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RISK MANAGEMENT AND PROFITABILITY OF QUOTED BANKS IN NIGERIA

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Abstract:
The role of risk management in the performance of banks cannot be over-emphasized. This study, therefore, examines the effect of risk management on bank profitability in Nigeria by employing correlation analysis, pooled ordinary least square estimate, and fixed and random effect estimations between 2007 and 2020. Secondary data on return on asset (dependent variable), Liquidity risk, Credit Risk, Operational Risk, Market Risk, Capital Risk and Bank size are sourced from annual audited accounts of six deposit money banks listed on NSE. The result reveals that return on asset is negatively impacted by liquidity risk, capital risk and bank size while it significantly and positively impacted marketing risk but insignificantly and positively related to operational risk and credit risk. The study concludes that there is a slight tendency for liquidity risk and capital risk to reduce the return on asset. In Nigeria, credit risk continues to be the biggest threat to commercial banks, making precise measurement and credit risk management absolutely essential. Therefore, it is recommended that managements of listed commercial banks should support sound operational and credit risk management. This is paramount in order to engender a positive risk culture in line with best global practices that would prevent financial crisis and improve commercial banks' performance in Nigeria, among other countries.

JEL: G21, G32

Keywords: risk management, bank profitability, liquidity risk, credit risk, market risk

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1. Introduction

Banks play a crucial role in all financial systems and economies all over the world. They boost economic efficiency and channels excess funds to deficit units. Commercial banks are lenders to typically enterprises, governments, and individual families, through bonds, money, equities markets, and other intermediaries such as mutual funds, insurance firms, and pension funds (Inegbedion, Vincent & Obadiaru, 2020). Large banks lend to a variety of their clients and carry out this activity "*considering profitability, liquidity, and solvency*" (Olokoyo, 2011). However, in pursuing corporate goals, banks face some fundamental risks such as credit risk, market risk, liquidity risk, and operational risks while inadequate management of these risks exposes banks to losses and may undermine their viability as businesses, affecting the financial system as a whole. However, liquidity, credit, market, and non-financial risks are common to all firms (Kassi, Rathnayake, Louembe, & Ding, 2019).

In today's dynamic global environment, risk management is crucial. Banks are economic powerhouses that take huge risks. In providing financial services, they assume numerous financial risks, thus their risk management procedures need additional study. Also, due to the rapid growth of computer technology, which generates new business prospects and an unstable economic climate, risk management is gaining attention in the financial sector. For instance, Panda & Hota (2014) accentuates that credit risk threatens commercial banks' credibility which signifies the inability of lenders to pay the money lent to them including the interest. Many Nigerian deposit money banks often face this risk which has resulted in to increase in nonperforming loans and a reduction in profits generated. Consequently, credit risk management is seen as key to minimizing bad debts because bank loans targeted at boosting profitability have led to toxic debts in Nigerian banks due to poor management (Uwuigbe, Uwuigbe & Oyewo, 2015). Profitability indicates a bank's risk tolerance and measures a company's growth. All banks in the world have to increase their overall performance and profitability to improve their position in the world's financial institutions. However, each bank's profitability depends on its management and the markets it serves to assess risk (Alzorqan, 2014, Ismail & Abd Samad & Romaiha, 2018). Therefore, to ensure profitability in the rendering of banking services, especially in Nigerian banks, risks must be properly identified and managed.

In Nigeria, this study is worth considering due to the alarming rate of non-performing loan rates, insufficient liquidity, forgeries and fraud despite several reforms and restrictions put in place. For instance, the increase in minimum capital requirements, introduction of new leverage and liquidity management policies to restrict excessive borrowing and risky practices and development of additional strategies to cushion banks as their balance sheets were changed by the Central bank of Nigeria almost prove abortive. Moreover, in developing nations like Nigeria, where financial complexity is low and risk management is essential to boosting earnings, there is a need for further investigation into how risk management techniques have impacted banks.

In light of this, this study investigates how risk management affects bank profitability in Nigeria as there is the paucity of work in developing countries with

divergent results. Also, considering the rapid and overwhelming shock of the coronavirus epidemic since February 2020, this study seeks to determine the impact of various risk on the performance of Nigerian deposit money banks considering the pandemic period.

2. Literature Review

Profitability is the ability to profit from an organization's business activities. It measures management efficiency in adding business value with organizational resources (Soyemi, Ogunleye & Ashogbon, 2014). Profitability is the relationship between income and a balance sheet measure that indicates asset income potential. Investors, stakeholders, and the economy rely on bank profitability to accrue returns. Bank performance, therefore, is the ability to reach goals with available resources. It entails periodic and systematic evaluations of company goals (Amelia, 2012). Profitability indicates banks' risk-taking and capital-raising abilities. It measures banks' management and competitiveness. Despite being an important aspect of business, profitability can be hampered by window dressing and different accounting principles (Aduda, 2011) which constitute a risk to the banks.

Consequently, risk management, according to Van Gestel and Baesens (2008), strives to lessen earnings volatility and prevent significant losses. But for proper management of risk to existing, there is a need to engage in the process of risk Identification, measurement, treatment, and implementation. More so, as a result of the huge risk shouldered by financial institutions, the issue of risk management has become a subject of discourse among several researchers in banks with divergent results.

A study carried out by Li and Zou (2014) investigated credit risk management and European commercial bank profitability. This study looked at forty-seven of Europe's top commercial banks from 2007 to 2012. Profitability and credit risk management were proxied by ROA, ROE, and NPLR. According to the authors, credit risk management didn't increase bank profits. ROA and ROE had a strong connection with NPLRs, whereas CARs had an insignificant relationship with ROA and ROE. Yousfi (2014) assessed how risk management techniques affected Jordanian Islamic banks' performance from 1998 to 2012. The fixed effect results show that market risk management has a statistically positive influence on performance, whereas liquidity, credit, and operational risk management have a statistically negative impact on performance (ROA and ROE). Olusanmi, Uwuigbe, and Uwuigbe (2015) examined the relationship between risk management and the financial performance of Nigerian banks. The six-year data set covered 14 banks listed on the Nigerian Stock Exchange (2006-2012). The dependent variable was Return on Equity (ROE), while the explanatory factors were Non-performing loan ratio, Capital Ratio, Loan to Total Deposit, and Risk Disclosure. Using ordinary least square regression, it was determined that the correlation between risk management proxies and bank performance is negative and insignificant. Abel (2016) studied Zimbabwe's banking sector profitability and found that bank management and liquidity boost banking profitability in Zimbabwe.

Saeed and Zahid (2016) looked at the effect of credit risk on bank profitability. According to the author, credit risk is the most hazardous variable that can cause problems for banks. The author concludes that there is a positive correlation between bank size, leverage, and growth while profitability and credit risk are unrelated. Nisrul & Azhar (2017) studied capital adequacy ratio, non-performing loans, and bank size. We observed a positive and substantial influence of CAR and bank size on ROA using panel data regression analysis on 30 Indonesian commercial banks from 2011-2015 while NPL hindered ROA. Alqisie (2018) examined how risk management affects Jordanian banks' profitability. The study found that the overall risk management techniques account for a sizable portion of the difference in bank profitability. The findings also demonstrated that only operational risk management strategies had a major impact on profitability, with little or no impact on liquidity, credit, or market risks.

Chukwunulu, Ezeabasili, and Igbodika (2019) investigated the influence of risk management on the performance of Nigerian banks. Credit risk has a significant negative impact on return on equity and a moderate negative impact on return on assets. The performance of a bank is unaffected by liquidity management and operational risk. Inegbedion, Vincent, and Obadiaru (2020) examined the risk management and financial performance of commercial banks in Nigeria. The longitudinal study analyzed data using GMM and the Vector Error Correction Model. The profitability of banks is affected by short-term liquidity risk and long-term credit, capital adequacy, leverage, and liquidity risk. The profitability of ROA is positively associated with liquidity risk but adversely with credit risk.

Ikponmwosa (2020) addresses risk management and Nigerian bank profitability. The study found that loan loss provision to total assets positively affects Nigerian banks' profitability, but the loan-to-deposit ratio had a minor beneficial effect. Capital adequacy and non-performing loans impair Nigerian bank profitability. In Nigeria, bank size and profitability were unrelated, according to the study. Credit risk affects Nigerian banks' profitability, according to empirical studies. Credits and advances and non-performing advances have a negative relationship with bank profitability, which raises banking risk in Nigeria. To support Ikponmwosa (2020), the study of Sulaiman, Adejayan & Dada (2021) on the factors influencing deposit money banks' lending in Nigeria, considering consolidation and interactive effect on credit to private sectors revealed that Non-performing loans exert a negative effect after consolidation, though positive prior to consolidation. The study also discovered that total savings and the number of bank branches have a significant multiplicative effect on bank lending in Nigeria.

Contrary to previous studies, Ugah (2021) used a well-structured questionnaire to collect data for the study and looked at Access Bank's financial risk management and bank profitability in Nigeria. The findings from the study indicate that the return on assets of Access Bank Nigeria Plc. is significantly impacted positively by liquidity risk, credit risk, interest risk, and inflation risk. In order to maximize their profit, the study suggested banks adopt proactive measures to lower financial risks.

This study revealed some precincts, such as inadequate studies from developing countries on Nigeria's banking sector. Again, most Nigerian studies used regression

without considering a homogenous cross-section of banks, except Ikponmwosa's (2020). So, the direction of the relationship between the dependent variable (profitability) and the independent variables (risk management) was not considered, and a similar study is needed in Nigeria. Therefore, this study aims to fill a gap in the literature by incorporating capital risk and using panel-based estimation techniques to select the most consistent and efficient estimators after incorporating commercial banks' heterogeneity.

3. Methodology

This study includes the 22 commercial banks listed on Nigeria Stock Exchange in December 2020. Commercial banks were chosen based on the availability of annual audited accounts, a requirement for all listed companies. Six commercial banks listed on NSE for the last 14 years (2007-2020) were selected using purposeful sampling. The sampled banks were selected from tier 1 (Access Bank Plc, GTBank Plc, UBA Plc and First Bank Plc.) and Tier 2 (FCMB Plc. and Sterling Bank Plc) CBN classification of banks. The sampling technique was the best because it sets inclusion and exclusion criteria for commercial banks in the study. Tarus and Omandi (2013) argued that a five-year period would lead to a small sample size, so they recommended a 14-year period.

The works of Ng'aari (2016) are modified for this study by including Market and Capital Risk while the control variable is Bank Size (BZ). Pooled OLS, Fixed Effect, and Random Effect were used to estimate the model.

Thus, the model is specified as follows:

$$\text{ROA} = f(LR, CR, OR, MR, CAPR, BZ, \epsilon) \quad 3.1$$

Expressing equation (3.1) in econometric form; we have;

3.1 Pooled OLS Model

$$ROA_{it} = \beta_0 + \beta_1 LR_{it} + \beta_2 CR_{it} + \beta_3 OR_{it} + \beta_4 MR_{it} + \beta_5 CAPR_{it} + \beta_6 BZ_{it} + \varepsilon_{it} \quad 3.2$$

3.2 Least Square Dummy Variable (LSDV) Fixed Effect Model

$$ROA_{it} = \beta_0 + \sum_{i=2}^{14} \beta_1 LR_{it} + \beta_2 CR_{it} + \beta_3 OR_{it} + \beta_4 MR_{it} + \beta_5 CAPR_{it} + \beta_6 BZ_{it} + \varepsilon_{it} \quad 3.3$$

3.3 Random Effect Model

$$lnROA_{it} = \beta_0 + \beta_1 lnLR_{it} + \beta_2 lnCR_{it} + \beta_3 lnOR_{it} + \beta_4 lnMR_{it} + \beta_5 lnCAPR_{it} + \beta_6 lnBZ_{it} + \mu_i \quad 3.4$$

Where:
ROA_{it} = Return on Asset of Bank i in year t;
LR_{it} = Liquidity Risk of Bank i in year t;
CR_{it} = Credit Risk of Bank i in year t;

OR_{it} = Operational Risk of Bank i in year t;
MR_{it} = Market Risk of Bank i in year t;
CAPR = Capital Risk of Bank I in year t;
BZ_{it} = Size of Bank i in year t;
ε_{it} = the error time;
μ_i = cross sectional effects subsumed into the error term of the random effect model;
β_0 and α_0 are constants of the corresponding estimated equations, β_1 to β_6 and $\alpha_1$to α_6 are all parameter estimates of the corresponding estimated equations.

The study uses descriptive statistics, correlation analysis, panel data using pooled OLS estimator, fixed effect estimator, and random effect estimator, and post estimation techniques to achieve the objectives of this study.

After estimation, it's expected that all the tested variables (Liquidity risk, Credit Risk, Operational Risk, Market Risk, Capital Risk) except Bank size exert negative and significant effect on the profitability of Nigerian Deposit money Banks (Return on Assets).

Summarily, it's expected that:

LR, CR, OR, MR, CAPR< 0, BZ > 0

4. Results

Table 1: Descriptive Statistics

Stats	ROA	LR	CR	OR	MR	CAPR	BZ
Mean	.0510537	2.564826	.1820014	25.50117	.056456	.2174499	.6910074
Median	.0404939	.5192733	.0558687	1.184999	.0404939	.1356547	.3631245
Min	4.2E-05	0.018426	0.004552	0.046515	4.2E-05	0.003991	0.01136
Max	.6349779	163.2185	1.670494	1124.487	.6349779	1.382558	20.39964
Variance	.0053689	315.312	.0759364	18179.95	.007907	.0663526	5.265541
Sd	.0732729	17.75703	.2755656	134.833	.0889213	.2575899	2.294677
Skewness	6.129971	8.974511	2.673427	7.021877	4.939956	2.876083	7.829938
Kurtosis	49.29989	81.69694	12.24053	55.10569	30.34368	11.16074	66.64966
Obs	84	84	84	84	84	84	84

Source: Author's Computation (2021).

Descriptive statistics presented in Table 1 revealed the mean, median, maximum, minimum, variance, standard deviation, skewness and kurtosis of the observations collated across the bank sampled in the study over time. The table depicted that operation risk (OR) has the highest mean and median value of 25.50117 and 1.184999 as well as the most volatile variable in the model with a standard deviation value of 134.833. The table further revealed that ROA, LR, CR, OR, MR, CAPR and BZ were leptokurtic in nature since the kurtosis values of all the variables is >3. Statistics presented above described each of the variables as pooled over 6 quoted banks including Access Bank Plc, Gtbank Plc, FCMB Plc, UBA Plc, Sterling Bank Plc and First Bank Plc, over a period of 14 years (2007-2020).

Table 2: Correlation Statistics

	ROA	LR	CR	OR	MR	CAPR	BZ
ROA	1.0000						
ROE	0.2046						
LR	-0.0808	1.0000					
CR	-0.0581	-0.0669	1.0000				
OR	-0.1229	-0.0211	-0.0951	1.0000			
MR	0.8290	-0.0752	0.0515	-0.1150	1.0000		
CAPR	-0.1743	-0.0320	0.1527	0.0011	-0.1742	1.0000	
BZ	0.0113	0.0043	-0.0913	0.0083	-0.0040	0.3929	1.0000

Source: Author's Computation (2022).

The result presented in Table 2 shows that there is positive relationship between ROA, MR and BZ. Specifically, correlation coefficient stood at 0.2046 for ROA and ROE, 0.8290 for ROA and MR, while the correlation coefficient of ROA and BZ stood at 0.0113. This result indicated that ROA move in the same direction with, MR and BZ, hence, an increase in ROA will also lead to an increase in MR and BZ and vice versa. In another direction, the correlation between ROA and variables like LR, CR, OR and CAPR is negative with coefficient values of -0.0808, -0.0581, -0.1229 and -0.1743 respectively. This result reflects that ROA move in different direction with LR, CR, OR and CAPR.

Table 3: Pooled OLS Estimation Result

Source	SS	Df	MS		Number of obs = 84	
					F(6, 77) = 29.91	
Model	.311833477	6	.051972246		Prob > F = 0.0000	
Residual	.133786539	77	.001737488		R-squared = 0.6998	
					Adj R-squared = 0.6764	
Total	.445620016	83	.005368916		Root MSE = .04168	
ROA	**Coef.**	**Std. Err.**	**t**	**P>t**	**95% Conf.**	**Interval**
LR	-.0001123	.0002593	-0.43	0.666	-.0006286	.000404
CR	-.0271464	.0172057	-1.58	0.119	-.0614072	.0071145
OR	-.0000209	.0000343	-0.61	0.545	-.0000892	.0000475
MR	.6792313	.0531344	12.78	0.000	.5734272	.7850355
CAPR	-.0056888	.0201817	-0.28	0.779	-.0458756	.0344981
BZ	.0003276	.0022083	0.15	0.882	-.0040697	.0047249
_cons	.0194789	.0075743	2.57	0.012	.0043966	.0345612

Source: Author's Computation (2022)

Pooled estimation result presented in Table 3 depicted that the impact of LR on ROA is negative and insignificant, with an estimate of -.0001123(p=.0666 >0.05), CR exerts an insignificant negative impact on ROA, with an estimate of -.0271464(p= 0.119 >0.05), the impact of OR on ROA is negative and insignificant with an estimate -.0000209(p=0.545 >0.05), the impact of MR on ROA is positive and significant with an estimate of .6792313(p=0.000 <0.05), impact of CAPR is negative and insignificant with estimate -.0056888(p=0.779 >0.05), while bank's size exert positive insignificant impact on ROA. The table also showed an R-square statistic of 70% of the systematic variation in return on asset (ROA) of quoted sampled banks can be jointly explained by liquidity risk, credit

risk, operational risk, market risk, capital risk and bank size. However, the observed impact of risk management variables (liquidity risk, credit risk, operational risk, market risk, capital risk and bank size) on Profitability variable (Return on asset) could have been affected by the restriction placed on the pooled OLS estimation that there is no heterogeneity effect across either bank or over time, however, to ascertain such effect the study will lift the restriction by incorporating heterogeneity effect measure into the model both across banks sampled and over the period under review.

4.1 Fixed Effect Estimation

Fixed effect estimations account for the uniqueness among banks over time in the discourse of return on asset by incorporating heterogeneity effect across banks, over time, into the estimated model. This study used a dummy variable technique, where each bank assigned an intercept term as a dummy variable, to independently incorporate the banks' heterogeneity effect and time into the model. Table 4 provides fixed effect estimates (cross section).

Table 4: Fixed Effects Estimates

Source	**SS**	**Df**	**MS**		**Number of obs = 84**	
					F(11, 72) = 17.48	
Model	.3241985	11	.029472591		Prob > F = 0.0000	
Residual	.121421517	72	.00168641		R-squared = 0.7275	
					Adj R-squared = 0.6859	
Total	.445620016	83	.005368916		Root MSE = .04107	
ROA	**Coef.**	**Std. Err.**	**t**	**P>t**	**95% Conf.**	**Interval**
LR	-.0000134	.0002793	-0.05	0.962	-.0005701	.0005434
CR	-.0085558	.0213541	-0.40	0.690	-.0511244	.0340127
OR	-2.15e-06	.0000396	-0.05	0.957	-.0000812	.0000769
MR	.6437682	.0552692	11.65	0.000	.533591	.7539454
CAPR	.0048104	.0252745	0.19	0.850	-.0455733	.0551942
BZ	.0009758	.002226	0.44	0.662	-.0034617	.0054133
ID						
Gtbank	.0207585	.015909	1.30	0.196	-.0109555	.0524725
FCMB	-.0111899	.0218876	-0.51	0.611	-.0548219	.0324422
UBA	-.0048622	.0158646	-0.31	0.760	-.0364876	.0267633
Sterling	-.0150289	.0187638	-0.80	0.426	-.0524339	.0223762
First Bank	.0214585	.0159465	1.35	0.183	-.0103303	.0532473
_cons	.0127789	.0115747	1.10	0.273	-.0102948	.0358527

Source: Author's Computation (2022).

Fixed cross sectional specific estimation result presented in Table 4 depicted that the impact of LR on ROA is negative and insignificant, with an estimate of -.0000134(p=0.962 >0.05), CR exerts insignificant negative impact on ROA, with an estimate of -.0085558(p= 0.690 >0.05), impact of OR on ROA is negative and insignificant with an estimate -2.15e-06(p=0.957 >0.05), impact of MR on ROA is positive and significant with estimate of .6437682 (p=0.000 <0.05), impact of CAPR is positive and insignificant with estimate .0048104(p=0.850 >0.05), while bank's size exert positive insignificant impact on ROA

with coefficient .0009758(p=0.662 >0.05). The table also showed an R-square value for cross sectional specific estimation stood at 0.7275 which reflect that about 73% of the systematic variation in return on asset (ROA) of quoted sampled banks in the study can be explained by liquidity risk, credit risk, operational risk, market risk, capital risk and bank size when heterogeneity effect across firms is incorporated into corresponding intercept terms.

Deviation from the intercept term (.0127789) corresponding to the reference bank (Access bank) stood at .0207585, -.0111899, -.0048622, -.0150289 and .0214585 for Gtbank Plc, FCMB Plc, UBA Plc, Sterling Bank Plc and First Bank Plc respectively.

4.2 Random Effect Estimation

Table 5: Random Effect Estimation

Random-coefficients			**Regression**		**Number of obs =84**	
Group variable: ID			Number of groups =		6	
			Obs per group:			
			min =		14	
			avg =		14.0	
			max =		14	
			Wald chi2(6) =		203010.38	
			Prob > chi2 =		0.00	
ROA	**Coef.**	**Std. Err.**	**Z**	**P>z**	**[95% Conf.**	**Interval]**
LR	-.002676	.0026718	-1.00	0.317	-.0079126	.0025606
CR	.0002829	.0004014	0.70	0.481	-.0005038	.0010697
OR	.0000501	.0000485	1.03	0.302	-.000045	.0001452
MR	.8383418	.1628979	5.15	0.000	.5190678	1.157616
CAPR	-.0096639	.0097144	-0.99	0.320	-.0287039	.0093761
BZ	-.0065691	.0065558	-1.00	0.316	-.0194183	.00628
_cons	.0105918	.0107481	0.99	0.324	-.010474	.0316577
Test of parameter constancy: chi2 (35) = 2143.02; Prob > chi2 = 0.0000						

Source: Author's Computation (2022).

Random effect estimation result presented in Table 5 depicted that the impact of LR on ROA is negative and insignificant, with an estimate of -.002676 (p=0.317>0.05), CR exerts insignificant positive impact on ROA, with an estimate of .0002829 (p= 0.481>0.05), impact of OR on ROA is positive and insignificant with an estimate .0000501 (p=0.302>0.05), impact of MR on ROA is positive and significant with estimate of .8383418 (p=0.000 <0.05), impact of CAPR is negative and insignificant with estimate -.0096639(p=0.320>0.05), while bank's size also exert negative insignificant impact on ROA with coefficient -.0065691(p=0.316>0.05).

4.3 Post Estimation Test

Table 6: Restricted F Test of Heterogeneity

	F-statistics	**Prob**
Cross Sectional	29.344	0.000

Source: Author's Computation (2022).

F- Statistics reported in Table 6 stood at 29.344 and with probability values of 0.000. This result showed that there is enough evidence to reject the null hypothesis that all differential intercept corresponding to each sectional specific units (quoted banks) are equal to zero. This implies that there is significant cross sectional heterogeneity effect amidst the sampled quoted banks, thus invalidating the restriction of pooled OLS estimate, in favour of cross-sectional fixed effect estimation.

Table 7: Hausman Test

Null hypothesis	Chi-square	Prob
Difference in coefficient not systematic	1.945	0.679

Source: Author's Computation (2022).

Table 7 showed a chi-square value of 1.945 with a probability of 0.679>0.05 level of significance. This result indicated that there is no statistical evidence to reject the null hypothesis that differences in coefficients of fixed and random effect estimation are not significant. Hence, the most consistent and efficient result is given by the random effect estimator employed in Table 5. The estimation that best explained the interconnection between risk management variables which is the focus of this section is the random effect estimation result that revealed that the impact of LR, CAR and Bank Size on ROA is negative and insignificant, CR and OR exerts insignificant positive impact on ROA while only MR has positive and significant relationship with ROA.

5. Discussion of Findings

In the study, the impact of liquidity risk, credit risk, operational risk, market risk, capital risk, and bank size on return on asset was investigated.

The estimation results revealed that liquidity risk has a negative and insignificant impact on return on asset. This means that return on asset will decline as there exist an increase in liquidity risk paid by quoted banks. High liquidity risk in banks push commercial banks to borrow emergency funds at high cost, resulting in higher margins due to interest expense. By implication, high costs is paid by banks to compensate for the risk premium thereby reducing their return. This shows that liquidity risk does not position quoted commercial banks for increased profit. This finding agrees with Chukwunulu, Ezeabasili, and Igbodika (2019), who found a negative and insignificant relationship between liquidity risk and bank performance in Nigeria, but disagrees with Ofosu- Hene and Amoh (2016), who found a positive relationship. It was also observed that, capital risk had a negative and insignificant impact on return on asset. Increasing capital risk of the quoted bank in Nigeria can reduce the end-of-year profit. Aduda and Gitonga (2011) in Kenya found a link between capital risk and profitability. Li and Zou (2014) found a fluctuating relationship between credit risk management and bank profit in Europe.

On the other hand, marketing risk has a significant positive impact on return on asset of quoted commercial banks sampled in the study. This means that an increase in

marketing risk will lead to a substantial increase in return on asset by quoted commercial banks in Nigeria. This discovery suggests that the more marketing risk quoted commercial banks pay, the higher the likelihood of increasing profitability for the year and vice versa. This could be as a result of increase in the lending rate which serves as a cushion for the market risk experienced by the banks. Also, Operational risk affects return on assets positively but insignificantly. Sound operational risk management practices boost commercial bank profitability. This result agrees with Bekele (2015), Simamora and Oswari (2019), Ali, Bagram & Ali (2018), Muriithi (2016), and Ng'aari (2016). The results showed that operational risk management practices positively affect Nigerian commercial banks' financial performance.

It is expected that the increase in size of a bank would increase its capacity to render profitable services, therefore, the insignificant negative impact of bank size emanating from the result, calls for attention as a result of its deviation from expected result, that is, a positive and significant effect. This is not in tandem with the works of Nisrul & Azhar (2017). Credit risk also reveals a negative and insignificant effect on banks profitability as also revealed in the study of Ikponmwosa (2020). By implication, default in loan repayment with interest by bank customers would impair the profitability rate of banks and lead to bank distress.

6. Conclusion and Recommendations

The outcome from this study provides that an increase in marketing risk has a substantial impact on return on asset by quoted commercial banks sampled in the study, which reflects that the more marketing risk in the total risk paid by quoted banks, the higher the bank's annual profitability. For emphasis, increasing marketing risk is essential for Nigerian deposit money banks to increase profits.

The study also found an insignificant negative relationship between liquidity risk and return on assets of the sampled commercial bank. Thus, liquidity risk slightly reduces ROA. The results also showed a negative, insignificant relationship between credit risk and return on assets, indicating a correlation with profitability. Credit risk is the biggest risk commercial banks in Nigeria face, so accurate measurement and management are crucial. Given that unprofitable loans reduce a bank's profitability, the relationship between credit risk and profitability was expected to be negative.

Sequel to the findings, this study recommends that management of quoted commercial banks should promote sound operational risk management. This is paramount in order to engender a positive risk culture in line with best global practices that would prevent financial crisis and improve commercial banks' performance in Nigeria. Commercial banks should, also train board members and management on risk management and invest in risk management software to quickly identify, analyze, and report risk events for management information and decision making.

Conflict of Interest Statement

The authors declare no conflicts of interest.

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References

Abel, S. (2016). Determinants of Banking Sector Profitability in Zimbabwe. International Journal of Economics and Financial Issues, 845-854.

Adeusi, S. O., Akeke, N. I., Adebisi, O. S. & Oladunjoye, O. (2014). Risk management and financial performance of banks in Nigeria. European Journal of Business and Management, 6 (31), 336 – 342.

Aduda, J. & Gitonga, J. (2011). The relationship between credit risk management and profitability among commercial banks in Kenya. Journal of Modern Accounting and Auditing, 7(9):934-946.

Ali, N., Bagram, M. M. & Ali, H. (2018). Critical role of risk management and its impact on bank performance in Pakistan. *Journal of Business and Tourism*, 4(1), 22-32.

Alqisie, A. (2018). Does Profitability of Jordanian Commercial Banks Get Affected by Risk Management Practices? *European Journal of Scientific Research, 148*(3), 319-332.

Alzorqan, S. T. (2014). Bank liquidity risk and performance: an empirical study of the banking system in Jordan, *Research Journal of Finance and Accounting, 5* (12): 155-164.

Amelia, M. R. (2012). Effect of firm characteristics, financial performance and environmental performance on corporate social responsibility disclosure intensity on manufacturing firm listed in the Indonesia Stock Exchange. Faculty of Economy, Gunadarma University.

Bekele, B. (2015). The nexus between bank specific risk management practice and financial performance: A study on selected commercial banks in Ethiopia. [Online] SSRN Electronic Journal.

Chukwunulu, I. J., Ezeabasili, V. N., & Igbodika M. N. (2019). Risk Management and the Performance of Commercial Banks in Nigeria (1994-2016). IIARD International Journal of Banking and Finance Research 5(1)

Hull, John (2012). Risk Management and Financial Institutions, + Web Site, 3rd Edition. John Wiley & Sons

Imane, Y. (2014). Risk Management Practices and Financial Performance in Jordan: Empirical Evidence from Islamic Banks. International conference: Products and applications of innovation and financial engineering between the traditional financial industry and the Islamic financial industry, ISRA. Available at: http://www.kantakji.com/risk-management/riskmanagement-practices-and-financial-performance-in-Jordan-empirical-evidence.

Inegbedion, H., Vincent, B. D., & Obadiaru, E. (2020). Risk Management and the Financial Performance of Banks in Nigeria. *International Journal of Financial Research, 11*(5).

Ikponmwosa, A. N. (2020). The Impact of Risk Management on the Profitability of Banks in Nigeria, *World Journal of Innovative Research (WJIR) 9*(1), 47-52

Ismail, W. M. B. W., Abd Samad, K., & Romaiha, N. R. (2018). The Impact of Financial Risks on the Performance of Islamic Banks in Malaysia, e-Proceedings of the Global Conference on Islamic Economics and Finance, 169-181.

Kassi, D. F., Rathnayake, D. N., Louembe, P. A., & Ding, N. (2019). Market risk and financial performance of non-financial companies listed on the Moroccan stock exchange. *Risks, 7*(1), 1-29

Li, F. & Zou, Y. (2014). Impact of Credit Risk Management on Profitability of Commercial Banks. A study of Europe. Umea School of Business and Economics.

Mitku, E., (2016). Risk Management and Its Impact on Financial Performance of Commercial Banks in Ethiopia. A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Science in Accounting and Finance. Addis Ababa University

Muriithi, J. G. (2016). Effect of financial risk on financial performance of commercial banks in Kenya.

Ng'aari, E. W. (2016). Effect of risk management practices on profitability of listed commercial banks in Kenya. Retrived from http://41.89.49.13:8080/xmlui/bitstream/handle/123456789/1157/Ngaari-Effect%20Of%20Risk%20Management%20Practices%20On%20The%20Profitability%20Of%20Listed%20Commercial%20Banks%20In%20Kenya.pdf?sequence=1&isAllowed=y

Nisrul, I., & Azhar, M. (2017). The Impact of Risk Management and Bank Size on Profitability of Commercial Banking in Indonesia. *Advances in Economics, Business and Management Research* (AEBMR), 46. 1st Economics and Business International Conference

Ofosu-Hene, D. & Amoh, P. (2016). Risk management and performance of listed banks in Ghana, *European Journal of Business Science and Technology*, *2*(2), 107 – 121.

Olokoyo, F. O. (2011). Determinants of commercial banks' lending behaviour in Nigeria. International Journal of Financial Research, 2(2), 60-72.

Olusanmi, O., Uwuigbe, U. & Uwuigbe, O. R. (2015). The Effect of Risk Management on Bank's Financial Performance in Nigeria. Journal of Accounting and Auditing: Research & Practice, 23,112-124

Ongore, V. O. & Kusa, G. B. (2013). Determinants of financial performance of commercial banks in Kenya, *International Journal of Economics and Financial Issues, 3*(1): 237-252.

Panda, M. R. & Hota, D. P. K. (2014). An empirical study of the key determinants of competition in Indonesia banking sector. *Global Journal of Commerce and Management Perspective.*

Pyle, D. H. (1997). Bank risk management: theory, paper presented at risk management and regulation in banking, Jerusalem, May 17-19. Berkely: Research Program in Finance

Saeed, M. S. & Zahid, N. (2016). The impact of credit risk on profitability of the commercial banks. *Journal of Business and Financial Affairs, 5*(2): 192. Available from: https://ssrn.com/abstract=2938546.

Santomero, A. M. (1995. Financial Risk Management: The Whys and Hows, *Financial Markets, Institutions and Instruments 4*(5):1-14.

Santomero, A. M. (1997). Commercial Bank Risk Management: An Analysis of the Process, Journal of Financial Services Research

Simamora, R. J., Oswari, T. (2019). The effects of credit risk, operational risk and liquidity risk on the financial performance of banks listed in Indonesian stock exchange, *International Journal of Economics, Commerce and Management, 7*(5), 182-193

Smith, C. (1995). Corporate Risk Management: Theory and Practice. *The Journal of Derivatives, 2*(4), 21-30.

Soyemi, K. A., Ogunleye, J. O. & Ashogbon, F. O. (2014). Risk management practices and financial performance: evidence from the Nigerian deposit money banks (DMBs), *the Business & Management Review,* 4 (4), 345 – 354.

Sulaiman, L. A., Adejayan, A. O. & Dada, S.O. (2021). Investigating the Factors Influencing Commercial Bank Lending in Nigeria: A Consolidation and Interaction Effect, *International Journal of Humanities & Social Studies, 9*(5), 259-264.

Ugah, J. (2021). Financial Risks Management and Bank Profitability in Nigeria: Case of Access Bank of Nigeria Plc, *International Journal of Research and Innovation in Social Science (IJRISS) 4*(9), 184-190.

Uwuigbe, U., Uwuigbe, O. R., & Oyewo, B. (2015). Credit management and banks' performance of listed banks in Nigeria, *Journal of Economics and Sustainable Development, 6*(2), 27-32.

Van Gestel, T., & Baesens, B, (2008). Credit Risk Management: Basic Concepts: Financial Risk Components, Rating Analysis, Models, Economic and Regulatory Capital, OUP Catalogue, Oxford University Press, number 9780199545117.

Yousfi, I. (2014). Risk Management Practices and Financial Performance in Jordan: Empirical Evidence from Islamic Banks. *International Shari'ah Research Academy for Islamic Finance*, 6(5), 1–24.