

LIQUIDITY MANAGEMENT AND PERFORMANCE OF LISTED DEPOSIT MONEY BANKS (2008-2015)

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Abstract

This study seeks to determine the effect of bank internal factors and macroeconomic factors on deposit money banks' profitability as well as to ascertain the response of non-performing loans to macroeconomic shocks most especially oil price shock. The paper adopts the pooled multiple regression model using secondary panel data from the financial statements of 13 listed deposit money banks for the periods 2008 – 2015. The model incorporates Profit after tax (PAT) as proxy for profitability as the explained variable while capital ratio (CR), deposit to total assets (DTA), net interest margin (NIM), shareholders' funds (SFND), earnings per share (EPS), broad money to total reserves (M2) and inflation (INFL) as explanatory variables. The study also adopted a Bayesian VAR model to ascertain the impulse response of NPL to macroeconomic shocks. Times series data on oil price, risk premium, GDP and inflation shocks were adopted. Result reveals that the effect of NPL on profitability is low however a persistent increase in NPL will affect profitability in the long run. Also NPL will affect the solvency of banks which denotes a long run effect and not significantly the current liquidity position of banks. Analysis of shocks in 2008-2009 revealed the short run significant effect of negative oil price shock on NPL although oil prices have not been the major determinant of persistent increase in NPL. The study also revealed a strong relationship between liquidity and profitability. In conclusion, the study has shown that the level of concentrations of banks to specific sectors (e.g. oil and gas) has not positively affected the banks within the period of oil price fall and economic recession. The study recommends the need for sectoral diversification to reduce risk of loan default and equal concentration given to profit maximization should also be given to effective and efficient liquidity management.

KEYWORDS: *Liquidity, Management, Profitability, Non-Performing Loans, Solvency.*

INTRODUCTION

Liquidity Management is a firm's managerial strategy to efficiently and effectively utilize and monitor its assets and liabilities in order to meet its obligations to its stakeholders and ensure it remains a going concern. Liquidity management is the ability to manage funds efficiently to meet obligations and hence ensure profit. Kaur (2010) asserts that liquidity management is concerned with the most effective choice of liquidity sources and the determination of

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appropriate levels of the current assets and their use. Amalendu (2010), asserts that liquidity management directs our attention also to profitability. This explains that liquidity management influences profitability level (Deloof, 2003, Raheman 2007). In the banking sector, the confidence of depositors is knitted to how efficient and consistent banks are in ensuring payment on withdrawal on demand. Poor liquidity management could induce a bank run which is very dangerous to the bank as well as the economy at large. Effective liquidity management ensures sound liquidity for assurance of long-term economic growth and attainment of profit generating process (Wignaraja & O'Neil, 1999).

Deposit money banks play the role of financial intermediation by channelling excess funds in form of savings from the surplus unit to the deficit unit in form of credit extension. As a result there exists a risk of default on the part of the bank when there is an unanticipated demand on deposit by depositors. According to Ngwu (2006:36), "proper liquidity management ensures having enough fund in reserve and also the ability to raise funds quickly from the market to meet the demands of depositors and other parties with a view to maintain public confidence and be profitable". Profitability which measures the performance of banks is seen by most authors and researchers as the primary objective of every business. Profitability measures the amount by which the revenue gotten from the operations of a firm exceeds its expenses. The profitability of deposit money banks' would instigate and promote a strong banking sector that can withstand unfavourable shocks and ensure stability of the financial system (Athanasoglou, Brissimis & Delis, 2005).

The current oil price shock coupled with the current economic recession in the second quarter of 2016 has left several banks vulnerable to high non-performing loans especially banks with heavy exposure to the oil sector. Non-performing loans to total gross loans (%) rose from 6.254 in 2008 to 37.253 in 2009 which was due to the global financial recession witnessed during that period (World Development Indicators, 2015). According to the CBN financial stability report 2015, Nigerian bank's non-performing loans to total gross loans (%) (NPL/TGL) has risen by 79% from 2.96 in 2014 to 5.324 in 2015. The current CBN governor Godwin Emefiele speaking at the 3rd credit reporting conference organised by the Credit Bureau Association of Nigeria (CBAN) posited that Non-performing Loan of banks had risen to N649.63billion as at the December 2015 (Enejeta, 2016).

The Financial Stability Report June 2016 reported a 158% increase in NPL from N649.63billion to N1, 678.59billion as at June 2016. With recent increases in the NPL of deposit money banks in Nigeria, it can be concluded that NPL is a potential threat to profitability. Some researchers blamed the recent increase in NPLs majorly on the sudden drop in oil price, weakened Naira, slower GDP growth and rising inflation in the economy. This has therefore necessitated effective and efficient liquidity management among DMBs' to ensure profitability during periods of boom and burst.

Deposit money banks are therefore faced majorly with two major corporate objectives which include liquidity maximization (which connotes stakeholder's wealth maximization) and profit maximization. Hence the problem which arises is the determination of the optimum level at

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which banks could realize stated objectives. (Adebayo; David & Samuel, 2011) explains that profit maximization becomes a myth as the resulted liquidity can lead to both technical and legal insolvency with the consequence of low patronage, deposit flight, erosion of asset base.

This research looks at problems such as non-performing loans and the optimum level of liquidity and profitability. In addition, the study looks at the influence of liquidity management on the performance measured by profitability in the Nigerian banking sector.

EMPIRICAL REVIEW

Sangmi (2010) in his study analysing financial performance of commercial banks in India explains that to ensure a sound and satisfactory position, bank management must adopt CAMEL (capital adequacy, asset quality, management capability, earning analysis and liquidity analysis) parameters in its evaluation. Ongore & Kusa (2013) using linear multiple regression model and Generalized Least Square on panel data to estimate parameters on the determinants of financial performance of commercial banks in Kenya found overall effect of macroeconomic variables were inconclusive at 5% significant level. Thus it was concluded that the financial performance of commercial banks is driven majorly by board and management decisions which is an important element in the CAMEL evaluation.

Alshatti (2015) studied the effect of liquidity management on profitability in the Jordanian commercial banks for the time period of 2005-2012 and considered thirteen banks to represent all Jordanian commercial banks. The regression analysis and augmented dickey fuller test for unit root show that an increase in quick ratio and investment ratio of available funds leads to an increase in profitability, while an increase in capital ratio and liquid assets ratio leads to decrease in profitability of Jordanian commercial banks. He concludes that there is a need for an efficient utilization of liquidity into viable investments in order to increase banks' profitability and hence performance.

Agbada & Osuji (2013) asserts that liquidity management should take a more professional approach to ensure a good bank performance. He studied the efficacy of liquidity management and banking performance in Nigeria considering majorly the aftermath of several banking reforms, rescue mission by the Central bank of Nigeria (CBN) and the attendant Merger and Acquisitions through the use of administered questionnaires. Findings clearly state that there is a significant relationship between liquidity management and bank performance of which an efficient liquidity management will enhance the soundness of the bank. The use of questionnaires only to conduct a research on a sensitive concept such as liquidity and profitability is not adequate. The study population was senior, middle and lower executive bank employees of selected bank of which we can ascertain their expertise in the area of liquidity concept and management and how it will affect profitability.

Staikouras (2015), explained in his study that the determinants of European banks that profitability in European banks are majorly affected by external macroeconomic factors beyond



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efficient liquidity management. This result is in contrast to the structure-performance relationships for European banking and finds a positive effect of market share variables on profitability. Adagye (2015), posited that Return on Equity (ROE) and Return on Asset (ROA) which are two important indicators of bank's profitability and performance are positively affected by all elements of working capital management. He further explains that banks are to ensure an efficient liquidity management to achieve desired objectives.

Investments in liquid assets are less profitable compared to investment in long term assets. Banks management are therefore in between making decisions as to investing in long term assets and risk low liquidity or to invest in short term assets which are less profitable and reduce return on investment. To this effect, karani (2014) carried out a research on the effect of liquidity management on profitability of commercial banks in Kenya for the period 2009-2013. Using ROA as an indicator of profitability, findings show that liquidity management is an important factor in determining bank profitability in Kenya. He asserted that maintaining balance between the level of liquid assets and long term assets can be conflicting objectives but maintaining adequate liquidity and sustainable profit can be integrated to enhance performance.

Ibe (2013), randomly selected three (3) banks namely Afribank plc, United Bank of Africa (UBA) and Diamond Bank plc, to represent the Nigerian banking industry using measures such as cash and short term funds, bank balances and treasury bills and certificates for liquidity management while profit after tax (PAT) was used for profitability. The study showed that liquidity management is the major problem of the Nigerian banking industry. He explained the need for qualified personnel in the determination of the optimal level of liquidity and how well to maximize profit. The study made use of only three banks which isn't sufficient enough to represent the entire banking industry in Nigeria. The study also made use of pre-consolidation and post-consolidation periods to analyse data. The study therefore did not take into consideration the several banking reforms, mergers and acquisitions that had taken place after 2005.

Dahiyat (2016), studied liquidity and solvency and its effect on all Jordanian banks' profitability listed on the Amman exchange for the period 2012 – 2014. The study adopted a simple regression analyses with quick ratio to measure liquidity and debt ratio to measure solvency as independent variable whereas return on asset as the dependent variable to measure profitability. It was concluded based on the results that liquidity is inversely related to profitability having a negative significant effect on profitability meanwhile solvency had no impact on profitabilty. However this study didnt give any recommendation as to how liquidity and profitability can be managed to ensure better performance of commercial bnks in Jordan. Another major critique to this paper is the use of only one variable to measure liquidity and also one variable to measure solvency amongst several variables that determines the level of liquidity and solvency among banks. Therefore the problem of insufficient variable was identified as a weakness in this study.



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Caglayan & Talavera (2016) studied the impact credit dollarization had on Turkish commercial banks performance/profitability and liquidity. The study adopted a panel data analysis and the result revealed that banks that lend foreign currencies enjoy high profitability due to less liquid asset held. This explains that liquidity is inversely related to profitability in Turkish commercial banks. The analysis adopted a sample size of 42 banks over the periods 2003Q1 to 2014Q1.

THEORETICAL FRAMEWORK

Commercial Loan Theory

Commercial loan theory is the oldest theory of liquidity management (Francis & Edu, 2016). This theory holds principally that bank funds/deposits should be invested in short-term self-liquidating loans for working capital instead of long-term financing of plants and machineries, land purchases and other long-term projects. According to this theory, banks shouldn't extend long-term loans such as securities purchasing loans, development of building loans, purchasing of investment goods loans, and other long-term borrowing to debtors. The major assumption to this theory is that deposits are not stable which is a major weakness as it doesn't put in consideration "core deposits" such as fixed deposits which enables the bank to be able to lend credit for a reasonable period of time without fear of illiquidity.

This theory maintains that a deposit money bank's liquidity would be assured only when assets are held in short-term loans that would be liquidated in the normal course of business. Banks are expected to finance the movement of goods through the successive stages of production to consumption or what would be called today as inventory or working capital loans. Onoh (2002), opines that for bank liquidity to be assured, the duration of funds sourced from other source or deposit must match the duration of asset i.e. loans and advances to customers. Therefore this study considers the deposit structure of banks and its effect on bank performance.

Liability Management Theory

This theory explains that banks can also meet their liquidity requirement and maintain favourable liquid positions by trading in the market for additional funds to meet obligations (loan demands and deposit withdrawals). The roots of the theory can be traced to the rejuvenation of federal funds markets in the United States in the 1980's and development of negotiable time deposits as a major money market instrument. This theory maintains that instead of banks keeping liquid assets or shifting/transferring assets to institutions with sound financial positions, bank could issue liabilities to meet liquidity needs. A limitation to this theory is that a bank's concentration on the stock market to raise funds can lead to liquidity crisis when investors lose confidence in the bank and refuse to reinvest. Therefore the confidence of investors is paramount to banks under the liability management theory.

Efficient Structure Theory (ES)

The efficiency hypothesis illustrates that the performance of a firm is not a function of the market structure as depicted by the SCP paradigm. Efficiency hypothesis argues from the point that a firm's performance is highly dependent on its level of efficiency which explains its conduct and hence performance measured by profitability. A highly efficient bank in relation to other banks in the financial industry can maximize profit irrespective of its current size,



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policies and operations. However banks can increase in size and market share as a result increased profit generation which invariably leads to market concentration. Two major approaches also explains the ES hypothesis namely; X-efficiency and Scale-efficiency hypothesis.

X-efficiency Hypothesis: Athanasoglou et al (2006), asserted while explaining X-efficiency hypothesis, “more efficient banks are more profitable because of their lower costs. Such banks tend to gain larger market shares, and as a result higher level market concentration. X-efficiency hypothesis does not consider the causal relationship between concentration and profitability as explained by the structure conduct performance hypothesis instead basis banks profitability on its efficiency. Such efficiency can be achieved by management competencies to ensure lower cost and also the level of technology used in production. Therefore the differences in management or production technology among banks results to differences in profit levels (Olweny & Shipho, 2011).

Scale-efficiency Hypothesis: On the other hand, scale-efficiency hypothesis posit that larger banks can obtain lower cost and higher profits through economies of scale which as a result enables large banks to acquire market shares, which may manifest in higher concentration and then profitability (Olweny & Shipho, 2011).

METHODOLOGY

Research Design

This study is a descriptive research with secondary data collated from the annual reports of thirteen deposit money banks in Nigeria for the periods 2008 – 2015. Due to the peculiarity of the study, pooled multiple regression model was adopted in addition to the Bayesian vector auto regression model to capture both the effect of liquidity management on profitability and the effect of macro-economic shocks on non-performing loans hence profitability.

Model Specification

Objective 1: The model is adopted from commercial loan, liability management and scale efficiency theories as the major theoretical channels through which profitability relate to liquidity management and economic growth employing a pooled multiple regression model. The study also imbibes the model specification of (Bordeleau & Graham, 2010) explaining that the relationship that exists between liquidity and profitabilty varies depending on a bank’s business model and the state of the economy.

$$PAT = f (CR, DTA, NPL, NIM, SFND, EPS, M2, INFL)..... (i)$$

Where **PAT** connotes profit after tax

CR connotes capital ratio also known as current ratio which measures the ability of a bank to pay off its current liabilities with its current assets and it is calculated by dividing current assets with current liabilities

DTA connotes deposit to total asset of a bank

NPL connotes non-performing loans to total loans

NIM connotes the net interest margin of a bank

SFND connotes shareholders fund



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EPS connotes earning per share

M2 connotes broad money supply to total reserve ratio

INFL connotes inflation rate at consumer price

This study assumes a non-linear model structured in its explicit form as:

$$PAT = A \cdot CR_t^{\beta1} \cdot DTA_t^{\beta2} \cdot NPL_t^{\beta3} \cdot NIM_t^{\beta4} \cdot SFND_t^{\beta5} \cdot EPS_t^{\beta6} \cdot M2_t^{\beta7} \cdot INFL_t^{\beta8} \cdot \mu_{it} \dots \dots \dots (ii)$$

$\beta1, \beta2, \beta3, \beta4, \beta5, \beta6, \beta7, \beta8$ are parameters to be estimated; $t= 2008-2015$; u_{it} = stochastic term.

$$PAT_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 DTA_{it} + \beta_3 NPL_{it} + \beta_4 NIM_{it} + \beta_5 SFND_{it} + \beta_6 EPS_{it} + \beta_7 M2_{it} + \beta_8 INFL_{it} + \mu_{it} \dots \dots \dots (iii)$$

Objective 2: Analysing the effect of oil price shock on non-performing loans of deposit money banks in Nigeria, the study models the joint dynamics and causal relations between liquidity management on the profitability of quoted deposit money banks based on Bayesian vector autoregression (BVAR) model. The BVAR model is based upon the standard vector autoregressive model (VAR), it is considered to be more efficient for forecasting as it uses prior distribution to overcome the problem of “over-fitting” that is common to VAR models. For the purpose of this study, the Litterman/Minnesota prior distribution technique for estimating BVAR models is adopted. The BVAR model is specified based upon the VAR model, this is shown as follows:

$$Y_t = \beta + \sum_{j=1}^p A_j Y_{t-j} + \mu_t \quad t = 1, \dots, T, \dots \dots \dots (3.7)$$

Where Y_t is a (N x 1) vector of dependent variables, μ_t is a (N x 1) vector of error terms, β is an (N x 1) vector of the intercept, and A_j is an (N x N) square matrix of coefficients. The error term has a normal distribution of zero mean and constant variance.

A VAR system is the generalization of the univariate autoregressive model to a vector of financial variables stated as:

- $NPL = f(OIL, RP, GDP, INFL) \dots \dots \dots (i)$
- $OIL = f(NPL, RP, GDP, INFL) \dots \dots \dots (ii)$
- $RP = f(NPL, OIL, GDP, INFL) \dots \dots \dots (iii)$
- $GDP = f(NPL, OIL, RP, INFL) \dots \dots \dots (iv)$
- $INFL = f(NPL, OIL, RP, GDP) \dots \dots \dots (v)$

The general framework of the VAR model for this study can be written as:

$$\text{Where } Y_t = \begin{bmatrix} LnNPL \\ LnOIL \\ LnRP \\ LnGDP \\ LnINFL \end{bmatrix}; \beta = \begin{bmatrix} \alpha_{NPL} \\ \alpha_{OIL} \\ \alpha_{RP} \\ \alpha_{GDP} \\ \alpha_{INFL} \end{bmatrix}; \mu_t = \begin{bmatrix} \mu_{NPL} \\ \mu_{OIL} \\ \mu_{RP} \\ \mu_{GDP} \\ \mu_{INFL} \end{bmatrix}$$

Where;

NPL represents non-performing loans

OIL represents oil price

RP represents risk premium

GDP represents gross domestic product

INFL represents Inflation



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The equations of the VAR system in the logarithm form for this study are thus presented as follows:

$$NPL_t = \beta_{10} + \sum_{j=1}^p \beta_{11}^j OIL_{t-j} + \sum_{j=1}^p \beta_{12}^j RP_{t-j} + \sum_{j=1}^p \beta_{13}^j GDP_{t-j} + \sum_{j=1}^p \beta_{14}^j INFL_{t-j} + \sum_{j=1}^p \beta_{15}^j NPL_{t-j} + \mu_t^{NPL} \dots (3.8)$$

$$OIL_t = \beta_{20} + \sum_{j=1}^p \beta_{21}^j NPL_{t-j} + \sum_{j=1}^p \beta_{22}^j RP_{t-j} + \sum_{j=1}^p \beta_{23}^j GDP_{t-j} + \sum_{j=1}^p \beta_{24}^j INFL_{t-j} + \sum_{j=1}^p \beta_{25}^j OIL_{t-j} + \mu_t^{OIL} \dots (3.9)$$

$$RP_t = \beta_{30} + \sum_{j=1}^p \beta_{31}^j NPL_{t-j} + \sum_{j=1}^p \beta_{32}^j OIL_{t-j} + \sum_{j=1}^p \beta_{33}^j GDP_{t-j} + \sum_{j=1}^p \beta_{34}^j INFL_{t-j} + \sum_{j=1}^p \beta_{35}^j RP_{t-j} + \mu_t^{RP} \dots (4.0)$$

$$GDP_t = \beta_{40} + \sum_{j=1}^p \beta_{41}^j NPL_{t-j} + \sum_{j=1}^p \beta_{42}^j OIL_{t-j} + \sum_{j=1}^p \beta_{43}^j RP_{t-j} + \sum_{j=1}^p \beta_{44}^j INFL_{t-j} + \sum_{j=1}^p \beta_{45}^j GDP_{t-j} + \mu_t^{GDP} \dots (4.1)$$

$$INFL_t = \beta_{50} + \sum_{j=1}^p \beta_{51}^j NPL_{t-j} + \sum_{j=1}^p \beta_{52}^j OIL_{t-j} + \sum_{j=1}^p \beta_{53}^j RP_{t-j} + \sum_{j=1}^p \beta_{54}^j GDP_{t-j} + \sum_{j=1}^p \beta_{55}^j INFL_{t-j} + \mu_t^{INFL} \dots (4.2)$$

Where the matrix of the innovation can be written as follows:

$$\begin{pmatrix} \varepsilon_t^{NPL} \\ \varepsilon_t^{OIL} \\ \varepsilon_t^{RP} \\ \varepsilon_t^{GDP} \\ \varepsilon_t^{INFL} \end{pmatrix} \sim i. i. d. \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix}, \begin{bmatrix} \delta_{NPL}^2 & 0 & 0 & 0 & 0 \\ 0 & \delta_{OIL}^2 & 0 & 0 & 0 \\ 0 & 0 & \delta_{RP}^2 & 0 & 0 \\ 0 & 0 & 0 & \delta_{GDP}^2 & 0 \\ 0 & 0 & 0 & 0 & \delta_{INFL}^2 \end{bmatrix}$$

Note: NPL, GDP, INFL, OIL, RP are endogenous variables and the exogenous error term are; $\varepsilon_t^{NPL}, \varepsilon_t^{OIL}, \varepsilon_t^{RP}, \varepsilon_t^{GDP}, \varepsilon_t^{INFL}$ which are independently and identically distributed with a mean zero and constant variance.

4.3 Estimation Technique

The study employs the pooled multiple regression model and the Bayesian VAR model to assess the relationship between liquidity and profitability as well as the relationship between bank loans and oil price shocks. The process adopted includes the following Unit root test, cointegration test, granger causality test, stationary test (dickey fuller) and Pearson correlation analysis (PCORR). This study employs a secondary data analysis from the annual report of deposit money banks as well as secondary annual time series data sourced from world development indicators (WDI).

FINDINGS AND DISCUSSIONS

Table 5-1: Summary of Panel Results

Variables	Pooled OLS	Fixed Effect Model	Random Effect Model
Constant	-4.501 (0.111)	10.187 (0.3667)	-3.958 (0.342)
CR	-0.343 (0.017)**	-0.342 (0.021)**	-0.337 (0.000)**
DTA	0.323	0.698	0.528



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	(0.761)	(0.628)	(0.579)
NPL/TL	0.026 (0.097)***	0.016 (0.337)	0.024 (0.143)
M2/TRR	-0.063 (0.793)	0.205 (0.497)	-0.051 (0.878)
EPS	0.002 (0.638)	0.007 (0.092)***	0.003 (0.385)*
LNIM	0.507 (0.042)**	0.373 (0.229)*	0.475 (0.042)*
INF	-0.014 (0.828)	-0.049 (0.479)	-0.016 (0.858)
LSFND	0.655 (0.012)	-0.025 (0.967)	0.647 (0.019)**
F-Statistic	11.994 (0.000)**	6.230 (0.000)**	8.163 (0.000)**
Adjusted R ²	0.603	0.610	0.532
Hausman Test		2.95 (0.8147)	7.8911 (0.4353)
Breusch and Pagan Lagrangian Multiplier Test	3.5559 (0.0592)		

Source: Researcher's compilation from EVIEWS 8.0 (2017), ** significant at 5%, ***significant at 10%

Interpretation and Discussion of Findings

The decision on whether the random effects (RE) model or fixed effects (FE) model was an appropriate model for this study depended on whether the individual effect were fixed or random. Hausman test was conducted to check which model is appropriate between fixed effects and random effects. The result of Hausman test revealed that random-effects model is appropriate since the probability value of 0.8147 higher than greater to 0.05 level of significant (as shown in Table 5-1). The study further double check with the use of Breusch and Pagan Lagrangian multiplier test to determine the model that is appropriate between pooled OLS model and random-effects model, the result confirmed that pooled OLS is appropriate as indicated by probability value of 0.4301 which is greater than 0.05 level of significance (as shown in Table 5-1). Thus, this study accepts the null hypothesis that pool OLS is appropriate at 5 percent significant level. This suggests that variance across the selected banks is zero with no significant difference across unit (that is no panel effect). This implies that the effect of liquidity and other interacting variables on profitability among the selected bank is similar.

Therefore, the discussion of this study is based on the Pool OLS regression estimate results which indicate that the independent variables jointly explained 60 percent variations in the dependent variable (profitability). Also, the probability of F-statistic of 0.00 is less to 0.05 which indicate that the model is statistically significant at 5 percent. Thus, there is linear

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relationship between the independent variables and the dependent variable. Deposit to total asset of the bank (DTA), non-performing loans to total gross loans (NPL/TGL) and earnings per share (EPS) exert positive but statistically insignificant effect on profit after tax at 5 percent significant level. Similarly, money supply to total reserve ratio and inflation rate exert negative but statistically insignificant effect on profit after tax at 5 percent significant level.

However, capital ratio (CR), net interest margin of banks (Inim), and shareholder's fund (sfnd) are statistically significant at 5 percent significant level. Specifically, 1 percent increase in capital ratio induces 0.34 percent decline in profit after tax of the banks, this explains the inverse relationship that exists between liquidity and profitability. Capital ratio measures the amount of current assets available in the bank to meet its current liabilities therefore if banks hold more assets over liabilities, investment level will be low hence lower profitability and vice versa. Also a 1 percent raise in net interest margin of banks induces 0.51 percent improvement in profit after tax of the selected banks. The net interest margin measures the difference between the interest income generated by banks (from investment activities) and amount paid out to their lenders as interest. Therefore, the higher the interest income generated the higher the profit of banks because there will be more money to pump into other investment opportunities and hence generate more income. Similarly, 1 percent increase in shareholders fund induces 0.66 percent improvement in profits after tax (as shown in Table 5-1).

BVAR Stability Test

The Autoregressive (AR) Roots table is used to ascertain whether the BVAR model specified is stable or stationary. This test is necessary as in the situation of an unstable BVAR model; it makes further analysis such as the impulse response and variance decomposition invalid. The AR Roots analysis presents information on the roots and modulus. If the modulus is less than one, then the model is considered to be stable or stationary. However, in the case where there is a violation of this rule, then there will be the need to take the first difference. The initial result of the AR Roots table shows that the model is not stable as there is the inclusion of a modulus greater than one indicating that there is the need to take the first difference. After taking the first difference, the BVAR model becomes stable.

Table 5-2: AR Roots Table after First Difference

Roots	Modulus
0.633555	0.633555
-0.015706 - 0.334505i	0.334873
-0.015706 + 0.334505i	0.334873
0.291743	0.291743
0.151144	0.151144
-0.137104 - 0.007071i	0.137286



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-0.137104 + 0.007071i	0.137286
0.098181	0.098181
-0.074434	0.074434
-0.054275	0.054275

Source: Researcher's compilation using EViews 8.0

Impulse Response Function

The impulse response function is used to examine the effects of a shock to oil price on non-performing loans in Nigeria. From Table 5-3 below, it can be observed that a one percent shock in oil prices brings about a negative effect on non-performing loans in Nigeria. This implies that a sudden disturbance that causes oil prices to increase brings about a fall in the level of non-performing loans in Nigeria and vice versa. Specifically, it can be seen in Table 5-3 below that in the third quarter, a one standard deviation positive shock to oil prices leads to 56.98 percent fall in non-performing loans. Similarly, in the seventh quarter it results to about 89.34 percent decrease in non-performing loans. For the other variables, the effect is negative. This scenario is due to the fact that banks' profits are sticky, so the bank's profits will not change right after the oil shocks; i.e. the effect of a negative shock in oil prices is not immediate on banks' profitability. This could further support the knowledge that negative oil price shocks increases the risk of default in loan repayment which will be revealed upon loan maturity. Subsequently result into a decline in banks' profitability; hence a threat to the solvency of banks. In view of Nigerian deposit money bank's financial results released so far during the studied period, Nigerian banks appear to be experiencing financial ill health as a result of the country's deteriorating macroeconomic conditions caused by low oil prices.



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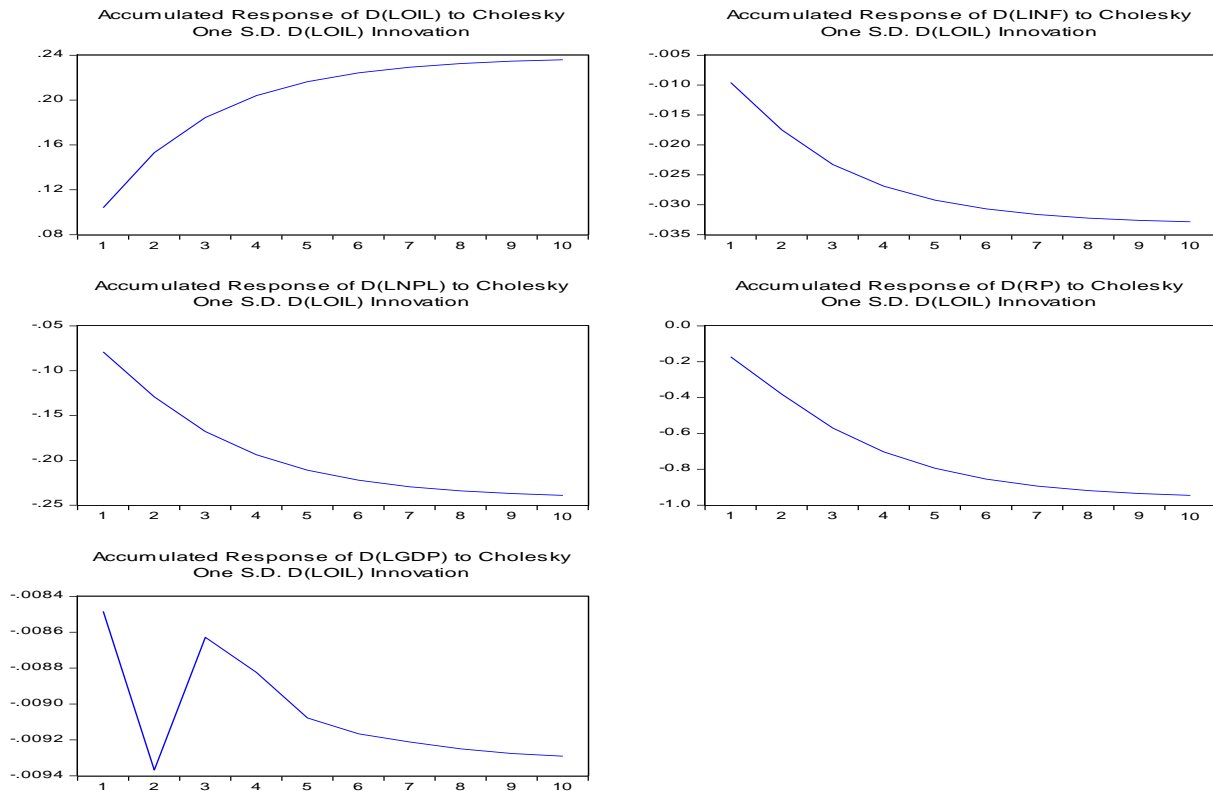


Figure 1: Impulse Response of the Macroeconomic Variables to a Shock in OIL
Source: Researcher's compilation using EViews 8.0

Table 5-3: Impulse Response of the Macroeconomic Variables to a Shock in OIL

Period	LOIL	LINF	LGDP	LNPL	LRP
1	0.103985	-0.009564	-0.079054	-0.172993	-0.008483
2	0.153136	-0.017478	-0.129180	-0.381348	-0.009368
3	0.184484	-0.023285	-0.167981	-0.569814	-0.008629
4	0.203976	-0.026905	-0.193879	-0.703228	-0.008824
5	0.216383	-0.029230	-0.211036	-0.794384	-0.009078
6	0.224283	-0.030700	-0.222226	-0.854371	-0.009166
7	0.229328	-0.031635	-0.229470	-0.893463	-0.009212
8	0.232557	-0.032233	-0.234134	-0.918758	-0.009250
9	0.234626	-0.032616	-0.237132	-0.935056	-0.009276
10	0.235953	-0.032862	-0.239058	-0.945532	-0.009291

Source: Researcher's compilation using EViews 8.0

OBJECTIVE 3

Table 5-4: CORRELATION MATRIX

	PAT	CR	DTA	NPL/TGL	NIM	EPS	M2TRR	SFND
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PAT	1.0000							
	-0.0654							
CR	0.5095	1.0000						
	-0.1118	-0.1345						
DTA	0.2585	0.1734	1.0000					
NPL/TG	-0.2750	-0.0755	-0.0063					
L	0.0047	0.4463	0.9492	1.0000				
	-0.0304	0.0230	-0.0798	-0.0308				
NIM	0.7593	0.8171	0.4208	0.7562	1.0000			
	0.0101	-0.0118	0.0077	-0.0479	0.0946			
EPS	0.9186	0.9052	0.9381	0.6294	0.3395	1.0000		
	0.2240	-0.0051	-0.0108	-0.1498	0.0832	-0.1137		
M2TRR	0.0222	0.9593	0.9131	0.1291	0.4009	0.2505	1.0000	
	0.1814	0.1529	-0.0411	-0.0864	-0.1648	0.0242	0.2022	
SFND	0.0654	0.1212	0.6790	0.3833	0.0946	0.8070	0.0395	1.0000

From the correlation analyses above in table 5-4, the relationship that exist between capital ratio and profitability measured by profit after tax indicates a negative relationship (-0.0654) therefore explaining an inverse relationship. Therefore has capital ratio increases, profitability decreases however, there exist a weak strength of relationship. In the same vein, deposit to total asset also indicates a negative relationship with profitability with a weak strength of association of -0.1118. This explains that an increase in deposit to total asset of banks will reduce profitability as holding more funds and assets to ensure liquidity will mean a reduced activity on investments. Non-performing loans also indicates a negative relationship with profitability. This explains that a movement of non-performing loans upwards will result to a decline in profitability of banks. However the strength of relationship that exist between NPL/TGL and PAT is medium with an approximately -0.3 level of relationship. Net interest margin has a negative relationship with profitability but with a very weak strength of association of -0.0304 level of relationship. Earnings per share also indicates a weak association with profitability of 0.0101 but a positive relationship with profitability. This explains that profitability and earnings per share moves in the same direction. An increase in EPS will also instigate an increase in PAT and vice versa. Similarly with broad money supply to total reserve and shareholders fund respectively with a positive relationship with profitability but a small strength of relationship with PAT given by 0.2240 and 0.1814 respectively.

CONCLUSION

Recalling the effect of non-performing loans on individual banks profitability explaining a 2% reduction in profitability following a 1% increase in non-performing loans as shown in table 5-2 panel analyses, we can conclude that the gravity of non-performing loan's effects on profitability is low initially. This because non-performing loans affects the solvency of banks which denotes a long run effect and not significantly the current liquidity position of banks. If profitability will reduce by 2%, it means a persistent increase in non-performing loans will instigate a continuous reduction of profitability by 2% which will have a long run effect on the



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bank. Therefore we conclude by accepting the null hypothesis that there is no significant effect of non-performing loans on profitability in the short run however in the long run.

From the above study and findings, we can also conclude that increase in non-performing loans isn't healthy for banks and has resulted in the loss registered by some banks between the periods of 2013-2015. This also has revealed the exposure of banks to the oil and gas sector of the economy and the less attention paid to the need for diversification to reduce risk. In the light of this the study has shown that the level of concentrations of banks to specific sectors (e.g. oil and gas) has not positively affected the banks within the period of oil price fall and economic recession. On the basis of the above findings, we recommend that;

1. It is important to note that since liquidity management determines the survival of banks and confidence of customers, equal concentration given to profit maximization should also be given to effective and efficient liquidity management.
2. High concentration on a specific industry for credit facilities extension should be discouraged as unexpected occurrences may adversely affect the stability and financial health of the Nigerian banking sector hence, diversification should be encouraged.

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