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**FINANCIAL RISK AND PROFITABILITY OF LISTED DEPOSIT
MONEY BANKS IN NIGERIA: MODERATING ROLE OF BOARD
DIVERSITY**

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Abstract

The financial crises experience by banking sector in Nigeria as a result of 2009 global financial economic meltdown that have led to the challenges of liquidity problem and high operational cost to banks which have affected the operations of businesses and Banks thereby reduce their turnover and profitability. It is against this backdrop that this study examines the effect of financial risk and profitability with a moderating role of board diversity of listed Deposit Money Banks in Nigeria from the period 2010-2019. The census sampling technique was adopted for the study. Secondary data was extracted from the annual report and accounts of the sampled banks. Financial risk as the independent variable was proxied with liquidity risk, credit risk, operating risk while the profit before tax was used to proxy profitability. The hypotheses were stated in a null form and multiple regressions were used to analysis the data. The study adopted panel corrected standard errors (PCSEs) regression model. The findings of the study documented that the moderate role of gender diversity revealed a negative and significant role on the effect of credit risk and operation risk on profitability of listed deposit money banks in Nigeria. It is recommended among others that the banks should minimize the non-performing loan through proper implementation of risk management framework and minimized

unnecessary operating expenses as it have been found empirically to reduce the quality of the bank's profitability and CBN should encourage banks to appoint female director in the board composition.

Keywords: *Financial risk, Profitability, Board diversity, DMBs, Nigeria*

1. Introduction

When the Central bank of Nigeria (CBN) were drawing plans to prevent a repeat of the global financial crisis of 2008 through the banking reforms, they rightly hit upon the idea that banks should hold substantial buffers in terms of capital and liquidity that would see them survive whenever another financial crisis occurs. The asset quality of Deposit Money Banks in Nigeria can deteriorate significantly depending on the duration and severity of the oil price downturn. According to Central Bank of Nigeria, (2019), loans and advances in the oil and gas sector constituted about 30% of the total risk assets in the banking industry as at the end of September 2019. A look at the trends in 2008-2009 and 2015-2016, when the country was faced with similar circumstance of low oil prices, showed an increase in Non-Performing Loans (NPLs).

Financial risk is a crucial factor which may occur due to default in operational activities for any business without consent to the nature or the size of the business. Financial risk is defined as management of various internal risks such as credit risk, liquidity risk, market risk, and others risk that the company could face either now or in the future (Thompson, 2019). Profitability is usually measured by all or part of a set of financial ratios. Key indicators include the profit before tax, profit after tax, return on equity, and the return on assets (Alzorqan, 2014). Therefore, corporate profitability is the measurement of firm performance and the banks business stability and growth trends are the best summary indicators of a bank's profitability in both the present and the future.

The relationship between financial risk and profitability has to be managed in order to create better returns to the investors and expected with the risk they are bearing (Yahaya, Limidi, & kutigi, & Ahmed, 2015). Furthermore, an unproductive and inappropriate bank risk may lead to financial complexities and subsequently to banking crisis.

Nigerian financial sector has been undergoing series of reforms due to bad corporate governance practices and a suspicion of fraudulent activity (CBN, 2010). More so, many of the banks have not been able to establish strong financial risk management framework, particularly credit risk management in order to prevent unfavourable events (CBN, 2010). Furthermore, the full implementation of treasury single account (TSA) policy in 2015 by the Nigerian government resulted in decrease in liquidity position of banks in Nigeria, thus prone banks to liquidity risk thereby negatively affected the amount of loan to customer.

The study intends to establish whether board diversity amongst board members can moderate financial risk on profitability of listed deposit money banks. In general, previous studies have relied on limited data sets and no empirical studies has adopted board diversity as analytical methodologies to moderate the effect of financial risk on profitability. Therefore, it is against this background that this study examined the effect of financial risk on profitability of listed deposit money banks in Nigeria as moderated by board diversity. The focus of financial risk in quantitative view lies on improving the measurement of specific risks such as liquidity risk, credit risks, and operational risk.

In view of this, the research question can be summarized on how does board diversity moderate the effect of financial risks on profitability of listed deposit money bank in Nigeria? Furthermore, the objective of the study is to examine the effect of financial risk on profitability: moderated by board diversity of deposit money banks in Nigeria. In order to achieve the research objectives, the hypotheses in null form shall be tested in this study; board diversity has no significant moderating role on the effect of financial risk on profitability of listed deposit money banks in Nigeria.

2. Review of Previous Related Studies

Profitability is referred to as the earning power of a firm. It is a crucial element of the bank's toward achieving returns to shareholders. However, the soundness of a banking system is a crucial pillar for profitability and considered as an essential mechanism for economic development (Abdelaziz Hakimi & Khemais, 2017). A good performance bank can generate more profits which can lead to future investment.

Financial risk occurs as a result of uncertainties of loans defaults, liquidity management, volatility of interest rate and changes in foreign currency rates (Zhongming & Frimpong, 2019) Financial risk play an important role in determining the overall profitability of banks. Financial risk is the variable that would be used in this study includes liquidity risk, credit risk and operational risk. The justification for the selection of the three financial risk characteristics is because they form part of the daily operational activities of the banks and it has been empirically proven that the financial risk determines the profitability of the banks. More so, they variable are contain in the financial statement of the banks.

Liquidity risk is define as the risk of insufficient liquid assets to meet payouts from policies (surrender, expenses, maturities, among others), forcing the sale of assets at lower prices, leading to losses, despite company being solvent (kamau, & Njeru, 2016). Credit risk is an important element that needs to be effectively managed by banks because credits is a core mandate of the banking sector. Credit risk is the probability of losing an outstanding loan either partly or in full, due to the default in repayment. A dynamic credit risk framework is crucial for banks to maximize their profitability and prevent forceful mergers and acquisition(Coco Ling, 2019). Operational risk is referring to as the potential financial loss as a result of breakdown in day to day operational processes. It can arise from failure to comply with policies, laws and regulations, from fraud or forgery (Njogo, 2012).

Board diversity represents an important corporate governance structure in order to realize efficient and effective financial risk management and other monitoring mechanism within banks. Thereby, the consideration of diversity when selecting the board of directors is essential to companies.

Baldwin and Mason (1983) purported that when a firm's business deteriorates to the point where it cannot meet its financial obligation, the firm is said to have entered the state of financial distress. Whitaker (1999) defines entry in financial distress as the first year in which cash flows are less than current maturities' long-term debt. The key factor in identifying firms in financial distress is their inability to meet contractual debt obligations. The theory of financial distress emanates from the liquidity and credit risk facing a firm. This theory provides for a non-biased perspective on the relationship between credit risk and financial performance variables employed by the study. By providing information that the effects of financial distress occur prior default risk, the theory offers a neutral

platform to undertake an incisive empirical analysis of this relationship within the commercial banks.

Nelly *et al.*, (2019) examine the effect of financial risk exposure on financial performance of commercial banks in Kenya. The finding of the study revealed that liquidity risk has a positive and significant effect on financial performance while credit risk has a negative and significant effect on Kenya bank financial performance. Also, Zhongming and Frimpong, (2019) study the impact of financial risk on banks' financial performance in Ghana. The analysis of the data revealed the existence of significant long run impact of financial risk on financial performance.

Fakhrunnas and Imron, (2019) assess the internal and external risks that influence to the bank performance. Panel data was adapted to analyzed 21 biggest Islamic rural banks in Indonesia during 2013-2017. The study finds that Non- Performing Financing (NPF) has negative and significant influence on ROA that explains the performance of Islamic rural. Furthermore, Bogale, (2019) investigates the factors affecting the profitability of fourteen private commercial banks in Ethiopia, from 2008 to 2017, using unbalanced panel data. The fixed effect regression output revealed that credit risk and liquidity risk were found not powerful variables in the determination of banks profitability.

Elshaday, Kenenisa, and Mohammed, (2018) examine the determinants of the financial performance of private commercial banks in Ethiopia. Eight banks were chosen from the sixteen banks in Ethiopia banking industry from 2007 to 2016. The random effect results show that Non-performing Loans and Loan Loss Provision have negative and statistically significant effect on financial performance. In addition, Jin, (2019) examined the financial risks and performance of Cocoland Holdings Berhad which is a food and beverages company for the period of 2014-2018. The study used multiple linear regression models. The results show that operating margin is the most significant variable that positively influence the performance of the company.

Arif, Hussain, Anjum and Jawad, (2016) assess the effect of risk management on the performance of both large banking institutions and small banking institutions in Pakistan from 2005-2014. The random effect regression result revealed that operational risk is a key driver of profitability in large banks in Pakistan. The

study of Rozmina and Mwangi (2017) examine the impact of board gender diversity on profitability of the agricultural listed companies in the Nairobi Securities Exchange over the period 2008 to 2015. Panel data is analysed using Fixed Effect model and Random Effect model. The result shows that the presence of women on boards of director was found to be positive and statistically significant. This means that presence of women on boards of agricultural listed firms will lead to increased profitability.

3. Methodology and model

The study adopts the ex-post facto research design. The population of this study consist of thirteen (13) listed deposit money as show in the Nigeria Stock Exchange banks from 1st January 2010 to 31st December 2019 and this study use all the banks. The census technique was adopted because the entire population is use for the study, which is based on all the bank’s listed on Nigeria Stock Exchange. The data is collected through secondary sources only, that is, through the published annual reports of the study banks before analysing the data using the STATA 13 statistical software.

The model encapsulates the incorporating board diversity as the moderating variable that affect the direct relationship in equation,

$$PBT_{it} = \beta_0 + \beta_1 LR_{it} + \beta_2 CR_{it} + \beta_3 OPR_{it} + \beta_4 BD_{it} + \beta_5 LR * BD_{it} + \beta_6 CR * BD_{it} + \beta_7 OP * BD_{it} + \epsilon$$

Where:

NL.PAT= Natural logarithms of (PBT) Profit Before Tax and Interest, LR= Liquidity risk, CR= Credit risk, OPR= Operational risk, BD= Board Diversity, i= number bank observation, 1- - - 12, t= the index of time periods ϵ =is the error component for bank β_0 = Intercept of the model “Constant” $\beta = 1, 2 . . .$ are parameters to be estimated.

Variables Definition and Measurement

Variables	Measurement	Sources
Dependent Variable		
Profitability	The ratio is considered an indicator of how efficient a company is using its assets to generate revenue (Natural Logarithms of Rivera, 2017) Profit Before Tax and Interest)	

Independent Variable

Liquidity risk	Measured as ratio of banks Loan and advance to deposit by customer and banks (Yousfi, 2014).
Credit risk	Measured as the ratio of Nonperforming loans to total loans (Arif Hussain, Ihsan& Hussain, 2016)
Operational risk	measured as the ratio of operating expenses to banks turnover (Noman, 2015)
Board diversity	(Moderating Variables) Measure as ratio of female director to total numbers of directors. (Taljaard et al., 2015)

Source: Field work, (2020)

4 Results and discussions

This section presents and discuss both descriptive and inferential statistics. It also discusses the findings and implications of the study.

Descriptive Statistics.

Variables	Mean	Std Dev.	Minimum	Maximum
PBT	8.785	5.229	-11.625	12.402
Liquidity Risk	0.655	0.183	0.081	1.063
Credit Risk	0.053	0.064	0	0.393
Operational Risk	0.699	0.271	0.081	2.586
Bank Size	20.704	1.672	13.983	22.878
Gender	0.201	0.119	0	0.647

Source: Output Generated Using STATA 13

Table 3, revealed that the profit before tax (PBT) has minimum value of -11.625 and maximum value of 12.402. This signifies that, the least bank of the sampled banks incurred 11.6%t loss for each of single Naira investment in the bank with an average mean value of 8.785. Liquidity risk has minimum value of 0.082 and a maximum value 1.064 respectively. The mean value of liquidity risk is 0.6550846 with standard deviation of 0.1824629. Credit risk has a minimum value of 0.000 and a maximum value 0.393. however, the mean value of 0.053 with a standard deviation of 0.064. Also, operating risks have minimum and maximum values of 0.081 and 2.586 respectively and the average value is 0.699. Bank size has a mean value of 20.704. Furthermore, board gender has a mean value of 20%, and a

minimum and maximum of 0 and 64.7% respectively. The statistics indicates some banks has no female gender on their corporate boards.

Normality Test of Data

Normality Test of Data

Variables	Obs.	W	V	Z
				<u>Prob>Z</u>
PBT	130	0.50524	50.950	8.844
				0.00000
LR	130	0.98308	1.742	1.249
				0.10580
CR	130	0.64907	36.139	8.072
				0.00000
OPR	130	0.80342	20.244	6.768
				0.00000
BS	130	0.77579	23.089	7.064
				0.00000
BD	130	0.94246	5.926	4.003
				0.00003

Source: Output Generated Using STATA 13

Shapiro-Wilk (W) test for normality of variables are not normally distributed because the P-values are significant at 1% level of significance (p-values of 0.001). Therefore, the null hypothesis is rejected for PBT, credit risk, operating risk, bank size and gender diversity. Except for liquidity risk which revealed an insignificant p-value of 0.150580. therefore, this may lead to some problems in OLS regression and, hence the need for a more generalized regression model.

Robustness Test for Model

Variables	Statistics	P-Values
Hausman Test	17.70	0.0236
Hetest	27.87	0.0000
Mean VIF: Chi2	1.10	
PCSEs Model Adopted to correct for errors		

Sources: Output Generated Using Stata 13

The measure of profitability in this study is extracted from the models. However, the classical assumptions of OLS regression with regard panel data require the model to be fit and unbiased for a valid interpretations and conclusions. As such this study subjected the model to other regression models (Fixed and Random Effects) in addition to OLS conducted and correction for errors in the model was done using robust model and panels corrected standard errors (PCSEs) model for the model.

The presence of Heteroskedasticity in the panel for the model indicated by the Breuch Pagan/Cook-Weisberg test for heteroskedasticity Chi2 of 27.87 with p-value of 0.0000 is significant at 5% level of significance. This prove that there is presence of heteroskedasticity in the data for the model. Thus, the null hypothesis which states that the residuals have no constant variance and zero mean is not rejected.

The result from the Hausman fixed and random effect test for the model with Chi2 value of 17.70 with p-value of 0.0236 which is statistically significant at 5% level of significance. This implies that the test considered the fixed effect for the model.

The model indicates fixed effect model as the most appropriate for the study but due the presence of heteroscedasticity in the model, a panel corrected standard error (PCSE) model was conducted to correct for heteroscedasticity and autocorrelation which is meant to be suitable. Furthermore, the absence of the perfect multicollinearity among the explanatory variables, as shown by the mean VIF of 1.10 for the model. The decision criterion for the Variance Inflation Factor is that a value of 10 and above implies the presence of perfect multicollinearity.

Regression Results and Hypotheses Testing

The (R^2 value of 0.299) which is explained around 30% of total variation in the profitability as measured by profit before tax (PBT) is caused by liquidity risk, credit risk, operating risk, bank size and board gender. The table also shows that the model is fitted from the F-Statistic of 6.68 and the P-value of 0.0000 which is statistically significant at 1% level of significance.

Summary of PCSEs Regression Result

Variables	Coefficient	Z-Value	P-Value
Liquidity risk	7.455	1.20	0.229
Credit risk	13.844	0.78	0.435
Operating risk	-6.351	-2.67	0.008
Bank size	0.139	0.60	0.547
Board gender	40.917	2.08	0.038
LRG	-27.397	-1.09	0.276
CRG	-168.190	-2.29	0.022
OPRG	-22.549	-2.28	0.022
Constant	4.833	0.66	0.509
R2	0.3482		
F-Statistic (Wald)		62.28	0.0000

Sources: Output Generated Using Stata 13

Financial Risk has no Significant Effect on Profitability

The result of the study revealed a beta coefficient (β) of 7.455447 and P-value of 0.229 at 5% level of significance. The null hypothesis was not rejected and concluded that bank liquidity risk has no significant effect on the study banks profitability. This finding is aligned with the study results of (Ail, Tabari, Ahmadi, & Emami, 2013). Furthermore, the credit risk has a beta coefficient of 13.84442 at a p-value of 0.435 which is insignificant at 5% level of significance.

The study with the research work of (Makokha et al., 2016), (Bogale, 2019), however, the study contradicted the work of (Gathigiamuriithi et al., 2016) (Hamza, 2017), (Serwadda, 2018).

Operating risk reveals a beta coefficient of -6.351913 with p-value of 0.00. This implies that operating risk has a significant negative effect on the profitability of listed deposit money banks in Nigeria. This means that a 1% increase in operating risk will result to 6% decreases in bank profitability. This supports the findings of Bogale, (2019) who found an insignificant and positive effect of operating risk on profitability, but contradicts the findings of However did not allied with the research work of (Makokha et al., 2016).

For liquidity risk, the study reveals an interactive variable between board gender and liquidity risk is negative and insignificant on profitability with a coefficient

value of 27.397 with the p-value of 0.276. The study is supported by the finance distress theory. Furthermore, for credit risk, the regression result reveals an interactive variable between board gender and credit risk is negative and significant on profitability with a coefficient value of -168.190 and p-value of 0.022. This implies that the female board member in the board structure has not properly manage the bank non-performing loan and this has negatively affected the bank profitability. This means that female board member are not strengthens the relationship between the credit risk and profitability, also negatively affecting bank performance. Thus, the study rejects the hypothesis. The study is supported by the finance distress theory.

In the case of operational risk, the study a reveal an interactive variable between board gender and operating risk is negative and significant on profitability with a coefficient value of -22.549 with a p-value of 0.022. This implies that female board member in the board structure has significant role on operating risk, and this has reduced the profitability of the study banks by 22%. This means that female board member contributes negatively on the relationship between the operating risk and profitability, also negatively affecting bank performance. Thus, the study rejects the hypothesis. The study is supported by the finance distress theory.

5. Conclusions and Recommendations

This study concluded the interaction between female board director and credit risk and operating risk was found to be negative and significantly influencing profitability. This means that female directors could not control the high nonperforming and high cost of operations in the banks. In line with the findings of the study, the following recommendations are made; The management of the study bank should ensure they control their liquidity risk through loan supply to customer and encourage the attraction of new customer to deposit. In addition, the banks should effectively review and implement management risk framework in order to reduce the non-performing loan attributed to deposit money banks in Nigeria.

The management of banks should ensure efficient and effective utilization of operating cost, in order not to run at a loss and maintain a better profitability. The bank should avoid unnecessary expenditure that will not yield any returns. Finally, it is recommended that the central bank of Nigeria should encourage

deposit money banks to appoint the right female director in the board of governance.

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