



Effect of Prominent Asset Liability Management Risk Components on the Financial performance of Nigerian Commercial Banks

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ABSTRACT

Asset liability management (ALM) policies of most commercial banks comprise of various risks components, Still only three (i.e. liquidity risk, credit risk and interest rate) are said to be prominent, and, most existing studies relating to ALM of banks, have omitted some of these key risks. The study is on the effect of prominent asset liability management risk components on the financial performance of banks in Nigeria, the study adopted pool regression analysis, mean, etc. The data for the study were obtained from annual reports of the banks in Nigeria, and purposive sampling techniques was used to select them. The findings of the study revealed that, the three prominent asset liability management risk component had a statistically significant impact on financial performance of the banks because all the P-values (i.e.0.0054,0.0179 and 0.0010) of this variables obtained from the pool regression analysis were < 5%. The study concluded that management of commercial banks must ensure that these three prominent ALM risk components are part of their asset liability management policies, since, they have direct effect on the financial performance of the bank.

Keywords: Asset Liability Management, Liquidity Risk, Interest Rate Risk, Credit Risk, Financial Performance

JEL Classifications: G2

1. INTRODUCTION

Commercial banks in Nigeria (also called deposit money banks) play a fundamental role in the economic development of the country, because, without their funding strategies and initiatives, industrial growth will be difficult to achieve (Ilmiani and Meliza, 2022). Also, the development of a nation depends on how efficiently and effectively it organises its financial system, because, within the country's financial system, are the banks, who perform financial intermediary roles that help the government achieve its proposed economic growth and stability. (Kaluarachchi et al., 2021).

This financial intermediary function rendered by the bank, often exposes the banks to some risks, which could affect their asset liability management policies as well as their financial performance, since both asset liability management of banks and financial performance have direct influence on each other. Some of the risks that the commercial banks are exposed to as a result of the financial intermediary services,they render include liquidity risk, credit risk, interest rate risk, foreign exchange risk, and capital market risk, to mention a few. However, all these risks are also incorporated in the scope of asset liability management of commercial banks (Deventer and Mesler, 2004; Choudhry, 2007), since, asset liability management structures often serve as

a vehicle for the improvement of the banks' financial performance. Furthermore, Qudat and Alli, (2021) posited that all these risks taken by the banks are not entirely detrimental to them, because, they either expose the banks to unanticipated losses or serve as an avenue to generate more income. Asset liability management is essential to the financial performance of banks because, it is a strategic risk management strategy that helps the banks mitigate possible financial losses, thereby enhancing their financial performance.

In addition, studies, such as (Kazeem and Adeoye, 2020; Francis, 2007), have emphasised that the prominent asset liability management risk components that constitute a major part of banks' operations are liquidity risk, interest rate risk, and credit risk. This also implies that studies examining the effect of asset liability management on the financial performance of banks should incorporate these prominent asset liability management risk components (i.e., liquidity risk, credit risk, interest rate risk) in their statistical analysis, since, the banks financial intermediary services and other sensitive services rendered by them are often exposed to these risks.

However, studies, examining the extent, to which asset liability management affects the financial performance of commercial banks, such as (Anjili, 2014; Thuku, 2015; Ajibola, 2016; Veena and Pragathi, 2018) in Sub-Saharan Africa and Asia, only used credit risk and liquidity risk variables to explain the influence of asset liability management on the financial performance of the bank but, neglected the interest rate risk, which is also among the prominent asset liability management risk components affecting the financial performance of banks. Therefore, this study is embarked upon to incorporate these three prominent asset liability management risk components (i.e., liquidity risk, credit risk, and interest rate risk) into the statistical analysis of asset liability management and financial performance of banks, since, this has not been included in existing studies on the subject. This is the research gap that is addressed by this study.

2. LITERATURE REVIEW

Asset liability management can simply be described as the management of the bank's assets and liabilities of the bank's by the board of directors of the bank (Choudhry, 2011). Asset liability management was measured in this study using liquidity risk (Arif and Anees, 2012), credit risk (Chen et al., 2019), and interest rate risk (Brick, 2012). Customer deposits represented liquidity risk, credit risk was defined by loans and advances from the bank, and interest rate risk was determined using the prevailing interest rate of the bank. This was also adopted in the study of Novickyte and Petraityte (2014), who examined the effect of asset liability management on the financial performance of banks since they measured asset liability management with customer deposits, loans, and leverage. However, like other studies conducted in sub-Saharan Africa, they also did not include the interest rate risk variable in their assessment of bank asset liability management.

Performance measurement is a crucial factor that every financial institution considers because it helps them easily navigate the highly

competitive environment where they currently operate and also creates a rapid opportunity for them to appraise their performance over some time objectively (Carpinetti et al., 2008; Hudson et al., 2001; Surjan and Srivastava, 2019). Performance can be defined as a business's capacity to generate optimal returns. Banks introduce measures to improve their financial performance because of the risky nature of their business (Wonglimpiyarat, 2014).

Financial performance is defined as the result of measuring the financial performance of an organisation in monetary terms. The financial performance is measured in this study using return on assets. Return on assets is a financial metric that indicates how well an organisation has utilised its earnings to fund its assets. It is the most commonly used in studies relating to asset liability management because it holistically addresses the fundamentals of corporate performance and operational capacity of the bank (Loi and Khan, 2012; Mohammed, 2017; Al-Matari et al., 2014). However, other asset liability management studies adopted return on equity to measure financial performance. But Mohammed (2017) further reinterred that return on asset is more suitable than return on equity used by some other asset liability management studies because return on equity can be easily manipulated through financial engineering, particularly the equity components of the return on equity's form. Although Benner and Veloso (2008) and McNamara and Duncan (1995) documented that return on assets is not the only optimal financial ratio for determining an asset's earning capability, it is the most dependable, effective, and extensively used financial indicator for determining performance.

Bank size is described as the bank's capacity to earn and maintain a profit over a period of time. (Almazari, 2014; Teimet et al., 2019). It is one of the control variables considered in this study because it certainly affects on financial performance, asset liability management, and board characteristics. However, existing literature on bank size showed that the relationship between bank size and financial performance as well as asset liability management is mixed because Ramalho and Vidigal da Silva (2009) opined that a negative relationship exists between bank size and financial performance, while Siebenbrunner et al. (2017) documented that the effect of bank size on financial performance and risk management, which is also a major part of asset liability management, is positive. Bank size in this study is measured in this study with a logarithm of the total asset, and this was supported by the study of Mester (2010), which claimed that bank size is calculated as a logarithm of total assets.

Financial leverage is defined as the use of debt to finance business operations; it is preferred by most businesses because its inclusion in a given capital structure mix produces a lower weighted average cost of capital, thus improving the bank's returns and consequently leading to improvement in the financial performance (Kenn-Ndubuisi & Onyema, 2018). It is also one of the control variables in this study; it is measured in this study using the ratio of liabilities to assets. Niresh (2012) opined that most bank managers depend on leverage to smoothly carry out their operations because it often has a longer repayment term, thus creating room for financial improvement. Furthermore, Santos et al. (2023) posited that debt financing opens up several opportunities for financial institutions,

some of which include a stable interest rate, tax deductions, and enhanced financial manoeuvrability.

The theoretical framework for this study is the liability management theory propounded by Redington (1952) and Haynes and Kirton (1952). This is because most of the deposit money banks prefer to source money to finance the purchase of their assets as well as the settlement of their liabilities from either the central bank, money market, other commercial banks, or capital markets instead of depending on income that can be generated from the self-liquidating loan granted to customers. This is usually because income from self-liquidated loan granted to customer may be an unstable source of finance in the long term, since, customers of bank have the tendencies to either stop repaying their interest and principal on their loan in the future or may suddenly begin to delay the payment of interest on the loan due to unforeseen circumstances, but, this is not the case when the banks source fiancé of their asset and liabilities from external sources like the central bank, capital market among others, since, they are often given longer repayment period and favorable interest rate, and this tends to protect the bank from liquidity risk since, they will only repay the interest and principal after a long time. This also means that the banks will be protected from fluctuation in customer's behaviour as a result of either the non-payment or delay of customers in repayment of their outstanding interest and principal on their loan, since external sources of borrowing often give a fixed interest rate for their loan repayment.

Finally, the long-term loan sourced from the capital market or central bank also assists the banks to minimise the credit risk exposure of the bank since the banks are usually giving a longer time to invest and reinvest the money so that they can accumulate enough funds before the proposed repayment date. In other words, this theory forms the theoretical framework for this study because it addresses the three prominent risks that constitute the foundation for the study of asset liability management of deposit money banks in Nigeria, as earlier highlighted in the introductory aspect of this study.

The results of the empirical studies on the subject have been mixed and inconclusive. Anjili (2014) used correlation and regression analysis to examine the relationship between asset liability management and financial performance in Kenya and found out that a significant relationship exists between asset liability management and financial performance. The study represents financial performance with return on equity, while asset liability management was represented with capital adequacy ratio, asset quality, operational efficiency, liquidity, and income diversification. The study covered a period of 2004-2013, and it adopted a descriptive methodology using 43 commercial banks in Kenya. The findings of the study revealed that all asset liability management variables in the study had a significant effect on the financial performance of the selected banks considered in the study. Although the author concluded that operational efficiency, one of the variables used to represent asset liability management, had the most significant effect on the financial performance of commercial banks because some of the banks considered in the study had a higher income stream than others.

Thuku (2015) considered a study on the effect of asset liability management on the financial performance of microfinance companies in Kenya within the period of 2010-2014. The study adopted descriptive statistics, regression analysis, and the Pearson correlation statistical method. It represented asset liability management with asset quality and provisions, while the financial performance was measured using return on asset. Furthermore, the study measured the control variable with operational efficiency, liquidity ratio, and bank size. The findings emphasised that there is a negative relationship between asset liability management and profitability of microfinance banks in Kenya. The study concluded that the microfinance banks considered in the study were unable to manage their loans and advances since most of the loans and advances they granted to customers eventually became non-performing loans, and this also negatively affected the asset liability management as well as the financial performance of the banks.

Ajibola (2016) sought to establish the effect of asset liability management on the financial performance of selected Nigerian banks by using regression analysis statistical technique with data obtained from the annual financial statements of banks from 2009 to 2014. The study represented asset liability management with loans and advances, demand deposits, savings, and fixed deposits. The findings of the study revealed that the asset management variables (i.e., loans and advances) have a strong statistical relationship with the variable used to measure financial performance (i.e., return on assets). In contrast, the liability management variables (i.e., demand deposits, saving, and fixed deposits) have a negative relationship with the financial performance variable (i.e., return on assets). The study therefore concluded that deposit money banks should always seek to avoid poor loan management culture, since this has a proportional relationship with the financial performance of deposit money banks.

Kajola et al. (2019) examined the influence of credit management on the financial performance of ten Nigerian listed deposit money banks from 2005 to 2016. The study estimated the data using random effects generalised least squares (GLS) regression. It represented credit management with non-performing loan to total loan ratio (NPLLR), non-performing loan to total deposit ratio (NPLDR), and capital adequacy ratio, while financial performance was proxied with return on assets (ROA) and return on equity (ROE). The study recommended that the management of deposit money banks should adopt rigorous credit standards that would aid banks in successfully assessing their clients' creditworthiness.

Kolapo and Fapetu (2015) considered the effect of interest rate risk on the performance of Nigerian banks from the period starting from 2002 to 2011. The findings of the study showed that interest rate risk had a weak effect on the performance of the banks; however, the study of Musiega et al. (2017) on the impact of interest rate risk on the financial performance of the banks showed that a positive relationship exists between interest rate risk and performance.

The above empirical reviews established that all the above findings confirmed that the statistical model used in explaining the effect of asset liability management on the financial performance of

commercial banks in Nigeria and other sub-Saharan countries failed to simultaneously consider all three prominent risks that form the foundation of the study of asset liability management of commercial banks in their statistical model and which often result in major threats to the financial performance of the banks. It is upon this background that the hypothesis of this study is established. Therefore, the hypothesis of the study is stated as follows:

H₀₁ Asset liability management has no impact on financial performance of commercial banks in Nigeria.

3. METHODOLOGY

The study adopted an ex post facto research design, since it is based on previously existing data relating to the variable of the study. According to (Central Bank of Nigeria Report, 2021) report the deposit money banks in Nigeria are currently twenty-three on the Nigeria Exchange Group (NGX), out of which 14 are publicly quoted companies while Nine are privately quoted companies. The sample size for this study was 11 publicly deposit money banks, purposively selected using the following three criteria: (i) the selected banks had a complete financial statement from 2012 to 2021 (ii) the selected banks must have presented the financial information in its annual report in the Nigerian currency (iii) the bank must be a publicly quoted company on the Nigeria Exchange Group (NGX). The study represented asset liability management with liquidity risk, credit risk and interest rate risk, while financial performance was represented with return on asset. While the statistical analysis was done using descriptive statistics which included: Mean, Median, Maximum, Minimum, Standard deviation, Skewness, Kurtosis, Jarque-Bera, and also inferential statistics such as; correlation, variance inflation factor, pool ordinary least square, Levin, Lin and Chu and Im, Pesaran and Shin W-stat Panel unit root test. The model for the study is stated as follows:

$$ROA_{it} = \beta_0 + \beta_1 LQR_{it} + \beta_2 INT + \beta_3 CRR + \beta_4 LEV_{it} + \beta_6 BkSZ_{it} + e_{it} \quad (1)$$

ROA means return on asset proxy for financial performance β_0 means Intercept or Slope.

LQR means Liquidity risk represented by customers deposit INT means Interest rate risk represented by interest rate CRR means Credit risk represented by loan to customers.

BkSz means Bank size (Control Variable) represented by natural logarithm of total asset.

LEV means leverage (Control Variable) represented by Total liability/Total asset.

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$ = Regression Coefficient.

i= Individual deposit money banks used in the study t= Time frame in the study.

4. REGRESSION RESULTS

4.1. Diagnostic Results

The section reports the descriptive statistics conducted on the variables used in achieving the second objective of this study, which is, to evaluate the effect of asset liability management on financial performance of deposit money bank in Nigeria were reported in this section. Table 1 contained the descriptive statistics of the variables such as the mean, median, standard deviation, minimum, maximum among others.

The statistics aided the study in assessing the quality of the data and the presence of outliers which might affect the robustness of the model, but since, the probability values for all the variables used in the study were < 5%, it can be inferred that existence of outliers variables in the dataset was less likely.

The average value for return on asset was 0.01609 and the standard deviation was 0.0199. This implied that the mean of return on asset of the banks had close variation to the standard deviation. The maximum return on asset was 0.061307 and the least was -0.110538, the median of 0.013594 indicates that more than 50% of the bank return of asset clustered around the mean, because the value of the mean and median were almost the same. The skewness showed that the return on asset was negatively skewed and the kurtosis of 18.0591 revealed that the distribution was leptokurtic. More so, the liquidity risk (LQR) of the banks reported an average of 27.85 and standard deviation of 1.9751. LQR of the banks report leptokurtic distribution of 6.496 and positive skewness of 0.7639. The maximum was 34.24 and minimum was 22.394. The log of the loan of the banks, showed that most of the banks were less exposed to liquidity risk because the mean and the standard deviation were close in values. This also implied that the banks had a holistically liquidity risk strategy which helped them to minimize their exposure to liquidity challenges. More so, there is no evidence of outlier in the variable. The financial leverage of the banks showed that in average the ratio of debt to asset was 0.8705 and the minimum ratio was 0.00063 and maximum was 3.

The skewness and kurtosis showed that leverage exhibited positive skewness and leptokurtic distribution. The Bank size report an average of 28.4780 and standard deviation of 1.6987. The maximum was 35.282 and minimum was 25.62. Interest rate in average was 8.233 and the maximum was 13.5961. The least interest rate was 0.4459. The standard deviation of the interest rate was 3.112. The credit risk and log of business growth report an average of 27.45021 and 24.87029 respectively. The least CRR was 22.37423 and maximum 33.78002. The least log of business growth was 19.03982 and maximum was 31.20932. The result of the normality test showed that all the variables were not normally distributed with $P < 0.05$.

4.2. Pairwise Correlation Analysis on the Effect of Asset Liability Management and Financial performance of Deposit Money Banks in Nigeria

Table 2 presented the pairwise correlation of the variables used in assessing the effect of asset liability management on financial performance of deposit money bank in Nigeria. The correlation

Table 1: Descriptive statistics of asset liability management and financial performance of deposit money banks in Nigeria

Parameters used for Descriptive statistics	ROA	LQR	LEV	BKSZ	INT	CRR
Mean	0.016091	27.85545	0.870544	28.47800	8.233726	27.45021
Median	0.013594	27.78851	0.867663	28.22310	6.455521	27.27761
Maximum	0.061307	34.24457	3.007423	35.28279	13.59615	33.78002
Minimum	-0.110538	22.39474	0.000633	25.62822	4.522189	22.37423
Standard deviation	0.019932	1.975101	0.342202	1.698760	3.133655	1.700678
Skewness	-2.558652	0.763985	2.788599	2.176183	0.445974	1.463115
Kurtosis	18.05913	6.496093	19.87667	8.863957	1.536657	8.710187
Jarque-Bera	1159.419	66.72121	1447.999	244.4250	13.46100	188.6915
Probability	0.000000	0.000000	0.000000	0.000000	0.001194	0.000000
Observations	110	110	110	110	110	110

Source: Researcher's computation, 2022

Table 2: Result of pairwise correlation the effect of asset liability management and financial performance in Nigeria

Probability	Correlation					
	ROA	LQR	LEV	BKSZ	INT	CRR
ROA	1.0000					
LQR (r)	-0.0230	1.0000				
(P-value)	(0.8110)	----				
LEV (r)	-0.0096	0.0281	1.0000			
(P-value)	(0.9206)	(0.7704)	----			
BKSZ (r)	0.0699	-0.0300	0.3859	1.0000		
(P-value)	(0.4679)	(0.7555)	(0.0000)	----		
INT (r)	0.1018	0.0680	-0.0626	0.0755	1.0000	
(P-value)	(0.2896)	(0.4799)	(0.5155)	(0.4329)	----	
CRR (r)	-0.0440	0.3594	0.0131	-0.1550	-0.1087	1.0000
(P-value)	(0.6475)	(0.0000)	(0.8913)	(0.1059)	(0.2579)	----

Source: Researcher's computation, 2024, Where ROA=Return on asset, CRR=Credit risk, INT=Interest rate risk, BKSZ=Bank size, LEV=Financial leverage, LQR=Liquidity risk, (r)=Correlation coefficient, (P-value)=Probability value

analysis was carried out among the independent variables in order to explore the degree of independence of the explanatory variables.

Firstly, the result showed that LQR is statistically correlated with CRR of the firm at ($r = 0.3594$, $P = 0.0000$) at 5% level of significance. The result of the correlation indicated that LQR and CRR were weakly positively correlated. Although, statistical correlation exists, the degree of the correlation was not strong enough to cause serious collinearity problem. More so, bank size had positive correlation with the financial leverage ratio with value of 0.3859 and $P = 0.000$. The correlation was weak and not strong enough to lead to multicollinearity. Other variables used in achieving the objectives were not statistically significant at 5% level of significance. The result of the pairwise correlation as displayed in the Table 2 revealed that the independent variables were not strongly correlated with each other and therefore the likelihood of collinearity is minimized.

The variance inflation factor was further conducted to assess the collinearity among the independent variables. The presence of collinearity can reduce the efficiency of the test statistics. Variance inflation factor of the variables should not be more than 10. If the VIF exceed 10, the variables concerned exhibit severe collinearity, which can affect the model test statistics. Therefore, since the variables in the study portrayed a variance inflation factor of < 2 , it can be inferred that the variables are not correlated. The result of the VIF in Table 3 indicates that the model is free from the

Table 3: Variance inflation factors

Proxy of Independent Variable and Control Variables used in the study	Coefficient	Centered
Variable	Variance	VIF
LQR	178.6926	2.850106
LEV	0.044773	1.213233
BKSZ	106.1379	1.252306
INT	27.41005	1.100495
CRR	242.9025	2.872447
C	221269.3	NA

Source: Researcher's computation, 2022. Where ROA=Return on asset, CRR=Credit risk, INT=Interest rate risk, BKSZ=Bank size, LEV=Financial leverage, LQR=Liquidity risk, (r)=Correlation coefficient, (P-value)=Probability value

multicollinearity problem because all the independent variables report VIF < 10 .

4.3. Panel Unit Root Test for the Variable

In the modern econometric parlance, time series as well as panel data variables may exhibit spurious regression, because sometimes statistical analysis could show that two variables are related to each other, but in reality there are no relationship with the variables, when considered from a theoretical perspective (Reheman, 2023). Although, in panel data, the existence of firm specific attributes, tends to eliminate any possibility of spurious regression in the variables. However, in order to ascertain whether

spurious regression exist in the dataset and in other to determine whether panel analysis can be conducted on the variables, the study conducted pre-estimation test using the Levin, Lin and Chu statistics and Im, Pesaran and Shin W-stat for the test of panel unit root and the result is presented in the Table 4. The Levin, Lin and Chu statistics as well as Im-Pesaran-Shin W-stat showed that there was no common unit root process among the variables considered by this hypothesis since, all the variables were significant and stationery at level.

Also, Im-Pesaran-Shin W-stat showed that there was no individual unit root process. Since, all the variables are stationery at level. This implies that over the period considered by the study the P-values were constant, thus, predicting the behaviour of the variables in the present and in the future might be relatively easy. The result of the test indicates that all the variables was stationary at level, in other words, the variables must be stationary at level before the proposed panel analysis can be conducted.

4.4. Regression Result

Table 5 reported the result of the model estimation of the effect of asset liability management on financial performance of deposit money banks in Nigeria. The study reported the result of Pooled OLS, fixed and random effect in Table 5. The result of the Breusch-Pagan test 64.46217 was (0.0000) which shows

that pooled OLS was not preferable than the random effect. The Hausman specification test showed that fixed effect model was better than random effect. The Redundant Fixed Effects Tests 9.13980 (0.0000) showed that there was significant fixed effect.

More so, the overall significance of the model was assessed using the f-value. The result of the joint significance of the variables ($f = 9.720, P = 0.0000$) showed that the model is statistically significant with $P < 0.05$, this implied that the effect of asset liability management on financial performance of deposit money bank in Nigeria was statistically significant and the null hypothesis that stated that there was no significant relationship between asset liability management and financial performance was rejected while the alternative was accepted. This was also supported by the result of the fixed effect model, since, about 64.23% sources of variation was accounted for by the independent variables. The variable liquidity risk (LQR) exhibited a positive impact on financial performance of the deposit it money banks since it had a $P = 0.0054$. This implies that efficient liquidity risk management will help the bank sustain its growth and it numerous stakehoders. This agrees with the summation of Alqemzi et al. (2022) emphasised that liquidity risk management helps the bank to improve its financial performance since it strengthens the relationship of the bank with its numerous customers. Although, it had a negative regression coefficient (-0.2316), which meant that a rise in the liquidity risk problem by one unit will lead to decrease in the

Table 4: Panel unit root test for the effect of asset liability management and financial performance in Nigeria

Variables extracted from the panel Unit root test	Levin, Lin and Chu t*		Im, Pesaran and Shin W-stat		Remarks
	Test statistics	P-value	Test statistics	P-value	
CRR	-12.1647	0.0000	-3.74394	0.0000	Stationary level
BKSZ	-10.7030	0.0000	-4.3256	0.0000	Stationary level
LEV	-12.0311	0.0000	7.08978	0.0000	Stationary level
LQR	12.16386	0.0000	-3.74413	0.0000	Stationary level
ROA	-24.0956	0.0000	-13.7186	0.0000	Stationary level

Table 5: Regression result

Variables used for pool	Pooled OLS			Fixed effect			Random effect model		
	Coefficient	t-value	P-value	Coefficient	t-value	P-value	Coefficient	t-value	P-value
Regression Analysis									
LQR	-0.5568	-4.0387	0.0001	-0.2316	-2.8452	0.0054*	-0.3004	-2.4830	0.0147
LEV	-0.1489	-0.2741	0.7845	1.2959	2.6633	0.0091	1.0193	2.1596	0.0331
BKSZ	-0.2399	-2.3547	0.0204	-0.1102	-0.5927	0.5548	-0.1996	-1.3797	0.1707
INT	0.1203	2.1440	0.0344	0.1043	2.4108	0.0179*	0.1104	2.5824	0.0112
CRR	0.8562	5.2521	0.0000	0.5447	3.4066	0.0010*	0.6222	4.1288	0.0001
C	-3.1388	-0.6518	0.5160	-6.7859	-1.1186	0.2662	-4.4314	-0.8406	0.4025
R-squared		0.2870			0.6423			0.2114	
Adjusted R-squared		0.2381			0.5762			0.1573	
F-statistic		5.8678			9.7206			3.9078	
Prob (F-statistic)		0.0000			0.0000			0.0008	
Panel cross-section					96.4220 (0.8187)				
Heteroskedasticity LR test									
Arellano-bond serial correlation test					-0.2406 (0.8098)				
Redundant fixed effects tests					9.13980 (0.0000)				
Hausman test					29.6273 (0.0001)				
Lagrange multiplier tests for random effects					64.46217 (0.0000)				

Source: Researcher’s computation, 2022

dependent variable return on asset (proxy of financial performance) but, holding other variables in the model constant. This also confirms that an increase in liquidity risk challenges among the banks will lead to decrease in the financial performance of the banks. Most of these liquidity risk challenges that causes financial performance of deposit money bank to decline usually arises when the bank grant loan to high risk borrower with poor credit history and also when the banks use short term asset to finance long term liability (i.e. mismatch of asset and liability) (Cabello, 2013).

Also, the result revealed that interest rate had positive impact on the financial performance of the banks (Coeff = 0.1043, $t = 2.4108$, $P = 0.0179$). This showed that rise in interest rate income brought about increase in financial performance of the banks. This also meant, that as the net interest income of deposit money banks continues to increase as a result of increase in the interest rate; their financial performance will also continue to increase, however, this is subject to the customers paying their principal and interest on loan as at when due. This is in tandem, with the study of (Kolapo and Fapetu, 2015), who stated that the movement of interest rate had statistical significant impact with banks financial performance as well as their assets and liabilities. In addition, the result of the positive regression coefficient meant that increase in the net interest rate income by one unit as a result of favorable interest rate movement lead to increase in financial performance of the deposit money bank although other variables in the model still had to be held constant.

Similarly, credit risk of the banks had positive relationship with the financial performance of the banks (Coeff = 0.5447, $t = 3.4066$, $P = 0.0010$). This implies that Credit risk has statistical significant impact on the financial performance of the banks, since the result of the regression showed a $P < 5\%$. While the positive regression coefficient indicated that improvement in the credit risk by one unit as a result good credit risk management strategies lead to positive improvement on the financial performance. In other words, the adequate management of the loan and advance which represented credit risk often lead to increase in financial performance of deposit money banks, because most deposit money banks generate their major income from granting loans to customers, however, some customers may default in paying their loan, which may affect the interest income. This is also the reason why most banks make provision for doubtful loan (Akinola and Ogbeifun, 2020).

Thus, it can be inferred that asset liability management has positive impact on financial performance of deposit money banks and this was corroborated by the study of Njogo et al. (2014), who submitted that asset liability management had positive impact on the profitability of Nigeria banks, but was contrary to the study of Onaolapo and Adegoke (2020) and Ajibola (2016) who emphasized that asset and liability had both positive and negative effect on financial performance of deposit money banks in Nigeria.

More so, financial leverage ratio enhance financial performance of the bank, that is, in average, financial Leverage ratio exhibited statistical significant relationship with the financial performance with coefficient of 1.2959 and $t = 2.6633$. This could be because

most deposit money banks depended on debt to expand their operation, consequently, increasing their financial performance (Nires and Velnampy, 2012).

The study also conducted post estimation tests in order to ascertain the degree of consistency and efficiency of the model. The result of the serial correlation as captured by the Arellano-Bond Serial Correlation Test 0.2406 (0.8098) showed that the residual of the model was consistency because it accepted the null hypothesis of no autocorrelation and therefore, does not violate the assumption of no autocorrelation. Also, the model residual showed that the model exhibited homoscedasticity with Panel Cross-section Heteroskedasticity LR Test 96.4220 (0.8187). This showed that the residual does not violate the assumption of homoskedasticity, no serial correlation and no multicollinearity.

5. DISCUSSION

The findings of the study established that asset liability management had statistical significant effect on financial performance of deposit money bank and this was because the pool regression result showed that interest rate risk represented by interest rate had statistical significant effect on financial performance of deposit money bank since, the P-value ($P = 0.0179$) obtained was $< 5\%$ level of significance and this meant that flexible interest rate will give rise to improvement in the financial performance of the deposit money bank, since, this creates opportunity for the bank to generate more income. This was supported by the study of Obinna (2020) who emphasised that flexible interest rate and deregulation of interest rate will lead to improvement in financial performance of banks and of the real sector of the economy. The findings also established that credit risk has statistical significant impact on financial performance because the pool regression result revealed a ($P = 0.0010$) which was less than the benchmark of 5% level of significance used for this analysis. This also meant that adequate management of credit exposure of the bank may translate to improvement in the financial performance of the deposit money bank. This narration was supported by the findings of Nwude and Okeke (2018) who maintained that credit risk measured with total loans and advances of Nigerian banks had positive effect on financial performance proxied by return on equity and return on asset.

In addition, the findings under this objective revealed that one of the control variable financial leverage had statistical significant impact on the result of pool regression of asset liability management and financial performance, since the regression statistics showed that it had a ($P = 0.0091$) which was $< 5\%$ level of significance. This also meant that majority of the banks depended on significant proportion of debt and equity to ensure they maintained a steady progress. This was supported by the study of (Nires and Velnampy, 2012) who affirmed that bank managers are able to run the banks operation smoothly by depending on equity and debt.

6. CONCLUSION

The study concluded that management of commercial banks should always ensure that these three prominent ALM risk components

are part of their asset liability management policies, since, they have direct effect on the financial performance of the bank. It is also important for the banks management to incorporate these three components into their asset liability management because the statistical analysis of this study revealed that all the prominent asset liability management risk components variables had statistical significant effect on financial performance of the Nigerian commercial banks.

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