Saudi Journal of Economics and Finance (SJEF)
Abbreviated Title: Saudi J. Econ. Fin.
A Publication by "Scholars Middle East Publishers", Dubai, United Arab Emirates

ISSN 2523-9414 (Print)
ISSN 2523-6563 (Online)

Banking Sector Performance and Non-Performing Loans in Nigeria (1990-2016)

Patrick, OLOGBENLA*
Federal Inland Revenue Service Abuja, Nigeria

***Corresponding author**
Patrick, OLOGBENLA

Article History
Received: 20.01.2018
Accepted: 06.02.2018
Published: 28.02.2018

Abstract: The study examined impact of non-performing loans on bank performance in Nigeria between 1990 and 2016. Both return on asset ROA and profit after tax are two financial performance indicators used as dependent variables. Other independent variables used are non-performing loans, loan and advances, total deposits and lending rates. Auto-regressive distributed lags ARDL and Vector auto-regression VAR are applied. The results show that all the variables show significant long and short run relationships with ROA but not with PAT. The relationship between PAT and NPL with other variables are analysed via VAR since cointrgration could not be established. The VAR result indicates that PAT as measure of bank performance is more responsive to changes in total deposits more than any other variable including the NPL. It is concluded that ROA appears to be a better measure of bank performance when studying effects of NPL as it shows that it has significant negative impact on ROA but the PAT does not show any significant response to NPL.

Keywords: Nonperforming loans, Banking sector performance, Return on asset.

INTRODUCTION

Over the year the relationship between non-performing loan and bank performance has been a subject of discussion among various authors.

This has led to the development of a dichotomy regarding the conclusion of various authors on this subject matter. Explicitly, there is emergence of two distinctive views on the relationship between non-performing loan and bank performance.

Firstly, some group of authors believed and concluded from their studies, that credit risk (nonperforming loans) aids bank performance through interest yield on loans and according to them the yield on these loans often significantly out weights the principal there by increasing the profit of the banks and consequently increasing bank performance. Hosna *et al*., [1], for example; assessed the effect credit risk management and profitability in commercial banks in Sweden. Using two credit risk indicators (NPLR and ROE), the findings and analysis revealed that credit risk management has effect on profitability in all 4 banks selected.

Dasah *et al*., [2] found a positive relationship between nonperforming loans and profitability in Ghanaian commercial banks. The result is consistent with that of Afriyie and Okotey [3], who found a significant positive relationship between non-performing loans with profitability of rural and community banks in Ghana. The study by Achou and Tegnuh [4]; indicated that effective credit risk management leads to better bank performance. The result of the study by Achou and tegnuh [4] is supported by the study by Hosna *et al*., [1] in Sweden and Flamini *et al*., [5] in Sub-Saharan Africa commercial banks.

Secondly, the other group of authors concluded from their findings that nonperforming loan is inimical to the growth of banking industries, in that it inhibits bank performing by accumulation of bad debt which limit bank efficiency [6-8].

Based on these difference views explained, it is apparent that a consensus has not been reached on what exactly the relationship between non-performing loan and bank performance. Again, Hou & Dickinson **[6]** stated that this relationship might vary from countries to countries due to difference in political and institutional set up of these countries. However, most of all the empirical works around nonperforming loans and bank performance have used some selected banks as their case study. This might not have revealed the entire situation for the whole banking industry in

Nigeria. Consequently, to examine the exact relationship between nonperforming loans and bank performance in Nigeria this study takes an holistic view of the entire banking sector, this will give a true picture of the relationship in Nigeria as it is done by Kaaya & Pastory [8] and Takeda & Shawn [9] for Pakistan and Turkey respectively.

LITERATURE REVIEW

Hosna, Manzura & Juanjuan [10] studied ―Credit Risk Management and Profitability of Commercial Banks in Sweden. They took 4 banks to study this area and used multiple regression models to analyze their findings. The researchers obtained that ―there is a reasonable effect of credit Risk Management on profitability of those banks.

Ahmad and Ariff [11] examined the key determinants of credit risk of commercial banks on emerging economy banking systems compared with the developed economies. The study found that regulation is important for banking systems that offer multi-products and services; management quality is critical in the cases of loan-dominant banks in emerging economies. An increase in loan loss provision is also considered to be a significant determinant of potential credit risk. The study further highlighted that credit risk in emerging economy banks is higher than that in developed economies.

Hou and Dickinson [6], which examined the non-performing loans on microeconomics, specifically at the bank level to empirically evaluate how non-performing loans (NPLs) affect commercial banks' lending behavior. In particular, it is discussing some consequences of nonperforming loans (NPLs) on the economics. They have used empirical methodology for testing the effect of non-performing loans (NPLs) which the data taken from individual bank's balance sheet to assess whether non-performing loans (NPLs) will negatively affect bank's lending behavior.

Heffernan [12] stressed that credit risk is the risk that an asset or loan becomes irrecoverable, in the case of outright default or the risk of delay in servicing of loans and advances. Thus, when this occurs or becomes persistent, the performance, profitability, or net interest income of banks is affected.

Felix and Claudine [7] investigated the relationship between bank performance and credit risk management. It could be inferred from their findings that return on equity (ROE return on assets (ROA) both measuring profitability were inversely related to the ratio of non-performing loan to total loan of financial institutions thereby leading to a decline in profitability.

Kargi [13] evaluated the impact of credit risk on the profitability of Nigerian banks. Financial ratios as measures of bank performance and credit risk were collected from the annual reports and accounts of sampled banks from 1980-2010 and analyzed using descriptive, correlation and regression techniques. The findings revealed that credit risk management has a significant impact on the profitability of Nigerian banks. It concluded that banks' profitability is inversely influenced by the levels of loans and advances, non-performing loans and deposits thereby exposing them to great risk of illiquidity and distress. Epure and Lafuente [14] examined bank performance in the presence of risk for Costa-Rican banking industry during 1980-2002. The results showed that performance improvements follow regulatory changes and that risk explains differences in banks and non-performing loans negatively affect efficiency and return on assets while the capital adequacy ratio has a positive impact on the net interest margin.

Mohammed [15] studied the bank performance in context of corporate governance for which mainly the ratios of non-performing loans and loan deposits have been used. Study was conducted on 9 banks of Nigeria for a period of 10 years from 1981-2010. According to generalized least square regression results, non-performing loans ratio has significant negative effect while loan deposit ratio has insignificant negative effect on performance. So, survival of banks is strongly dependent upon the better asset quality means dependent upon minimizing the non-performing loans ratio.

Kolapo, Ayeni and Oke [9] carried out an empirical investigation into the quantitative effect of credit risk on the performance of commercial banks in Nigeria over the period of eleven (20) years (1980-2011). Using panel model analysis to estimate the determinants of the profit function, the result showed that the effect of credit risk on bank performance is cross-sectional invariant. That is the effect is similar across banks in Nigeria suggesting that banks in Nigeria should enhance their capacity in credit analysis and loan administration.

Onyiriuba [16], provided some empirical evidence on how poor stock returns emanating from underperforming Nigerian bank credit portfolio fuelled negative volatilities in foreign exchange, substantial reduction in the aggregate value of capital market and contagious in other sectors of the Nigerian economy

METHODOLOGY

Model specification

The model adopted for this study takes its root from the bank risk management theory as propounded by David [17]. This theory was adopted by Kargi [13] which measured profitability with Return on Asset (ROA) as a function of the ratio of Non-performing loan , Total loan & Advances, Total deposit used as indicators of credit risk. However, the study improved on the model by incorporating the lending rate and total liquidity ratio which has been identified as important determinants of NPL as part of the independent variables. Again, the model is modified to include another bank performance indicator that is profit after tax. Therefore, two models are to be estimated, this will pave way for a comparative analysis of the effect of NPL on the two performance indicators.

The model for this study functionally becomes;
ROA= f (NPL, LA, LEDR, TD)…………………………………………......(1)
PAT= f (NPL, LA, LEDR, TD)……………………………………............(2)

The model to be estimated is stated in linear form thus;
Where;

ROA: Return on Assets
NPL: Non-Performing Loan
LA: Loan and Advances
TL: Total Liquidity
LEDR: Lending rate
TD: Total Deposit
PAT: Profit after tax

The econometric equation for the model is specified as

Where;

β0 = Constant parameter/Intercept
β1-β3 = Coefficients of independent variables
μ = Error term

The 'a priori expectation' in the model is that all the independent variables are expected to have a negative relationship on bank performance measured by Return on Assets (ROA) except loans and advances which is expected to have a positive relationship with bank performance. The mathematical expression is represented as; β1, β2,< 0 and β3>0 implying that a unit increase in the independent variables will lead to decrease in ROA by a unit

Estimating technique

The estimation procedures employed in this empirical investigation is based on ARDL bound test. The reason for the adopting ARDL bound test is explained later. However, the techniques start with the investigation of the time series properties of the variables using unit root test.

Unit Root Test

Testing for the existence of unit roots is a key pre-occupation in the study of time series models and co-integration. What are unit roots? Let us begin with a definition. A stochastic process with a unit root is itself non-stationary. Another way of looking at it is that testing for the presence of unit roots is equivalent to testing whether a stochastic process is a stationary or non-stationary process. In sum, the presence of a unit root implies that the time series under scrutiny is non-stationary while the absence of a unit root means that the stochastic process is stationary, Maddala [18] has offered an interesting perspective and interpretation on the testing for unit roots.

According to Maddala [18], testing for unit roots is a formalization of the Box-Jenkins method of differencing the time series after a visual inspection of the correlogram. No wonder then that testing for units roots plays a central role in the theory and technique of co-integration.

Currently, there are some commonly accepted methods of testing for unit roots. These are the Dickey-Fuller (DF), Augmented Dickey-Fuller (ADF) test and the Philip Peron (PP) test. The Augmented Dickey-Fuller (ADF) test is considered superior to the Dickey-Fuller (DF) test because it adjusts appropriately for the occurrence of serial correlation.

$$X_t = b_0 + b_1 X_{t-1} + b_2 X_{t-2} + b_n X_{t-n} + U \qquad \ldots\ldots\ldots\ldots(3)$$

Where U is a stationary error term. The null hypothesis that X_t is non stationary is rejected if b_1 is significantly negative.

The number of lag (n) of X_t is usually chosen to ensure that the regression is approximately white noise. It is simply referred to as the DF test if no such lags are required in which case $b_i = 0$ (i = 1……..n). However, the t-ratio from the regression does not have a limiting normal distribution.

An important assumption of the DF test is that the error term is independently and identically distributed. The ADF test adjust the DF test to take care of possible serial correlation in the error term by adding the lag difference terms of the regress and. Phillip and Perron use non-parametric methods to take care of the serial correlation in the error term without adding lagged difference terms. Since the asymptotic distribution of PP test is the same as the ADF test statistic, the PP test is preferred for this study. Co-integration is based on the properties of the residuals from regression analysis when the series are individually non stationary. A series is stationary if it has a constant mean and constant finite variance.

Thus, a time series X_t is stationary if its mean E(Xt) is independent of time and its variance $E\{X_t - E(X_t)^2\}$ is bounded by some finite number and does not vary systematically with time. It tends to return to its mean with the fluctuations around this mean having constant amplitude.

Estimating technique: ARDL MODEL

The choice of this estimation procedure is primarily informed by the fact that it passes the fitness-for-the-purpose-test. For instance, one option available to perform the co-integration test is the Engle-Granger approach [19], but its weakness lies in the fact that it is only able to use two variables. A multivariate analysis, such as that considered in this study, leads to the use of the Johansen and Joselius co-integration analysis or ARDL model. The statistical equivalence of the economic theoretical notion of a stable long-run equilibrium is provided by these two models, but the choice will depend on the characteristics of the data.

This study is unable to use the Johansen procedure (an option) as all the variables are not completely I (1), that is, integration of order one. This assumption is a pre-condition for the validity of the Johansen procedure. Alternatively, the ARDL model is appropriate to run the short-run and long-run relationships [20].

The guide that will be followed in this study is that if all variables are stationary, I (0), an ordinary least square (OLS) model is appropriate and for all variables integrated of same order, say I (1), Johansen's method is very suitable when we have fractionally integrated variables, variables at different levels of integration (but not at I(2) level) or cointegration amongst I(1) variables.

The ARDL model will then be performed with the formulation of a conditional error correction model [22] as below:

$$\Delta roa = \beta_0 + \sum_{i=1}^{p} \beta_i \Delta npl_{t-i} + \sum_{j=0}^{q_1} \propto_j \Delta tl_{t-j} + \sum_{k=0}^{q_2} \emptyset_k ta + \sum_{l=0}^{q_3} \varepsilon_l \Delta td + \sum_{m=0}^{q_4} \epsilon_m \Delta ledr_{t-m} + \sum_{v=0}^{q_5} e_v \Delta exr_{t-v} + \theta_0 npl_{t-1} + \theta_1 tl_{t-1} + \theta_2 ta_{t-1} + \theta_3 td_{t-1} + \theta_4 ledr_{t-1} + \theta_5 exr_{t-1} + e_t$$

where p,q_1,….., q_5 represents appropriate maximum lags. The same model can be adopted for PAT also.

Sources of Data

In the process of collecting data for this study, all the variables used are sourced from the MUNDI index and World Bank (2016) edition.

RESULTS AND DISCUSSION

The analysis starts with the unit root test which is a pre-condition for cointegration test. Apart from showing if cointegration test can be conducted, it will also show the method of cointegration analysis to be adopted. The method adopted for the stationarity test is the ADF method. Some of the variables such as loan and advance, non-performing loan, total deposit and lending rates are logged while return on asset and profit after tax are not logged because they are already in percentages to avoid missing values. The result is presented in table 1.

Table-1: Unit root test

Variables	ADF Statistics	Order of integration
Log of Loan and advance [LLA]	-8.863548	I(1)
Log of nonperforming loan [LNPL]	-5.094282	I(1)
Log of total deposit [LTD]	-2.745959	I(0)
Log of lending rate [LLEDR]	-3.807445	I(1)
Return on asset[ROA]	-5.331091	I(1)
Profit after tax [PAT]	-7.746037	I(1)

(*) Statistical significance at 10%,(**) Statistical significance at 5%,(***) Statistical significance at 1%
Source: Authors computation

The results of the unit root test show that all the variables are integration of order one that is I (1) except total deposit which is stationary at levels that is I (0). The implication is that five out of the six variables in the model are non-stationary and thus a linear combination of them can be stationary. This is the essence of cointegration. However, the choice of the cointegration techniques depends on the order of integration of the variables. Since not all the variables are I (1) then, Johansen cointegartion technique cannot be applied hence Autoregressive distributed lags ARDL bound test is used. Two models are used. The first model used profit after tax as the dependent variable and the second model made use of return on asset. The results of the ARDL regression for the two models are first presented in equations 4.1 and 4.2

ARDL regression equations for ROA and PAT

$ROA = 3.331288 + 0.888209ROA_{t-1} - 0.074459ROA_{t-2} + 0.819298\text{LNPL} - 0.388130NPL_{t-1} + 1.657042\text{LTD} + 0.131651\text{LLA} - 0.712201LLA_{t-1} - 1.423341\text{LLEDR} + 1.300663LLERD_{t-1}$ ……[5]

$R^2 = 0.99$, F stat = 342.9. rob (F-statistic)=0,0000 , Durbin Watson DW=1.71

$PAT = -14.71412 + 0.887839PAT_{t-1} + 0.032432\text{LNPL} - 0.388130NPL_{t-1} - 8.861650\text{LTD} + 0.562324LTD_{t-1} + 00.88671\text{LLA} + 1.195555\text{LLEDR}$…… [6]

$R^2 = 0.81$, F stat = 32.56. rob(F-statistic)=0,0000 , Durbin Watson DW=2.003

Equations 5 and 6 explain the relationship between ROA and the independent variables and PAT and other independent variables respectively. However, the essence of the estimated equations is to be able to investigate te existence of cointegration by conducting the cointegration test

The test of cointegration using the ARDL bound test is the next. This will provide an insight into the existence of cointegration or otherwise before the estimation of the long run and short run equations for both models.

Table-2: Cointegration bound test for ROA

Null Hypothesis: No long-run relationships exist				
Test Statistic	Value	K		
F-statistic	6.743636	4		
Critical Value Bounds				
Significance	I0 Bound	I1 Bound		
10%	2.2	3.09		
5%	2.56	3.49		
2.5%	2.88	3.87		
1%	3.29	4.37		

Table-3: Cointegration bound test for PAT

Null Hypothesis: No long-run relationships exist				
Test Statistic	Value	K		
F-statistic	1.213357	4		
Critical Value Bounds				
Significance	I0 Bound	I1 Bound		
10%	2.2	3.09		
5%	2.56	3.49		
2.5%	2.88	3.87		
1%	3.29	4.37		

Comparing Table-2 & 3 shows that only the ROA estimated model passed the bound test. This is because the F statistics value is greater than all the critical values at both the lower and upper bounds. But the case is different for the PAT model where the F statistics is less than all the critical values at both the lower and upper bounds. Consequently, it is obvious that only ROA as a measure of bank performance exhibit long run relationship with non-performing loans and other independent variables.

The next step is to estimate both long run and short run relationship for the two models. However, only the cointeration equation of ROA will be interpreted because it as a valid cointegration relationship with non-performing loans and other variables used as independent variables. The estimation of PAT relationship with the independent variables will be explored through the unrestricted VAR since it does not exhibit a valid long run relationship with non-performing loans and other variables.

Equations 7 to 8 explain the long and short run relationships between each of the dependent variables that is ROA and PAT and non-performing loans.

Long run and short run equations for ROA

Short run equation

$ROA = -0.39\text{cointEq}(-1) + 0.2\text{D}ROA_{t-1} - 0.2ROA_{t-2} - 0.7\text{DLNPL} + 1.1\text{DLTD} + 0.31.1\text{DLLA} - 1.4\text{DLEDR}$……[7]

$\mathbf{S.E}\ (\mathbf{0.05})^{***}\quad (\mathbf{0.101})^{***}\quad (\mathbf{0.108})\quad (\mathbf{0.22})^{***}\quad (\mathbf{0.57})^{**}$
$(\mathbf{0.29})\qquad (\mathbf{0.08})^{***}$

Long run equation

$$\boldsymbol{ROA = 8.5 - 1.1LNPL + 4.2LTD - 3.9LLA - 1.4LEDR}\text{……[8]}$$

$\mathbf{S.E}\ (\mathbf{10.0})\quad (\mathbf{0.33})^{***}\quad (\mathbf{1.37})^{**}\quad (\mathbf{0.87})^{***}\quad (\mathbf{0.77})^{***}$

Equations 8 and 7 explain the short run relationship between ROA and NPL with other independent variables. Firstly the error correction term in the estimated model is -0.39 implying that the error term is correctly signed is statistically significant, therefore the error correction term can perform the adjustant role very well.

Secondly, non-performing loan shows a positive and significant relationship with bank performance as proxied by ROA. This implies that non-performing loan will have a significant short run impact on bank performance. Other variables such as total deposit and lending rate all shows significant short run impact on bank performance.

Equation 8 explains the long run relationship between ROA and non-performing loans and other independent variables. The results show that ROA exhibit significant long run relationship with non-performing loan and all other variables in the estimated model. The coefficient of non-performing loan is 1.1. This indicate that a unit rise in nonperforming loan will lead to about 1.1 unit rise in the ROA. Total deposits also have significant positive impact on ROA both lending rate and loan and advance show significant inverse relationship with ROA

Diagnostic tests

As robust tests to our estimations, some diagnostics tests are conducted. The tests are heteroskedaticity and serial correlation tests.

Test for heteroskedaticity

Table-5: ARDL HETEROSKEDASTICITY TEST

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.386405	Prob. F(17,42)	0.1918
Obs*R-squared	21.56713	Prob. Chi-Square(17)	0.2019
Scaled explained SS	12.14301	Prob. Chi-Square(17)	0.7914

The results of the hereoskedaticity test are presented in table 5. The null hypothesis is that there is no heteroskedaticity. Using the F statistics, it is discovered that the probability of F shows that the null hypothesis is to be

accepted. Therefore, we conclude that our model is not having the problem of heteroskedaticity which may affect the validity of our results.

Test for serial correlation

Table-6: ARDL SERIAL CORRELATION LM TEST

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.935484	Prob. F(2,40)	0.4008
Obs*R-squared	2.681049	Prob. Chi-Square(2)	0.2617

The null hypothesis here is that there is no serial correlation. Considering the F statistics and the probability, it is obvious that the null hypothesis is to be accepted while we reject the alternative hypothesis that there is serial correlation. Consequently, the estimates from our model are valid and can be used for forecasting.

Analysis of the impact of non-performing loan on banks profit after tax PAT as measure of bank performance

As earlier stated the relationship fails to exhibit a long run relationship. The implication is that there appear to exist only a significant transitory relationship between PAT and NPL and other independent variables. The result shows that some variables are significant in the short run estimated model for PAT. However, none of the variables have individual significant impact on PAT in the long run equation. Thus, affirming the nonexistence of long run relationship. The implication of this is that we can proceed to analyze the relationship via vector auto-regression VAR. the unrestricted VAR result is presented as follows;

V**AR estimation of the relationship between PAT and NPL with the other independent variables**

This is analysis is done via the two tools of analysis offered by VAR. these are impulse response function IRF and variance decomposition analysis. We begin with the impulse response analysis.

I**mpulse response function for PAT**

This explains the responses of PAT to 1% standard deviation in NPL and other variables. In other words, the short run responses of PAT to shocks from NPL and other variables are described in figure-1

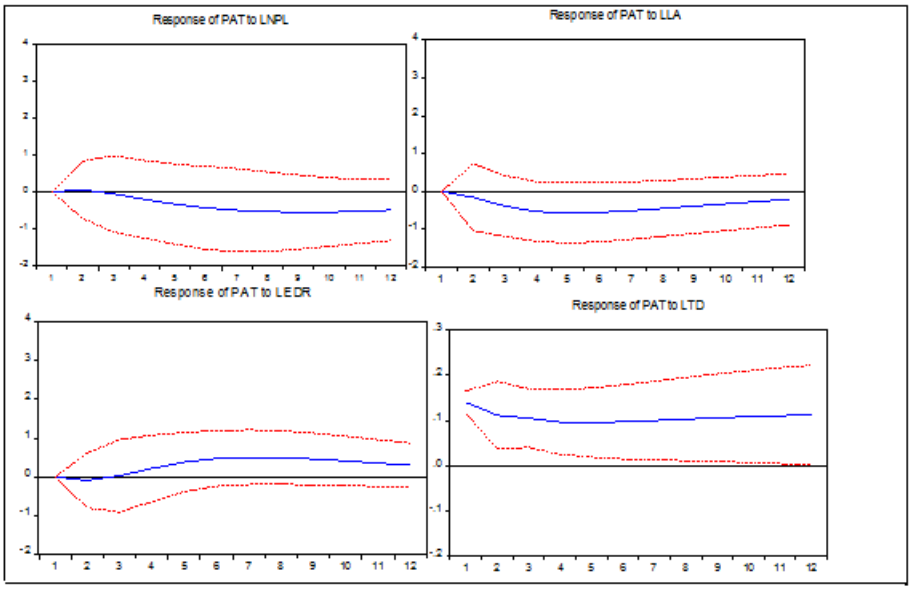

Fig-1: impulse response function for PAT

Figure-1 describes the responses of PAT to NPL shock and other shocks coming from other independent variables in the model. The response of PAT to NPL appears not to be significant. The implication is that the level of NPL currently in the banking sector has not significantly influenced the PAT of the banks in Nigeria. The same response is replicated by PAT in it response to LEDR and LLA shocks. The only variable that produces significant response from the PAT is the TD that is total deposit. The implication is that the PAT of the banks is highly responsive to bank deposits than NPL. Next is the variance decomposition analysis of PAT.

Variance decomposition of PAT

This is a table describing the contributions of each of the shocks to the behavior of PAT. The relative impacts of NPL shock and other variables' shocks to the behavior of the PAT are shown in the table.

Table-7; Variance decomposition of PAT

PERIOD	S.E.	PAT	LNPL	LTD	LLA	LEDR
3	4.421282	98.43430	0.030175	0.596880	0.893286	0.045364
6	4.792018	89.57405	1.502189	2.298587	4.752742	1.872432
9	5.051362	81.14910	3.038474	4.630954	6.682709	4.498764
12	5.204129	76.51457	3.327037	7.374144	7.118854	5.665396

The tables show that apart from the own shock banks total deposit contributes the largest shock to the behavior of the PAT when compared to other variables. This follows the results shown on the IRF. Loan and advances shock follows the bank deposits shock, then the lending rate shock and NPL shock. The implication of this result is that the behavior of the PAT is more dictated by the bank total deposits.

CONCLUSIONS AND RECOMMENDATIONS

Findings from the study have shown that NPL and other variables only exhibit long run relationship with ROA as a measure of bank performance. PAT only shows significant short run relationship with NPL and other variables. The implication of this result is that NPL has more effect on the earnings ratios than profit after tax. This result is evident in the annual report of some banks where bogus figures are published as their profit after tax and yet there is increase in their non-performing loans. Therefore, PAT at times might not show the true reflection of the banks performances as the earnings ratios such as ROA. Adeleke [21] once posited that many of the figures for PAT in annual reports of some banks are tainted to give the shareholders good impression about the bank therefore it might not reflect the true performance of the banks

Again, the impact of non-performing loans on ROA is negative and significant. This implies that increase in NPL will also lead decrease in ROA. This indicates that the upsurge in NPL also brings about a significant fall in the ROA both in the long and short run periods. Other variables that have significant impact on ROA as a measure of bank performance in Nigeria are total deposits, loan and advance and lending rates all of them are very germane to the performance of the banks especially in the long run.

However, profit after tax has been shown to be mostly influenced by total deposits of the banks and not NPL. Findings from the research work indicate that PAT of banks is more responsive to changes in total deposits. This is followed by loan and advance and lending rate in that order.

Finally, it can be concluded from the study that NPL affects the ROA more than the PAT and ROA has been shown to be a better measure of bank performance than the PAT since it shows significant relationship with all the variables used in the model unlike PAT which is more responsive to total deposits alone in the short run, none of the variables shows a significant relationship with PAT in the long run. It is recommended that banks should consider the implication of NPL on their earnings ratios as against PAT which might be misleading. And they should guide against accumulation of NPL as it affects their performance negatively.

REFERENCES

1. Hosna G., and D. Klingebiel (2000) Bank Insolvencies: Cross Country Experience, ‖ World Bank Policy and Research Working Paper 1574 (Washington).
2. Dasah, F., & Ahmed, J. (2002) Origin of Mexico's 1994 Financial Crisis, The." *Cato J.* 17: 303.
3. Afiriyie, P., & Okotey, L. (2000). "Macroeconomic and bank-specific determinants of non-performing loans in Greece: A comparative study of mortgage, business and consumer loan portfolios." *Journal of Banking & Finance* 36.4: 1012-1027.
4. Achou, N. & Tegnuh, Y. (2003). "The modeling of financial instability: An introduction." *Modelling and Simulation* 5, no. 1: 267-272.
5. Mody, A., & Taylor, M. P. (2004). Financial predictors of real activity and the financial accelerator. *Economics Letters*, *82*(2), 167-172.
6. Hou, R., & Dickinson, Y. (2013). Nonperforming loans and macro financial vulnerabilities in advanced economies. *IMF Working Papers*, 1-27.
7. Felix, N., & Claudine, G. (2005). Banking supervision and nonperforming loans: a cross-country analysis. *Journal of financial economic policy*, *1*(4), 286-318.
8. Kaaya, A., & Pastory, T. (1993). The Processes Involved in Business Cycles. In *Business cycles: the problem and its setting* (pp. 1-60).

9. Kolapo, T. F., Ayeni, R. K., & Oke, M. O. (2012). Credit Risk and Commercial Banks'performance In Nigeria: A Panel Model Approach. *Australian journal of business and management research*, *2*(2), 31.
10. Hosna, A., Manzura, B., & Juanjuan, S. (2009). Credit risk management and profitability in commercial banks in Sweden. *rapport nr: Master Degree Project 2009: 36*.
11. Ahmad, N. H., & Ariff, M. (1997). Determinants of credit risk of commercial banks on emerging economy banking systems compared with the developed economies. *Contemporary economic policy*, *24*(3), 418-431.
12. Heffernan, F. (1996). Public recapitalizations and bank risk: evidence from loan spreads and leverage. *Journal of Economic Theory*, *38*(2), 211-232.
13. Kargi, S. A. (2011). Determinants of Foreign Direct Investment in Fast-Growing Economies: A Study of BRICS and MINT. *African Governance and Development Institute WP/14/002*.
14. Epure, M., & Lafuente, E. (2015). Monitoring bank performance in the presence of risk. *Journal of Productivity Analysis*, *44*(3), 265-281.
15. Mohammed, F. (2012). Financial liberalization and financial fragility.*Applied Econometric Time Series*', John Wiley and Sons, Second Edition.
16. Onaolapo, A. R. (2012). Analysis of credit risk management efficiency in Nigeria commercial banking sector,(2004-2009). *Far East Journal of Marketing and Management*, *2*(4), 39-52.
17. Brealey, R., Leland, H. E., & Pyle, D. H. (1977). Informational asymmetries, financial structure, and financial intermediation. *The journal of Finance*, *32*(2), 371-387.
18. Maddala, G. S., & Lahiri, K. (1992). *Introduction to econometrics* (Vol. 2). New York: Macmillan.
19. Oh, C. O. (2005). The contribution of tourism development to economic growth in the Korean economy. *Tourism management*, *26*(1), 39-44.
20. Gardel, M. L., Shin, J. H., MacKintosh, F. C., Mahadevan, L., Matsudaira, P., & Weitz, D. A. (2004). Elastic behavior of cross-linked and bundled actin networks. *Science*, *304*(5675), 1301-1305.
21. Adeleke, O. E., Adeniyi, B. A., & Akinrinmisi, A. A. (2000). Microbiological quality of local soymilk: a public health appraisal. *African Journal of Biomedical Research*, *3*(2), 89-92.
22. Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. Journal of applied econometrics, 16(3), 289-326.