losing their franchise values (Almarzoqi *et al*., 2015) [3]. Consequently, banks are required to manage these risks in order to ensure good performance and business continuity of the banks.

The CBN (2007) [16] had earlier mandated Nigeria banks to ensure the implementation of an effective monitoring procedure to access the appropriateness and adequacies of the banks risk management strategies, review the risk management policies and procedures, efficiency and effectiveness of the monitoring process which must cover all kind of risks inherent in the banking business. The CBN (2014) [17] further require that DMBs must provide a periodic report of the various risks elements encountered in the day to day operation of the banks including new and emerging ones and the efforts towards the monitoring, controlling mitigating and resolution of such risks should be submitted on periodic basis. The report would also provide the summary of significant findings, breaches identified and resolution timeframe and status which should be reviewed by the board of directors and the risk management committee (RIMCO) set up by the banks.

Moreover, the CBN (2007) [16] also directed DMBs to establish an effective internal control system which will ensure the enforcement of official line of authorities, appropriate segregation of duties and the efficiency and effectiveness of laid down policies, procedures and processes. The bank officials assigned with the responsibility for this monitoring and controlling of risk should be independent of the functions they review. Further the internal audit process were also saddled with the

responsibility to assess and validate each step of the risk management process and technique which can be outsourced to external auditors or consultants.

However whether the service is carried out by an official of the bank or outsourced the following shall be given due consideration (i) the appropriateness of the DMBs risk measurement system put in place in line with the nature, scope and complexity of the banks processes and activities, (ii) the accuracy and integrity of the data being used for the purpose of the banks risk modelling, (iii) reasonableness of the scenarios and underlying assumptions adopted in building the risk models and (iv) the validation of the risk measurement computations which are to be clearly documented and reviewed periodically for update and relevance. All these were major requirements put in place by the DMBs apex regulatory body for the purpose of risk management in the banks.

Financial Performance: The index that quantifies the financial healthiness of an entity over a specific period of time which involves the up to date presentation of the outcome of an organisation's activities and operations in financial terms are referred to as financial performance. These financial performance metrics are also referred to as financial ratios which can be used to compare similar organisations from same industry as well as compare industries in aggregation (Farah *et al*., 2016). Financial ratios can show the relationship between financial data of the financial statements expressed as a quotient of two mathematical expressions (Abdulraheem, 2004). For the purpose of this study, firm's value and capital adequacy are the two measure of financial performance adopted.

Firm's value as a Measure of Performance: Firm's value can be defined as the total worth of an asset. It is an entity's net worth arrived at by aggregating its outstanding stocks in the market usually referred to as market capitalisation (Fidelity, 2017) [32]. Normally, firm's value is greater than a company's book value because firm's value captures both tangibles and intangibles such as goodwill, reputations, profitability, as well as prospective future growth.

There are several methods of computing the firm's value of a bank. Some scholars use Tobin's Q (Q- ratio), others use the price to book value (PBV) ratio. Yet others prefer the price to earnings ratio (PER). Tobin's Q is used to compute the firm's value of an entity in terms of its replacement value while the PER is normally measured as an aggregate of cost of equity, expected earnings growth and the pay-out Ratio (Jason, 2024) [37]. Meanwhile PBV is the measure of the market capitalisation of the entity to its book value. Therefore, the price earnings ratio (PER) is adopted for the purpose of this study, as it takes into account the value of the banks from the point of view of the investors.

Capital Adequacy Ratio as a Measure of Performance: Capital adequacy can be defined as the amount of capital necessary to be held by a financial institution in other to prevent the entity from becoming insolvent and also promote the safety and stability of the banking system as a whole. It is one of the important metrics of the safety, soundness, stability and solvency of banks by acting as a buffer to cushion or absorb losses. Capital adequacy is usually computed as a percentage of risk weighted average of its cumulative total credit exposures (Obiakor & Adeleke, 2016; Thumbi, 2014; Yaaba & Sanusi, 2020). Regulators mandated banks to maintain a level of capital adequate for the level of its activities usually referred to as regulatory capital.

CAR therefore measures the level of protection a bank has against excess leverage and insolvency by acting as a hedge during business difficulties and prevent banks' run. CAR matches a bank's capital with its current liabilities and its risk weighted asset. Meanwhile the risk weighted assets can be described as a measure of the amount of assets of a bank after adjusting for the various risks it carries (Obiakor & Adeleke, 2016; Thumbi, 2014; Yaaba & Sanusi, 2020). Thus for Nigeria DMBs, the CBN after its breakfast meeting with banks CEOs on 29th, January 2009 published a circular for the guidance of banks on the computation of the CAR which is the asset ratio of the total qualifying capital to the total risk weighted asset (CBN, 2009).

Previous reviews in the field of risk management and performance had identified some theories that are related to this study such as: Stewardship theory, stakeholder's theory, agency theory, moral hazard theory, business continuity theory, and risk versus returns trade off of modern portfolio theory. However, for the purpose of this study the stakeholder theory and the moral hazard theory were found to have more bearing to the study. Stakeholder theory is a theory of organizational management and business ethics that focused on morals and values in managing an organization. The theory proposed that successful managers despite the fact that they are faced with several risk and uncertainties must systematically focus on the interests of various stakeholder of the organization as there are other divers interest groups whose interest should be taken into consideration in managing the affairs of a corporate entity. Thus stakeholder's theory focus on maximising values for the benefits of the various stakeholders (Battilossi, 2003; Freeman, 1984; Klimczak, 2005). Meanwhile, Macey and Maureen (2003), further noted that managers should manage the company through various risks and uncertainties by taking decisions and actions that will benefit its stakeholders and to ensure their rights and their participation in decision making as well as act as the shareholder's agent to ensure the shareholders interest and the survival of the company is achieved and maintained.

Moral hazard theory describes a situation where managers and directors takes very high risk with the understanding that the consequences of taken such high risk where they crystallise to losses would not be borne by them but by other stakeholders such as deposit insurance companies or the owners and in some cases where there is anticipation of government bailouts. (Krugman, 2009; Omanufeme, 2013) [42, 55]. It is of note nevertheless that an effective and good risk management cannot be explained by just one theory but a combination of several of the theories. However, this study finds the stakeholders theory and moral hazard theory to have most bearing with the current review.

Okonkwo and Nwokeji (2018) [53] studied Credit risk management and financial performance of (DMBs) in Nigeria. The study adopted non-performing loans, non-performing loans to total loans ratio, non-performing loans to shareholders' fund, loan to deposit ratio together with Herfindahl Hirschman index as independent variables. The study used secondary data to conduct regression analysis. The finding from the study revealed that credit risk has significant positive effect on financial performance

measured with ROA. The study differs from the current study in the methods adopted to measure the IVs and adoption of ROA as the performance measurement matrix. Similarly, Okere *et al*. (2018) [52] studied credit risk management effects on performance of Nigeria DMBs using data from ten sampled banks to conduct panel regression analysis and Hausman test. The study found that credit risk management revealed a positive relationship between risk management and financial performance measured with ROA. However, the research only considered ROA as financial performance index thereby differs from this current study.

Adesina *et al* (2020) [1] studied market risk and financial performance proxied with price to earnings ratio of 20 listed Nigerian banks covering from 2009 to 2018. GLS regression analysis model was utilized and findings from the study revealed a positive relationship between market risk hedging strategy and financial performance of the banks. Also, Kassi *et al* (2019) [40] examined the effect of market risk on the financial performance of 31 non-financial companies listed on the Casablanca Stock Exchange (CSE) over the period 2000 to 2016. Using ROA, ROE and profit margin as profitability ratio while market risk was proxied by financial leverage, book-to-market and gearing ratio. The study employed the pooled OLS model, fixed and random model, difference-GMM and system-GMM models. The results revealed that the various measures adopted as proxy for market risk produced a significant but negative effect on financial performance. Further, Igbinosa *et al* (2020) [35] Investigated the effect of market risk factors on banks' performance in ECOWAS region using a Panel data of five ECOWAS countries covering a period of 20 years from 1996 to 2016 was sourced from the World Bank database. The investigation used panel data random effect in which the findings showed that exchange rate risk is the most significant market risk factor that has positive effect on bank performance in ECOWAS region.

Obi-Nwosu *et al* (2017) [48] also studied the effect of liquidity risk management on the performance of DMBs in Nigeria performance proxied with ROE and ROA covering a period of fifteen (15) years from 2000 to 2015. The study employed Augmented Dickey Fuller Unit Root Test, OLS regression and Granger Causality test and the findings revealed that liquidity risk do not have a significant relationship with the performance of the DMBs. Again, Muriithi and Waweru (2017) [45] examined the effect of liquidity risk on financial performance of commercial banks in Kenya over a nine-year period from 2005 to 2014 using. Data was sourced from all the 43 banks in Kenya as sample. Secondary data was tested using Panel data random effects. Findings revealed an overall negative effect on financial performance. The study was carried out under a setting different from that of Nigeria necessitating the need to carry out similar study within the Nigeria context.

Toufaili (2021) [66] reviewed the effect of solvency risk as one of the risk management variables on the financial performance of Lebanon banks using primary data collected from over 123 interviewees, analysed using the multiple regression analysis and found that management of solvency risk among others has a positive and significant relationship with performance measured with ROE. The only shortfall of the study is that it was conducted on banks outside the Nigeria jurisdiction using primary data unlike this current study which uses secondary data. Again, Përvetica and Ahmeti (2023) [57] studied the effect of Solvency risk among other IVs on the financial performance proxied with ROA and ROE of banks in western Balkan. Using a panel data fixed effect regression analysis, the study revealed that solvency risk has positive and significant effect on the performance of the banks. The shortfall of this approach is that it was carried out outside the Nigeria jurisdiction and that the performance metrics adopted differs from the one being adopted in this current study.

3. Methodology

The research design adopted in this study is the *ex- post facto* which assesses the effect of an independent variable on the dependent variables using historical data. The study employed a sensor and filter sampling technique to sieve the population which are: (i) banks must be a Nigerian bank listed on the Nigeria Exchange (NGX). (ii) Bank must be operational as at December 2013 and remained listed as at December 2022, (iii) bank must at the minimum, possess national authorisation license due to the similar risks common to them. These criteria when applied produced 12 banks in Table 1, from which the secondary data of the sampled banks' annual reports were analysed using descriptive statistics and OLS regression analysis.

Table 1: Population and sample size of the study

S. No	Bank Name	Year of Incorporation	Year of Listing	Sample Selection
1	Access Bank	1989	1998	√
2	Eco Bank	1985	2006	not selected
3	Fidelity Bank	1987	2005	√
4	FCMB	1982	2004	√
5	First Bank	1894	1971	√
6	Guaranty Trust	1990	1996	√
7	Jaiz Bank	2003	2017	not selected
8	Stanbic IBTC	1989	2005	√
9	Sterling Bank	1960	1993	√
10	UBN	1969	2012	√
11	UBA	1961	1970	√
12	Unity Bank	1987	2005	√
13	Wema bank	1945	1991	√
14	Zenith bank	1990	2004	√

Note: Generated by the author from CBN and NGX on 31st August 2023

The dependent variable is financial performance measured with capital adequacy and firm's value while the independent variables of CRR, MKR, LQR and SVR while the control variables are bank size (BKZ) and bank deposit (BKD) as depicted in the multivariate model:

$$FP = f(Y_1, Y_2), \text{ where } Y_1, Y_2 = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_n x_n + \varepsilon. \quad (1)$$

Since Y_1 = CAR and Y_2= PER. Hence, this model can be represented as in equation (2) and (3).

$$CAR_{it} = \beta_{0it} + \beta_1 CRR_{it} + \beta_2 MKR_{it} + \beta_3 LQR_{it} + \beta_4 SVR_{it} + \beta_5 BKZ_{it} + \beta_6 BKD_{it} + \varepsilon_{it} \quad (2)$$

$$PER_{it} = \beta_{0it} + \beta_1 CRR_{it} + \beta_2 MKR_{it} + \beta_3 LQR_{it} + \beta_4 SVR_{it} + \beta_5 BKZ_{it} + \beta_6 BKD_{it} + \varepsilon_{it} \quad (3)$$

Where as:

CAR = Capital Adequacy Ratio
PER = Price Earnings Ratio
CRR = Credit Risk
MKR = Market Risk
LQR = Liquidity Risk
SVR = Solvency Risks
BKZ = Bank Size
BKD = Bank Deposit
I = bank holding identifier
t = year
β = Beta coefficient (measure of sensitivity or correlation)
*ε = error term * (A constant error term ε was included in the model so as to satisfy the first assumption of the Classical Linear Regression Model that the expected value of the errors must be zero.)*

Capital adequacy ratio (CAR) is the risk weighted asset ratio computed as the ratio of the total qualifying capital to the total risk weighted assets:

$$\text{Risk Weighted Asset Ratio (CAR)} = **\frac{\text{Total qualifying capital (TQC)}}{\text{Total risk weighted asset (TRWA)}} \times 100$$

***The total qualifying capital is arrived at as: (Total 1st Tier capital + Total 2nd Tier capital) less investment in unconsolidated subsidiaries and associates (CBN, 2009).*

Firm's value proxied by price to earnings ratio (PER) is computed as the ratio of firm's value per share (MVPS) of the banks to their earning per share (EPS)

$$\text{Price Earnings Ratio (PER)}*** = \frac{\text{Mkt Value Per Share (MVPS)}}{\text{Earnings per share (EPS)}} \times 100\% \quad \text{(Jason, 2024).}$$

****A low PER indicates a low share price (SP) compared to the earnings capacity of the bank while a high PER indicates a share price that is higher than the earning capacity of the banks:*

Table 2 presents the summary of the dependent and independent variables with their codes and adopted proxies.

Table 2: Variables Definitions, Measurement and Sources

Variables (Codes)	Proxy	Measurement	Source
Capital Adequacy (CA)	Capital Adequacy Ratio (CAR)	(TQC)/ TRWA*100	(CBN, 2009)
Firm's value (MV)	Price Earnings Ratio (PER)	(MVPS)/ EPS*100	(Jason, 2024) [37]
Credit Risk (CRR)	Non-performing loan to Total loan ratio(NPL/TL)	Total reg. impairment (TRI)/ Total loan(TL)	(Fabrice, 2018) [30].
Market Risk (MKR)	Book to Market Ratio	Book Value of equity/ Firm's value of equity (BVe/ MVe)	(Kassi *et al*., 2019) [40].
Liquidity Risk (LQR)	Loans to deposit ratio	Loan and advances to Total Deposit. (LA/TD)	(Tijani & Abdullahi, 2021) [65].
Solvency Risk (SVR)	Shareholders equity ratio	Total equity /Total asset	(Pierret, 2015) [58].
Control Variable 1	Bank Size (BKZ)	Weighted Ave Log of Total asset	Modified (Cornett, *et al*, 2006) [21]
Control Variable 2	Bank Deposit (BKD)	Log of Bank Deposit	(Hassan, 2011) [34]

Source: Author's literature review

Diagnostic Tests

Diagnostic tests conducted include Shapiro-Wilkson test for Normality, Pearson correlation coefficients, Multicollinearity tests of tolerance value (TV) and variance inflation factor (VIF) were used to test the fitness of the variables. Meanwhile the IM- White test and the Cameron and Trivedi's decomposition test for heteroscedasticity were adopted to validate the assumption of the classical linear regression model (CLRM). Thereafter, the Breusch and Pagan Lagrangian multiplier test was used to identify the choice of the appropriate regression technique.

4. Data presentation analysis and Interpretation

The detail of the data input processed using Stata 15 and the output thereof are presented in the Appendix i and ii while Table 3 shows the descriptive statistic of the data. The DV of financial performance measured with capital adequacy ratio (CAR) and price earnings ratio (PER) revealed a mean of 18% and 50% respectively. This suggest a weak performance level of capital adequacy and a stronger performance level of firm's value for the reviewed banks with highest maximum achievement at 28% and 99.6% respectively. The independent variables showed that credit risk (CRR) has a mean of 5% showing a very low credit risk level. While marker risk (MKR) is 19% meaning the market is fairly volatile. Meanwhile liquidity risk stands at 65% showing that the industry has a very high liquidity risk level and solvency risk (SVR) is 13% showing a fairly low solvency risk. The control variables of bank size (BKZ) and bank deposit (BKD) both recorded a mean of 9% each.

Table 3: Descriptive Statistics

Variables	Obs	Mean	Std. Dev	Min	Max
CAR	120	0.1848	0.0398	0.0955	0.2830
PER	120	0.5048	0.2114	0.1451	0.9963
MKR	120	0.1878	0.1859	0.0001	0.9419
CRR	120	0.0505	0.0417	0.0050	0.3938
LQR	120	0.6478	0.1592	0.1035	0.9671
SVR	120	0.1301	0.0433	0.0572	0.3958
BKZ	120	0.0930	0.0195	0.0956	0.1049
BKD	120	0.0914	0.0042	0.0834	0.9973

Source: Output of data analysis STATA 15

Diagnostic Test Result

The diagnostic tests of Shapiro- Wilk W test conducted shows evidence that some of the variables are not normally distributed since the P-values are significant at 1%: i.e $p< 0.01$. therefore, the Null hypothesis assuming normal distribution is rejected and non- normality accepted. Nevertheless, this is not expected to have any significant effect on the output of the regression analysis. The tolerance value TV and VIF are within acceptable limit as lowest TV is 0.74 and highest is at 0.93. Also the highest VIF stands at

1.34 while the lowest is 1.08 thus confirming no significant multicollinearity. Again, the Cameron & Trivedi's decomposition test and the IM-White test did not show presence of significant heteroscedasticity as the Chi^2 (27) = 44.37 with Prob > Chi^2 = 0.0189 for CAR and Chi^2 (27) = 27.29 with Prob > Chi^2 = 0.4483 respectively because P > 0.01 in both cases. The Breusch and Pagan Lagrangian multiplier test for appropriate regression technique found no evidence of panel effect on the variables with Prob> Chibar2 = 1.000, for CAR and Prob> Chibar2 = 0.3190, for PER showing that the pooled OLS regression analysis is more appropriate for both models.

Multivariate Regression Analysis

The R^2 of the multivariate pooled OLS regression analysis is approximately 12% for CAR and 30% for PER as shown in Table 4, while the regression result are represented in the models for CAR and PER.

CAR = 0.662 - 0.001MKR - 0.107CRR - 0.065LQR - 0.011SVR – 0.529BKZ + 0.011BKD

PER = 0.206 - 0.455MKR - 0.083CRR + 0.340LQR +1.180SVR – 1.012BKZ + 0.112BKD

Table 4: Summary of (Random Effect) Panel Regression Result

	CAR				PER			
	Coef.	***T***	***P>|t|***	***Sig***	***Coef.***	***T***	***P>|t|***	***Sig***
MKR	-0.001	-0.03	0.976		-0.454	-4.80	0.000	***
CRR	-0.107	-1.22	0.223		-0.083	-0.20	0.842	
LQR	-0.065	-2.64	0.010	***	0.340	2.95	0.004	***
SVR	-0.011	-0.13	0.895		1.180	2.92	0.004	***
BKZ	-0.529	-2.63	0.010	***	-1.012	-1.06	0.290	
BKD	0.011	1.13	0.260		0.112	2.43	0.017	**
_cons	0.662	3.61	0.000		0.206	0.24	0.813	
Number of observations		120				*120*		
F(6, 113)		2.46				*8.07*		
Prob> F		0.0284				*0.0000*		
R-Squared		0.1155				*0.3000*		
Root MSE		0.03843				*0.18149*		

Source: Output of data analysis STATA 15

***, ** & * = probability significance at 1%, 5% &10% respectively

CAR = 0.662 - 0.001MKR - 0.107CRR - 0.065LQR - 0.011SVR – 0.529BKZ + 0.011BKD

This result show that 12% variance of banks' capital adequacy as indicated by R^2 is explained by variation in the four risk management variables. Since the result gave an overall positive and significant level of 0.03, thus P< 0.05, therefore Hypothesis H_0 which states that risk management have no significant effect on capital adequacy of DMBs in Nigeria is rejected while we accept the alternative hypothesis H_1. The study also noted a negative but insignificant association with market risk -0.1%, credit risk -10.7% and solvency risk -1.1% respectively. However, liquidity risk has a negative but significant effect at -6.5% on capital adequacy.

PER = 0.206 - 0.455MKR - 0.083CRR + 0.340LQR +1.180SVR – 1.012BKZ + 0.112BKD

This result implies that 30% variance of the banks' firm's value as measured by PER is accounted for by R^2 for the changes in the risk management variables. Since the result gave an overall positive and significant level of 0.000, thus P< 0.01, therefore Hypothesis H_0 which states that risk management have no significant effect on firm's value of DMBs in Nigeria is rejected while we accept the alternative hypothesis H_1. The study also noted positive but significant relationship for LQR 34% and SVR 118% with firm's value. Similarly, the model yielded a negative and significant result for MKR -45.5% but negative and insignificant for CRR -8.3% with firm's value.

It is of note that the result of previous studies reviewed have some similarity with the result of this study. For example, Okonkwo and Nwokeji (2018) [53] and Okere, *et al.* (2018) [52] which studied Credit risk management and financial performance of (DMBs) in Nigeria found that credit risk has significant positive effect on financial performance. Likewise, Adesina *et al.* (2020) [1] and Igbinosa *et al.* (2020) [35] which studied market risk and financial performance found a positive relationship between market risk and financial performance of the banks. However, Kassi *et al.* (2019) [40] found a significant but negative effect of market risk on financial performance. Meanwhile, Obi-Nwosu *et al.* (2017) [48] which studied the effect of liquidity risk management on the performance of DMBs in found no significant relationship with the performance of the DMBs. But Muriithi and Waweru (2017) [45] found an overall negative and significant effect of liquidity risk on financial performance. Also, Përvetica and Ahmeti (2023) [57] and Toufaili (2021) [66] which reviewed the effect of solvency risk both found a positive and significant relationship with performance.

5. Conclusions and Recommendations

The result of this study shows an overall positive and significant effect of risk management on financial performance of the banks proxied with price earnings ratio and capital adequacy ratio of the banks. Secondly the fact that management of market risk, credit risk, liquidity risk and solvency risk when individually accessed has negative effect on capital adequacy means that effective management of these risks elements would actually reduce the capital requirements of the banks in line with Basel ii and iii which matches risks with capital adequacy requirements of the banks.

This finding also reveals that the effective management of the liquidity risk and solvency risk would improve the performance of the banks in terms of firm's value thereby making the banks more appealing to the investors who are concerned with appropriate returns on the value of their investment. Consequently, this study concludes that the Price to earnings ratio model is a better predictor of financial performance in the analysis.

Accordingly, this study recommends that board of Directors and executive management of banks especially those vested with the responsibility of formulating the overall goals and policies of the banks should ensure strict implementation and adherence to the management of these risks elements in other to achieve and sustain the improved performance of the banks as well as maintain and improve the values accorded to the banks from the stakeholder's point of view. This study further recommends that government agencies, policy makers, regulators and others vested with the monitoring and supervision of the activities of the DMBs should monitor the deposit money banks and ensure that the risk management activities of the banks assign sufficient

resources towards identifying new and emerging risks and providing policy and procedural guidelines for the banking industry with the overall goals of improving the performance of the banks.

References

1. Adesina T, Nasieku T, Oluoch O. Market risk hedging strategy and financial performance of Nigeria listed banks. European Journal of Business and Management. 2020; 12(15):100-106. ISSN: 2222-2839
2. Adeusi SO, Akeke NI, Adebisi OS, Oladunjoye O. Risk management and financial performance of banks in Nigeria. IOSR Journal of Business and Management (IOSR-JBM). 2013; 14(6). http://www.iosrjournals.org/iosr-jbm/papers/Vol14-issue6/H01465256.pdf?id=7380 0
3. Almarzoqi R, Naceur SB, Scopellit AD. How does bank competition affect solvency, liquidity and credit risk? Evidence from the MENA countries. IMF Working Papers-WP/15/210, 2015. https://www.imf.org/external/pubs/ft/wp/2015/wp15210.pdf
4. Aneta H. Government Intervention- restoring or destructing financial stability in the long run? An Unpublished Thesis of University of Kozminski, 2012.
5. Anetoh VC, Nwadialr EO, Anetoh JC, Okeke GN. Assessing the effect of capital adequacy risk and liquidity risk on firm's value of deposit money banks in Nigeria. African Journal of Accounting and Financial Research. 2021; 4(1):33-49. http://www.abjournals.org/
6. Aruwa S, Musa A. Risk components and the financial performance of deposit money banks in Nigeria. International Journal of Social Sciences and Entrepreneurship. 2014; 1(11):514-522.
7. Argyro P. The effect of corporate risk management and market value: evidence from the UK market. The European Journal of Finance. 2014; 20(12):1161-1186. Doi: http://dx.doi.org/10.1080/1351847X.2013.766625
8. Ashike HM. CBN's new FX rules to shore-up dollar supply, stabilise naira. Online Business Day, January, 31, 2024. Available at: https://businessday.ng/business-economy/article/cbns-new-fx-rules-to-shore-up-dollar-supply-stabilise-naira/
9. Audu I. Guidelines on risk management in financial services industry. Understanding Monetary Policy Series. 2014; 40. https://www.cbn.gov.ng/out/2016/mpd/understanding%20monetary%20policy%20series%20no%2040.pdf
10. Banjo D. CBN's timely intervention saved Nigerian's banks. Leadership Newspaper, October 29, 2011.
11. Basel Committee on Banking Supervision. Principles for the sound management of operational risk, Technical Report, Bank of International Settlement, 2011. Doi: 10.1108/JRF-11-2016-0142/full/html
12. Beck U. The risk society: Towards a new modernity. London: Sage. 1992, 19-20.
13. Business Continuity Institute (BCI). Business continuity management. Good Practice Guidelines, BCI U.K, 2005. www.thebci.org/gpg.htm
14. Business Dictionary. Risk defined. *Online Business Dictionary,* 2017. www.businessdictionary.com/definition/risk.html
15. CBN. Reforms in banking system. Banking Supervision Annual Report. CBN. Abuja, 2005.
16. CBN. Guidelines for developing risk management framework for individual risk elements in banks. CBN Circulars. Central Bank of Nigeria, 2007. https://www.cbn.gov.ng/OUT/CIRCULARS/BSD/2007/GUIDELINES%20FOR%20INDIVIDUAL%20RISK%20ELEMENTS%20SEPT%202007C.PDF
17. CBN. Risk management in financial services industry. Monetary Policy Series No 40, Central Bank of Nigeria, 2014. https://www.cbn.gov.ng/out/2016/mpd/understanding%20monetary%20policy%20series%20no%2040.pdf
18. Chockalingam A, Dabadghao S, Soetekouw R. Strategic risk, banks, and Basel III: Estimating economic capital requirements. Journal of Risk Finance. 2018; 19(3):225-246. Doi: https://doi.org/10.1108/JRF-11-2016-0142
19. Chukwu AO, Akintoye IR, Ajibade AT. Interrogative of enterprise risk management practices on banks' financial performance in Nigeria. International Journal of Business Management. 2023; 11(5). Doi: https://doi.org/10.24940/theijbm/2023/v11/i5/BM2305-027
20. Chuxuan S, Xiaoyue C. The impact of credit risk on profitability of commercial banks. An Unpublished Thesis: Simon Fraser University, 2018.
21. Cornett M, McNutt J, Tehranian H. Corporate governance and earnings management at large U.S. bank holding companies. Boston College Seminar, Southern Illinois University, 2006. https://www2.bc.edu/~tehranih/marcia_jamie_hassan.pdf
22. Corporate Finance Institute (CFI). Return on capital employed. CFI Education Inc, 2015. https://corporatefinanceinstitute.com/resources/knowledge/finance/return-on-capital-employed-roce/
23. CFI. Firm's value overview: How to express, how to calculate. CFI Education Inc. on line publication, 2020. https://corporatefinanceinstitute.com/resources/knowledge/valuation/market- value/
24. Crawford J. Regulation's influence on risk management and management control systems in banks, Doctoral thesis, Uppsala University. Sweden, 2017. ISSN: 1103-8454. http://urn.kb.se/resolve?urn=urn:nbn:se:uu:diva-332037
25. Davis JH, Schoorman D, Donaldson L. Toward a stewardship theory the Academy of Management Review. 1997; 22(1):20-47. Doi: 10.2307/259223
26. David H. What is risk? Towards a common definition. The Official Journal of the Institute of Risk Management. UK, 2002, 12-13.
27. Deloitte. Risk management in the spotlight. Global Risk Management Survey:Deloitte, 2009, 1-40.
28. Deloitte. Operating in the new normal: Increased regulation and heightened expectations, Global Risk Management Survey. 9th edition, 2015. https://www2.deloitte.com/content/dam/Deloitte/ru/Documents/financial-services/ru-global-risk-management-survey-9th-edition.pdf
29. Deloitte. Strategic risk Management in Banking. Inside Magazine. 2017; 14(1). https://www2.deloitte.com/content/dam/Deloitte/lu/Documents/financial-

services/Banking/lu_inside_issue14_strategic_risk_management.pdf
30. Fabrice TK. The Impact of credit risk management on the performance of commercial banks in Cameroon. Case study of BICEC Cameroon. Global Journal of Management and Business Research: Corporate. 2018; 18(7). https://globaljournals.org/GJMBR_Volume18/2-The-Impact-of-Credit-Risk-Management.pdf
31. Fama E. Agency problems and the theory of the firm. The Journal of Political Economy. 1980; 88(2):288-307. http://www.jstor.org/stable/1837292
32. Fidelity. Understanding market capitalisation. DST Systems Inc, 2017. https://www.fidelity.com/learning-center/trading-investing/fundamental-analysis/understnding-market-capitalization#
33. Gujarati N, Portal C. Basic econometrics, 5th ed. McGraw Hill: NY, 2010.
34. Hassan SU. Corporate governance and financial reporting quality: A study of Nigeria money deposit bank. International Journal of Research in Computers Application and Management. 2011; 1(6):12-19. ijrcm.org.in/download.php?name=ijrcm-2
35. Igbinosa S, Ogiemudia O. Market risk factors on banks performance in Ecowas Country. Advanced Research Journal of Economics Business and Accounting. 2020; 1(1):23-54.
36. Information System Audit & Control Association (ISACA). Risk: Getting started with risk management, ISACA on Line Cyber Security Publication, 2018, 1-17. https://cybersecurity.isaca.org/info/cyber-aware/images/Getting-Started-With-Risk-Management_res_eng_0218.pdf
37. Jason F. P/E Ratio definition: Price-to-earnings ratio formula and examples. Investopedia, February 09, 2024. Available at: https://www.investopedia.com/terms/p/price-earningsratio.asp
38. Karl R, Christine Z. Three failed bank this year were more than 25 that failed in 2008. The New York Times, May 1, 2023. https//www.nytimes.com/interactive/2023/business/bank-failures-svb-first-republic- signature.html .
39. Kaehler B, Grundei J. The concept of management: In search of a new definition. HR Governance, 2019, 3-26. Doi: 10.1007/978-3-319-94526-2_2
40. Kassi DF, Rathnayake DN, Louembe PA, Ding N. Market risk and financial performance of non-financial companies listed on the Moroccan stock exchange. Risks. 2019; 7(1). Doi: https://doi.org/10.3390/risks701002
41. Kedar BZ. Arabic risq, medieval Latin risicum. Studi Medievali. 1970; 10(3):255-259.
42. Krugman P. The Return of depression economics and the crisis of 2008. W.W. Norton Company Limited, May 27, 2009. ISBN 978-0-393-07101-6
43. Malm J, Kenneth WS, Kanuri S. Litigation risk and corporate performance. Journal of Behavioural and Experimental Finance. 2023; 37(1). Doi: https://doi.org/10.1016/j.jbef.2022.100725.
44. Muriithi JG. Effect of financial risk on financial performance of commercial banks in Kenya. PhD Finance Dissertation, Jomo Kenyatta University of Agriculture and Technology, Kenya, 2016. https://www.semanticscholar.org/paper/Effect-of-financial-risk-on-financial-performance-Muriithi/81298fd26efd0ba5ff504a54776d5c7efbdd017e
45. Muriithi J, Waweru K. Liquidity risk and financial performance of commercial Banks in Kenya. International Journal of Economics and Finance. 2017; 9(3):256-265. Doi: https://doi.org/10.5539/ijef.v9n3p256
46. Murphy DL, Shrieves RE, Tibb SL. Determinates of the stock price reaction to allegations of corporate misconduct: Earnings, risk, and firm size effects. Semantic Scholars, 2004. https://api.semanticscholar.org/CorpusID:7976604
47. Nigeria Stock Exchange. Listed Companies. Nigeria Stock Exchange, 2019. http://www.nse.com.ng/Listings-site/listed-securities/listed-companies
48. Obi-Nwosu V, Nguna A, Ogonna OS, Ogbonna KS. Effect of liquidity on performance of deposit money banks. International Journal of Advanced Engineering and Management Research. 2017; 2(4):1281. www.ijaemr.com
49. Odigbo JA, Abubakar YA, Shuaibu H. Effect of enterprise risk management on financial performance of DMBs. Sapientia Global Journal of Arts, Humanities and Development Studies (SGOJAHDS). 2022; 5(2):179-191. ISSN: 2695-2327
50. Odingo HO. Corporate governance, risk management, firm characteristics and financial performance of commercial banks in Kenya. [Ph.D. Thesis, University of Nairobi] University of Nairobi e-repository, Kenya, 2016. http://erepository.uonbi.ac.ke/bitstream/handle/11295/99724/Thesis%2074.pdf?sequence=1&isAllowed
51. Ojo AT. The Nigeria maladapted financial system: reforming task and development dilemma. CIBN press limited. Lagos, 2010.
52. Okere W, Isiaka M, Ogunlowore A. Risk management and financial performance of deposit money banks in Nigeria. European Journal of Business, Economics and Accountancy. 2018; 6(2). ISSN: 2056-6018
53. Okonkwo IV, Nwokeji MI. Credit risk management and financial performance of DMBs. in Nigeria. International Journal of Social Sciences and Management. 2018; 1(2). http://ijssmr.org/uploads/ijssmr01_09.pdf
54. Olawale F, Obamuyi T, Owoputi J, Adeyefa A. Credit risk and bank performance in Nigeria. IOSR Journal of Economics and Finance. 2015; 6(2):21-28. www.iosrjournals.org
55. Omanufeme S. IMF recommends AMCONs liquidation to curb moral hazard. Business Day, Nigeria, April 2, 2013. http://businessdaynigeria.com/imf-recommend-amcon-sliquidation-curbmoral-hazard
56. Oniovosa OJ, Godsday OE. Enterprise risk management and market value: Evidence from selected commercial banks in Sub-Saharan Africa. International Journal of Applied Economics, Finance and Accounting. 2023; 16(2):199-207. Doi: https://doi.org/10.33094/ijaefa.v16i2.949
57. Përvetica AK, Ahmeti S. The effect of financial risk management on the financial performance of commercial banks in Western Balkan before and during COVID-19. Economic Studies. 2023; 32(7):179-190.

58. Pierret D. Risk and the solvency-liquidity nexus of banks. International Journal of Central Banking. 2015; 11(3):193-227. https://www.ijcb.org/journal/ijcb15q3a5.pdf
59. Roberts P. Measuring and managing risk in UK listed firms. PhD Thesis, University of Nottingham repository, 2016. http://eprints.nottingham.ac.uk/32850/1/Thesis%20v.3.pdf
60. Sagara D, Pedro J, Qiji Z. The optimum leverage level of the banking sector. Risks. 2019; 7(2). Doi: https://doi.org/10.3390/risks7020051
61. Shinn L. What Happened to Signature Bank? Personal Finance, Banking. Dotdash Meredith publishing family, May 01, 2023. Available at: https://www.investopedia.com/what-happened-to-signature-bank-7370710
62. Sithipolvanichgul J. Enterprise risk management and firm performance: Developing risk management measurement in accounting practice. A Doctoral Dissertation, University of Edinburgh, 2016, 16-17.
63. https://www.semanticscholar.org/paper/Enterprise-risk-management-and-firm-performance-%3A-Sithipolvanichgul/90f17aac466f897918bec93d347364c4c43badf5
64. Solimah A, Mukhtar A. Enterprise risk management and firm performance: an integrated model for the banking sector. Banks and Bank Systems. 2017; 12(2):116-123. Doi:10.21511/bbs.12(2).2017.12
65. Tijani JO, Abdullahi MS. Banks and credit risk management in Nigeria. International Journal of Economics, Commerce and Management. 2021; 9(12):253-272. http://ijecm.co.uk/
66. Toufaili B. The impact of risk management on financial performance. The EUrASEANs: Journal on Global Socio-Economic Dynamics. 2021; 3(28):7-23. Doi: https://doi.org/10.35678/2539-5645.3(28).2021.7-23
67. Vidhura ST. Analysis: Why Silicon Valley Bank and Signature Bank failed so fast. The Conversation. PBS News Hour, March 14, 2023. Available at https://www.pbs.org/newshour/economy/why-silicon-valley-bank-and-signature-bank-failed-so-fast
68. Wachiaya J. A survey of market risk management techniques by commercial banks in Kenya and their suitability in mitigating financial loss. Doctoral Dissertation, University of Nairobi, Kenya, 2011. https://www.semanticscholar.org/paper/A-survey-of-market-risk-management-techniques-by-in-Wachiaya/dddfeadc6e7ed47f250e0115a7c56f62419a1875
69. Yvonne KM. The effect of risk management on financial performance of commercial banks in Kenya. Semantic Scholars, 2013. Available at: https://pdfs.semanticscholar.org/0421/37d5bfe3fa8f6e628426948e2c516d8586fe.pdf
70. Zaby S, Pohl M. The management of reputational risks in banks: Findings from Germany and Switzerland. Sage Open Journals. 2019; 9(3):1-15. https://journals.sagepub.com/doi/full/10.1177/2158244019861479