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## Impact of Credit Risk Management on the Profitability of Commercial Banks in Nigeria: A Study of First Bank Nigeria Plc

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### ABSTRACT

The study examined the impact of credit risk management on the profitability of Commercial banks in Nigeria. Specifically, the study sought to: determine the impact of loan loss provisions, non-performing loan/ total assets and loans and advances/ total assets on the performance of commercial banks in banks in Nigeria. The study adopted *Ex-post-facto* research design while Multiple Regression Model was used to analyze annual time series data collected from audited annual reports of First Bank of Nigeria Plc for the period 2001-2017. The study found that non-performing loans and loan loss provision have negative and significant impact on bank profitability in Nigeria, while total loans and advances has positive and significant impact on bank profitability in Nigeria. The study concluded that a unit increase in non-performing loans and loan loss provision in the lending portfolio of banks will decrease bank profitability whereas an increase in the total loans and advances will increase bank profitability in Nigeria. It was recommended that Banks should also perfect all the requirements for extending loans and advances to customers so as to control the level of non-performing loans and loan loss provisions thereby enhancing the profitability position of banks in Nigeria.

Keywords: Non-performing loans, loan loss provisions, loans and advances, bank profitability.

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### INTRODUCTION

One of the primary functions of banks is financial intermediation which entails mobilizing financial resources from the surplus to the deficit sectors of the economy. However, banks in the process of financial intermediation create credit and credit creation is the main income generating activity for the banks. In other words, the intermediation function of a bank naturally exposes them to credit risk. Among other risks, such as market risk, operational risk and legal risk; credit risk is by far the most significant risk faced by banks and the success of their business depends on accurate measurement and efficient management of credit risk [1]. Financial intermediation activity involves huge risks to both the lender and the borrower.

[2] opine that credit risk is the degree of value fluctuations in debt instruments

and derivatives due to changes in the underlying credit quality of borrowers and counterparties. [3] defines credit risk as losses from the refusal or inability of credit customers to pay what is owed in full and on time. Credit risk therefore, refers to the potential that a borrower will fail to meet its obligations (principal, interests, commissions) on time or in accordance with the agreed terms. Credit risk is the exposure faced by banks when a borrower (customer) defaults in redeeming debt obligations on due date or at maturity. This risk interchangeably called 'counterparty risk' is capable of putting the bank in distress if not adequately managed.

The main sources of credit risk include, limited institutional capacity, inappropriate credit policies, volatile interest rates, poor management, inappropriate laws, low capital and

liquidity levels, direct lending, massive licensing of banks, poor loan underwriting, laxity in credit assessment, poor lending practices, government interference and inadequate supervision by the central bank [4]. An increase in bank credit risk gradually leads to liquidity and solvency problems. Credit risk may increase if the bank lends to borrowers it does not have adequate knowledge about.

In the banking system, risk management plays an important role and regulators of the banking system are responsible for controlling banks risk exposures in order to avoiding financial and economic crises. Credit risk management needs to be a robust process that enables financial Institutions to proactively manage facility portfolios in order to minimize losses and earn an acceptable level of return for shareholders [5]. Credit risk management refers to measures employed by banks to avoid or minimize the adverse effect of credit risk. Credit risk management according to [6] is a structured approach to managing uncertainties through risk assessment, developing strategies to manage it, and mitigation of risk using managerial resources. The strategies include transferring to another party, avoiding the risk, reducing the consequences of a particular risk. Adequately managing credit risk in financial institutions is critical for the survival and optimal performance of the financial institutions. Credit risk arises from a debtor being unlikely to pay its obligations or deterioration of the financial capacity of the debtor(s) resulting in an economic loss for the bank. Credit risk also arises from loan agreements signed between a bank and individuals, corporations, financial institutions or state. Although, banks loans are the most visible source of credit risk; credit risk equally arises from other banking activities such as on and off balance sheet activities. Banks also faces credit risk when they trade various financial instruments such as bank receipts, interbank transactions, exchange rate transactions, future, swaps and options contracts. The components of credit risk management are loan loss provision, non-performing

loans to total assets and total loans and advances as a ratio of total assets.

Loan loss provision measures non-performing loan as a ratio of total loans [7]; [8]. Loan loss provision is an implicit cost that captures the impact of credit risk exposure of banks in their lending portfolio. Loan portfolio is one of the greatest sources of risk to the quality of bank asset because bank loans and advances basically make up the largest asset and major source of bank revenue. It implies that the level of interest risk inherent in the bank loans might depend on the classification of its loan portfolio. Banks with higher credit risk exposure in their lending portfolio would be required to maintain a higher level of loan loss provision. Variations in loan loss provision affect profitability as well as capital positions of banks which have a strong implication on credit supply. This suggests that loan loss provision is one of factors that affect business cycle volatility indicating that decreases in bank loan loss provisions increases bank lending.

A critical observation of the commercial banks in Nigeria showed that in the year 2000 for instance, the ratio of non-performing loans to total loans of the industry was 21.5% and as at the end of 2001, the ratio had improved to 16.9%. In 2002, 2003 and 2004, the ratio deteriorated to 21.3%, 21.6% and 23.8% respectively. However, in 2005, 2006, 2007 and 2008 there were consistent improvement of; 18.1%, 8.8%, 8.4% and 6.3% respectively (CBN, 2010). Unfortunately, non-performing loans is becoming cyclical in Nigerian banks. The commercial banks recorded an increase in non-performing loans from N344.26 billion as at August, 2013, to N400.57 billion, as at August 2014 which represents a 16.36% increase. Also, total credit delivery recorded a growth rate of 23.8% in 2004, 30.4% in 2005, 40.9% in 2006, 82.7% in 2007 and 62.3% in 2008 (CBN, 2010). Unfortunately, non-performing loans is becoming cyclical in Nigeria. The Deposit Money Banks recorded a N56.31 billion increase in non-performing loans from August 2013 to August 2014. The increase in non-performing loans from N344.26 billion as at August, 2013, to N400.57 billion, as at August 2014, represents a 16.36% increase. Gross

loans of banks also increased from N9.278 trillion in August, 2013 to N11.229 trillion as at August, 2014 and this represents 21.03% increase in gross loans (CBN, 2015).

Adequately managing credit risk in financial institutions is critical for the survival and optimal performance of the financial institutions. A sound credit

risk management framework is crucial for banks so as to enhance profitability and guarantee survival. Credit risk management maximizes bank's risk adjusted rate of return by maintaining credit risk exposure within acceptable limits in order to provide framework for understanding the impact of credit risk management on banks' profitability [9].

#### STATEMENT OF THE PROBLEM

The Central Bank of Nigeria (CBN) in 1990 introduced the prudential guidelines among other measures with a view to ensuring that banks comply with the established guidelines on credit management and other banking activities. Complying with the guidelines would imply that banks are expected to have declining non-performing loans in their lending portfolio as it would signal low credit risk. Despite of the regulations, banks have continued to record rising volume of non-performing loans in the annual reports of individual banks point to the fact that there are indications of rising credit risks among the banks in Nigeria. Rising incidences of non-performing loans portends a great threat to bank performance because deterioration of asset quality affects the profitability of banks.

Despite the efforts of the regulatory authorities to ensure that banks mitigate the effect of credit risk in their lending portfolio; banks have continued to make rising loan loss provisions. Continued large scale loan loss provisions have the capacity to reduce loanable income

which invariably would affect profitability position of banks. As these conditions remain unchecked, the profitability of the bank is also threatened. Bank failures in Nigeria have been attributed to improper lending practices, lack of experience, organizational and informational systems to adequately assess credit risk [10].

#### Objectives of the Study

The broad objective of the study is to investigate the impact of credit risk management on the profitability of banks in Nigeria. The specific objectives of the study are as follows:

1. To determine the impact of loan loss provisions on the performance of commercial banks in banks in Nigeria.
2. To ascertain the impact of non-performing loan/ total assets on the performance of commercial banks in banks in Nigeria.
3. To examine the impact of loans and advances/ total assets on the performance of commercial banks in banks in Nigeria.

#### REVIEW OF RELATED LITERATURE

##### Conceptual Review

##### Concept of Credit Risk

Loans and advances are the largest and the most obvious source of credit risk, however, credit risk could stem from activities relating to both on and off balance sheet transactions (Basel committee on Banking Supervision, 1999). Bank credit inherently contains an element of the risk of default by the debtor. The bank granting the credit has no control over the inherent risk. Thus risk is determined by factor extraneous to the bank such as general unemployment levels, changing socio-economic conditions, debtors' attitudes and political issues. [11] stressed that

credit risk is the risk that an asset or loan becomes irrecoverable, in the case of total default or the risk of delay in servicing of loans and advances. Basel Committee of Banking Supervision (BCBS) (2001) defined credit risk as the possibility of losing the outstanding loan partially or totally due to credit events (default risk). Banks are increasingly facing credit risk (or counterparty risk) in various financial instruments other than loans, including acceptances, interbank transactions, trade financing foreign exchange transactions, financial futures, swaps, bonds, equities, options, and in the extension of commitments and

guarantees, and the settlement of transaction. Basel Committee on Banking Supervision (1999) defined credit risk as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms. Counterparty risk comes from non-performance of a trading partner. [12] defined credit risk as a risk based on the assumption that a borrower would default in repayment to the lender.

Credit risk in banks arises from two sources namely systematic and idiosyncratic. Systematic risk represents the effects of unexpected changes in macroeconomic and financial market conditions on the performance of borrowers. Idiosyncratic risk represents the effects of risks that are peculiar to individuals firms. The real risk from credit is the deviation of portfolio performance from its expected value. However, credit risk is diversifiable, but difficult to eliminate completely. Credit risk arises from the potential that a creditor is either unwilling to perform an obligation or his ability to perform such obligation is impaired, resulting in economic loss to the bank. Hence, when this occurs or becomes persistent, the performance of the bank is affected. In a bank's portfolio, losses often stem from outright default due to inability or unwillingness of a customer to meet commitments in relation to lending, trading, settlement and other financial transactions. Alternatively, losses may result from reduction in assets value due to actual or perceived deterioration in credit quality. Credit risk emanates from a bank's financial exposure to dealing with individuals, corporation, financial institutions or a sovereign. In addition to direct accounting loss, credit risk could also be viewed in the context of economic exposures. This encompasses opportunity costs, transaction costs and expenses associated with a non-performing asset over and above the accounting loss. It can be further sub-categorized on the basis of reasons responsible for default. For instance the default could be due to country in which there is exposure or problems in settlement of financial transaction. Moreover, it does not necessarily occur in isolation, the same

source that endangers credit risk for the banking institution may also expose it to other risk. For instance, a bad portfolio may attract liquidity.

#### **Concept of Bank Profitability**

Bank performance is usually measured by profitability. Also, profitability is normally proxied by two alternative measures: the return on assets (ROA), which is the ratio of profits to assets and return on equity (ROE), which is profit to equity ratio. Generally, ROA shows the ability of banks management to generate profits from the banks' assets, which may be biased due to off-balance-sheet transactions. On the other hand, ROE, which is often referred to as bank's equity multiplier, indicates the return to shareholders on their equity and it equals return on assets times the total assets-to-equity ratio. Banks with high equity and low leverage in the capital structure usually report high ROA, but low ROE. However, the analysis of return on equity (ROE) ignores the high risk associated with high leverage, and bank financial leverage is usually determined by monetary authorities. Hence, ROA emerges as the key ratio for analyzing bank profitability (IMF, 2002). Therefore, for the purpose of this study, ROA, which is measured as running year averages, is used as a proxy for Nigerian bank performance.

#### **Empirical Review**

[13] investigated the impact of credit risk management on the performance of deposit money banks in Nigeria over the period 2000 - 2014 using five banks that had highest asset base. The study used ordinary least square regression model and the results obtained revealed that credit risk management had a positive and significant impact on total loans and advances, the return on asset and return on equity of the deposit money banks. The study recommended that bank managers need to put more efforts to control the non-performing loan by critically evaluating borrowers' ability to pay back.

[14] investigated credit risk management and profitability in deposit money banks in Ekpoma, Edo State, Nigeria using descriptive research. Data were analyzed with Bivariate Pearson Product Moment Correlation (PPMC) using Statistical Package for Social Sciences (SPSS). The study found that

credit risk management has positive significant relationship with profitability of deposit money banks. It was recommended that management of deposit money banks in Nigeria should enhance their skills in credit analysis and loan administration.

[15] investigated the quantitative effect of credit risk management on the performance of Nigeria's Deposit Money Banks (DMBs) over the period of 17 years (1998-2014). The study employed multiple linear regression model to analyze the time series data. The result showed that sound credit management strategies can boost investors and savers confidence in banks and lead to a growth in funds for loans and advances which leads to increased bank profitability.. The findings revealed that credit risk management has an insignificant impact on the growth of total loans and advances by Nigerian Deposit money banks. The study recommends that DMBs in Nigeria should strictly adhere to their credit appraisal policies which ensures that only creditworthy borrowers have access to loanable funds.

[16] examine the impact of credit risk management on the profitability of 6 selected commercial banks listed on the Ghana stock exchange. Data was gathered from the annual reports of the six selected banks and Ghana banking survey for the years under review. The study adopted the Random Effect Model within the panel estimation technique framework. The study used return on equity (ROE) to measure profitability of bank, non-performing loans, loan loss provisions ratio, loan to asset ratio and capital adequacy ratio as credit risk. The study found that non-performing loans, loan loss provisions ratio and loan to asset ratio have significant and negative relationship profitability of banks in Nigeria while capital adequacy ratio had positive significant relationship with profitability of banks in Nigeria. The study recommended that banks should assess and manage credit risk indicators vigorously in order reduce their exposure to these risks.

[17] analyzed the relationship between credit risk and the profitability of five banks on the Palestine Exchange. Profitability was measured by return on equity and return on assets while credit

risk was measured by net charge-offs to total loans and advances, non-performing loans to total loans and advances and pre-provision profit to total loans and advances. Other variables like bank size, leverage and net income growth were included to account for their effects. The study found a weak but positive relationship between credit risk as measured by non-performing loans to total loans and advances and profitability as measured by return on assets. The study also found that bank size was positively related to profitability.

[18] examined the relationship between credit risk management and profitability of commercial banks in Albania using data collected from 16 banks operating in the Albanian banking system from 2005 to 2015. The variables used in the study were profitability(Return on Equity and Return on Assets), Non-performing Loans Ratio and Capital Adequacy Ratio. The study used ordinary least square estimation and multiple regression model. The result showed that non-performing loans have significant negative effect on bank profitability in Albania.

[19] focused their measurement of the impact of credit risk on profitability on 5 commercial banks in the United Kingdom. They used return on assets and return on equity as a measure of profitability, and impairments and non-performing loans as a measure of credit risk. Financial data from 2007 - 2015 were gathered for the analysis and findings were firm on credit risk having a positive relationship with profitability. They also found that banks in the United Kingdom are still indulging in activities which increases their credit risks; a suggestion that no lesson was learnt by these banks from the 2008-2009 financial and credit crisis.

[20] examined the impact of Non-performing Loans on the Performance of Selected Commercial Banks in Nigeria covering the period 2000 - 2013 with special emphasis on Access Bank, United Bank for Africa and Union Bank of Nigeria Plc. The data were analyzed using ordinary least square method and ratio analysis. The study found that return on asset and return on equity have inverse relationship with non-performing loans and loan loss

provision respectively while they are positively related to loans and advances. The study recommended that banks should maintain high credit standards while the Central Apex Bank and other regulatory agencies should maintain high surveillance on banks' credit operations.

[21] investigated the impact of credit risk management on the performance of deposit money banks in Nigeria between 1989 - 2013 using the Error Correction Model and Granger causality techniques. The study found that the selected credit risk management indicators under study significantly impact on the performance of deposit money banks measured as return on equity, return on total assets, and return on shareholders' fund respectively. However, the findings report no evidence of significant granger causality relationship between the various credit risk management indicators and the various measures of performance. It was recommended that given the observed significant relationship between credit risk management and performance, deposit money banks in Nigeria should always pay particular attention to their credit risk management policies in order to significantly improve on the performance of these banks.

[22] examined the impact of loan loss provision on the profitability of Jordanian using a sample of 13 banks listed on Amman Stock Exchange (ASE) over the period 2004-2014. The study provides the evidence that loan loss provision has a negative impact on the profitability of Jordanian commercial banks. This evidence suggests that Jordan banks adjust their loan loss provision due to several motives and, this in turn, leads to negative consequences for their profitability.

[23] examined the impact of credit risk management on the performance of the commercial banks in Sri Lanka. The panel data of a five year period (2009 - 2013) from the selected banks were used to examine the relationship between credit risk and performances. The Return on Assets was used as performance indicator and Loan provision to Total, Loan Provision to Non-Performing Loans, Loan Provision to Total Assets and Non-Performing Loans/ Total Loans were used as

indicators of credit risk. The result shows that non-performing loans and provisions have an adverse impact on the profitability. Therefore, the study recommended the banks to implement an effective tools and techniques to reduce the credit risk management.

[24] investigated the impact of credit risk on banks' performance in Nigeria. A panel estimation of six banks from 2000 to 2013 was done using the random effect model framework. The study found that while credit risk is negatively and significantly related to bank performance; total loan on the other hand has a positive and significant impact on bank performance. This suggests that an increased exposure to credit risk reduces bank profitability. The study recommended that banks should adopt an aggressive deposit mobilization to increase credit availability and develop a reliable credit risk management strategy with adequate punishment for loan payment defaults.

[25] investigated the impact of credit risk on banks' performance in Nigeria. A panel estimation of six banks from 2000 - 2013 was done using the random effect model framework. This study used an unbalanced panel of six Nigeria banks. The study found that credit risk is negatively and significantly related to bank performance, measured by return on assets (ROA). This suggests that an increased exposure to credit risk reduces bank profitability. Also, total loan was found to have a positive and significant impact on bank performance.

[26] critically assessed the effects of credit management on banks' performance in Nigeria over the period 2007-2011. A total of ten (10) listed banks were selected and analyzed using both descriptive statistics and panel linear regression Method. The study revealed that while ratio of non-performing loans has significant negative effect on the performance of banks in Nigeria; secured and unsecured loan ratio and bank's performance was not significant. Hence, the study recommends that banks management should put in place sound lending framework, adequate credit administration procedure and an effective and efficient machinery to monitor lending function with established rules.

[27] studied the impact of credit risk management practices on loan performance in microfinance banking sector of Pakistan. The dependent variable was loan performance and the independent variables were credit terms, client appraisal, collection policy and credit risk control. Descriptive and inferential statistical techniques were used in analyses. The study found that the credit terms and client appraisal have positive and significant impact on the loan performance at 1% significant level, while the collection policy and credit risk control have positive but insignificant impact on loan performance.

[28] investigated poor credit risk management and bank failures in Nigeria. The study adopted survey research design. Simple random sampling technique was used to select the respondents from the top, middle and lower management levels of the managerial echelon of banks. Systematic analysis of data was done using tables and the Chi-Square statistic tools. The study found that poor credit risk management influences bank failures.

[29] examined the impact of credit risk on the interest income of banks in Nigeria from 2000-2014. Unbalanced panel data analysis was used to estimate the model. The study found that non-performing loans, loan loss provision and loans and advances are statistically significant in explaining the variation in interest income across banks in Nigeria, while loans and advances to total deposit is not statistically significant in explaining the variation in interest income across banks in Nigeria. Based on this, the study recommends that regular update of credit policy and adequate measures to monitor loans should be put in place by banks in Nigeria, as these measures will reduce bad loans and ultimately cause a reduction in loan loss provisions.

[30] examined the risk management in the Nigerian banking industry with First Bank of Nigeria Plc as the case study. The data used for the study were collected majorly from primary source through the distribution of questionnaires to respondents in the bank. Simple percentages were used to analyze the respondents' responses to each of the question while Chi-square

and the Analysis of Variance statistic were used to test the stated hypothesis. The study found that Nigeria banking operations are affected more by credit risk and operational risk than market risk. Fraud and forgeries also play adverse role in banking daily operations. However, the risk management techniques put in place by the banks have really curbed or reduced the various risks confronting Nigeria banks. The study recommended that fraud and forgery, operational risk, market risk and system risk which abound in the Nigeria banking operations need to be managed appropriately in order to improve the performances and profitability of the banks.

[31] evaluated the impact of credit risk and liquidity risk management on the profitability of deposit money banks in Nigeria with particular reference to First bank of Nigeria Plc. Descriptive research design was used for the study where questionnaires were administered to a sample size of eighty (80) respondents while the data obtained were presented in tables and analyzed using simple percentages and pearson product moment correlation. The study revealed that there is a significant relationship between credit risk management and bank profitability and there is a significant relationship between bank liquidity and profitability among deposit money banks in Nigeria. It was recommended that deposit money banks should set up effective system of internal controls to monitor the risk control mechanisms in use in order to ensure complete compliance with bank philosophy.

[32] examined the impact of managing credit risk and profitability of banks in Lagos state. Correlation coefficient was used to decide whether or not credit risk management has an impact on profitability. It was then revealed through the analysis of data from the questionnaire that credit risk management operations play a significant role in the profitability and performance of banks in Lagos State.

[33] investigated the impact of credit risk management on the performance of commercial banks in Nigeria. Financial reports of seven commercial banking firms were used to analyze for seven

years (2005 - 2011). The panel regression model was employed for the estimation of the model. While Return on Equity (ROE) and Return on Asset (ROA) were used as the performance indicators; Non-Performing Loans (NPL) and Capital Adequacy Ratio (CAR) were used as credit risk management indicators. The study revealed that credit risk management has a significant impact on the profitability of commercial banks' in Nigeria.

[34] assessed the efficacy of credit risk management on banks performance over the period 2006 - 2010 with union bank plc as a case study. Time series and trend analysis are used for the analysis. The study conclude that credit risk affect the performance of Union Bank PLC and that to maintain high interest income, attention needs to be given to credit risk management especially regarding the lending philosophy of the bank. The study recommended that banks should ensure that loans given out to customers should be adequately reviewed from time to time to assess the level of its risk.

[35] examined the relationships between credit risk and bank's profitability in Nigeria using data on selected banks from 2004 - 2009. Panel data model was used to estimate the relationship that exists among loan loss provisions, loans and advances, non-performing loans, capital adequacy and return on asset. Results showed that sound credit risk management and capital adequacy impacted positively on bank's financial performance with the exception of loans and advances which was found to have a negative impact on banks' profitability in the period under study. The study recommended that Nigerian banks institute appropriate credit risk management strategies by conducting rigorous credit appraisal before loan disbursement and drawdown. It was also recommended that adequate attention be paid to enhance Tier-One capital of Nigerian banks.

[36] while analyzing the credit risk management efficiency in Nigerian commercial banking sector from 2004 through 2009 provides some further insight into credit risk as profit enhancing mechanism. They used regression analysis and found rather an

interesting result that there is a minimal causation between deposit exposure and bank's performance.

[37] examined the impact of credit risk management on financial performance using a causal research design and multiple regression analysis. The independent variables were the CAMEL components (Capital adequacy, Asset quality, Management efficiency, Earnings and Liquidity). It was revealed that capital adequacy, asset quality, management efficiency and liquidity had weak relationship with financial performance (ROE) whereas earnings had a strong relationship with financial performance. The study suggests that CAMEL model can be used as a proxy for credit risk management.

[38] carried out an empirical investigation into the quantitative effect of credit risk on the performance of commercial banks in Nigeria over the period from 2000 to 2010. In their panel model approach, profitability is proxied by return on assets and credit risk by; the ratio of non-performing loan to total loans and advances, ratio of total loans and advances to total deposit and the ratio of loan loss provision to classified loans. Their findings show that the effect of credit risk is similar across banks in Nigeria and that an increase in non-performing loan and loan loss provision reduce profitability. The results further shows that an increase in total loans and advances increase profitability.

[39] investigated the relationship between credit risk and profitability of some selected banks in Ghana, using a panel of six selected banks for a period of five years from 2005 to 2009. Their study represents one of the few attempts to account for credit risk beyond non-performing loans. From their results, credit risk (non-performing loan rate, net charge-off rate, and pre-provision profit as a percentage of net total loans and advances) has a positive and significant relationship with bank profitability. The results indicate that banks in Ghana enjoy high profitability in spite of high credit risk.

[40] investigated the impact of credit risk on the profitability of Nigerian banks, using data on six selected banks for the periods of 2004 - 2008. The ratio of non-performing loans to total loans

and advances and the ratio of total loans and advances to total deposit were used as indicators of credit risk while return on asset was used to proxy bank

profitability. The study found that bank profitability is inversely influenced by the levels of loans and advances, non-performing loans and deposits.

#### THEORETICAL FRAMEWORK

The study adopts information asymmetry theory. Information asymmetry theory was propounded by Akerlof (1970). The theory assumes that financial markets are not perfect and financial intermediaries primarily exist to reduce information and transaction costs that arise from market imperfection between borrowers and lenders. Information asymmetry theory states that it may be complex to differentiate between good/honest and bad/dishonest borrowers and this may result into adverse selection and moral hazard problems. Information asymmetry arises because borrowers (private sector entrepreneurs) generally know more about their investment projects and the willingness to repay than the lenders (banks). Information asymmetry also arises if the banks are not certain in terms of the integrity of the borrowers and the expected return of the projects that they have financed. Information asymmetry makes it difficult to differentiate between honest and dishonest borrowers and as such banks charge the same interest rate on loans and advances extended to both honest and dishonest borrowers [41]. Many potential private sector borrowers who are honest fail to access credit because the banks cannot objectively

establish credit worthiness of borrowers as a result of information asymmetry. Some bad credit risk borrowers have taken advantage of the information asymmetry problems to create multiple bad loans in the Nigerian banking industry.

Information asymmetry problems creates higher interest rate and as interest rate rises above the rate honest borrowers could pay; some honest borrowers will decide not to borrow and this increases the proportion of loans extended to dishonest borrowers who are not likely to repay the loans thus leading to increasing loan default rate. As loan default (non-performing loan) increases, the banks further raises the interest spread to offset the rising financial intermediation costs and this situation adversely affects bank profitability. Information asymmetry emphasizes that lack of information about customers can increase the problems of adverse selection and moral hazard, and as such can exacerbate the quality of bank loans [42]. Information asymmetry describes the situation in which relevant information is not known to all the parties involved in an undertaking [18]. Information asymmetry leads to adverse selection and moral hazard problems.

#### METHODOLOGY

The study adopted *Ex-post facto* research design. The reason for adopting this design is because data on past events was used to investigate the impact of credit risk management on the profitability of commercial banks in Nigeria. Time series data were obtained on annual basis from the annual reports and statement of accounts of First Bank of Nigeria Plc for the period of 17years (2001-2017). This study adopted multiple regression model. Hence, the functional relationship can be expressed as follows:

$$ROA = F(LLP + NPL + TLA) \dots \quad (1)$$

The regression model is expressed in a linear form as follows:

$$ROA_{it} = \beta_0 + \beta_1 LLP_{it} + \beta_2 NPL_{it} + \beta_3 TLA_{it} + U_{it} \dots \quad (2)$$

Where;  $ROA_{it}$  =Net income to total asset (dependent variable).  $(LLP)_{it}$  =Loan loss provision (independent variable).  $NPL_{it}$  =Non-performing loan to total loan (independent variable).  $TLA_{it}$  =Loans and advances to total assets (independent variable).  $\beta_0$  =intercept term or constant factor.  $U_{it}$  = Error term (incorporating omitted factors).  $\beta_1 \dots \beta_3$  =Regression coefficients to be determined.  $i$  = index for individual bank.  $t$  = time effects (year 2001 - 2017)

Descriptive statistical test, Correlation test and Ordinary Least Square (OLS) regression test were carried out while data analyses was done with the aid of E-view Statistical Software 7.0 version was used in data analysis. The decision rule on the statistical significance of the results obtained was based on the probability values of the t-statistic.

Decision Rule 1: Accept the alternate hypothesis and reject the null hypothesis if the P-value is less than the chosen level of significance (0.05). Accept the null hypothesis and reject the alternate hypothesis if the P-value is greater than the chosen level of significance (0.05).

#### DATA PRESENTATION AND ANALYSIS

##### Descriptive Test

**Table 1: Descriptive Result Test(FBN)**

	ROA	NPL	LLP	TLA
Mean	1.605000	19.29944	2.805556	25.73111
Median	2.010000	22.40000	2.100000	25.31000
Maximum	14.07000	36.70000	11.33000	43.39000
Minimum	-9.270000	4.000000	0.740000	15.45000
Std. Dev.	4.521347	8.696954	2.631220	6.298855
Observations	17	17	17	17

**Source:** Researcher`s Compilation from E-view (version 7.0)

Table 1 shows that Return on Assets (ROA) has a mean of 161% with standard deviation of 452% indicating that on the average, the bank recorded high profit with a significant variation from the mean value. Total Loans and Advances (TLA) has a mean value of 257% with standard deviation of 630%, implying that huge credit facilities were given to borrowers with minimum and maximum values of 155% and 434% respectively. The huge credit availability occasioned

the high profits declared by First Bank Nigeria Plc. The credit risk variables of Non-Performing Loan (NPL) and Loan loss Provision (LLP) have positive averages of 193% and 281% respectively over the study period. This shows that on the average, the credit risk in the bank is high. Also, the statistics show a large difference in the variance of the credit risk variables as measured by their standard deviation of 870% and 263% respectively.

##### Unit Root Test

**Table 2: ADF Unit Root Test Result**

Series	ADF @level	5% criticalValue	Order of Integration	Remark
ROA	-4.570046	-3.098896	1(1)	Stationary
NPL	-4.475979	-3.065585	1(1)	Stationary
LLP	-5.012968	-3.065585	1(1)	Stationary
TLA	-5.091948	-3.065585	1(1)	Stationary

**Source:** Researcher`s Compilation from E-view (version 7.0)

The Augmented Dickey-Fuller (ADF) was employed to test for the existence of unit roots in the data using trend and intercept. The ADF Unit Root Result Test

result (table 2) showed that ROA, NPL, LLP and TLA are stationary at first difference and therefore, are integrated of order one 1(1).

**Regression Result****Table 3: Regression Test Result (OLS)**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPL	-0.325226	0.135427	-2.401487	0.0308
LLP	-0.512974	0.516611	-2.992960	0.0076
TLA	0.206459	0.211633	2.975550	0.0458
C	0.279920	4.752456	2.437651	0.0003
R-squared	0.619896	Mean dependent var		1.605000
Adjusted R-squared	0.574160	S.D. dependent var		4.521347
S.E. of regression	4.108808	Akaike info criterion		5.857273
Sum squared resid	236.3523	Schwarz criterion		6.055134
Log likelihood	-48.71546	Hannan-Quinn criter.		5.884555
F-statistic	2.195032	Durbin-Watson stat		2.793412
Prob(F-statistic)	0.000006			

**Sources:** Researchers' Compilation from E-view (version 7.0)

The regression result showed that non-performing loan (NPL) has negative and significant impact on profitability of banks in Nigeria. This is confirmed by the t-value of -2.401487 and p-value of 0.0308. The implication of the finding is that 1unit increase in NPL will cause ROA (profitability) to reduce by 0.325units. The coefficient of non-performing loan (NPL) is -0.325226. This implies that non-performing loan is negatively related to bank profitability in Nigeria, meaning that a unit increase in (NPL) is followed by a decrease in bank profitability in Nigeria.

The regression result indicated that loan loss provision (LLP) has negative and significant impact on profitability (ROA) of banks in Nigeria. This is confirmed by the t-value of -2.992960 and p-value of 0.0076. The implication of the finding is that 1unit increase in LLP will cause ROA (profitability) to reduce by 0.513units. The coefficient of loan loss provision

(LLP) is -0.512974. This implies that loan loss provision is negatively related to bank profitability in Nigeria, meaning that a unit increase in (LLP) is accompanied by a decrease in bank profitability in Nigeria.

The regression result equally indicated that total loans and advances (TLA) have positive and significant impact on profitability (ROA) of banks in Nigeria. This is confirmed by the t-value of 2.975550 and p-value of 0.0458. The implication of the finding is that 1unit increase in TLA will cause ROA (profitability) to increase by 0.206459units. The coefficient of total loans and advances (TLA) is 0.206459. This implies that total loans and advances is positively related to bank profitability in Nigeria, meaning that a unit increase in (TLA) is accompanied by an increase in bank profitability in Nigeria.

**CONCLUSION**

The study concluded that non-performing loans and loan loss provision as measures of credit risk of banks negatively and significantly affects bank profitability in Nigeria. Therefore, accumulation of non-

performing loan in the lending portfolio of banks as well as increasing loan loss provision adversely affect bank profitability while total loans and advances has positive and insignificant effect on bank profitability in Nigeria.

## RECOMMENDATIONS

Based on the findings, the study recommended as follows:

1. That there is need to strengthen supervision framework of banks by the regulatory authorities with a view to reducing the increasing level of non-performing loans in the lending portfolio of banks in the future.
2. That banks should curtail the rising level of loan loss provision in the lending portfolio of banks in order to boost the profitability of banks.
3. That banks should perfect all the requirements for extending loans and advances to customers so as to control the level of non-performing loans and enhance the profitability position of banks in Nigeria.

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**APPENDIX****APPENDIX 1: Raw Data**

<b>YEARS</b>	<b>ROA</b>	<b>NPL</b>	<b>LLP</b>	<b>TLA</b>
<b>2001</b>	2.34	22.37	2.35	18.02
<b>2002</b>	1.72	25.51	2.67	23.97
<b>2003</b>	2.00	25.74	2.48	23.86
<b>2004</b>	2.11	23.28	2.62	25.98
<b>2005</b>	2.35	19.49	2.78	26.48
<b>2006</b>	1.94	17.50	2.33	27.16
<b>2007</b>	1.96	16.85	3.8	12.59
<b>2008</b>	2.73	23.84	2.36	29.05
<b>2009</b>	-6.42	22.43	2.31	26.68
<b>2010</b>	14.07	23.37	5.39	38.78
<b>2011</b>	-9.27	5.64	3.69	39.87
<b>2012</b>	0.89	7.24	0.68	36.03
<b>2013</b>	0.58	4.73	0.03	29.52
<b>2014</b>	2.1	42.74	0.01	35.94
<b>2015</b>	2.32	44.27	0.04	38.35
<b>2016</b>	2.12	43.32	0.05	37.58
<b>2017</b>	2.23	42.53	0.03	38.21

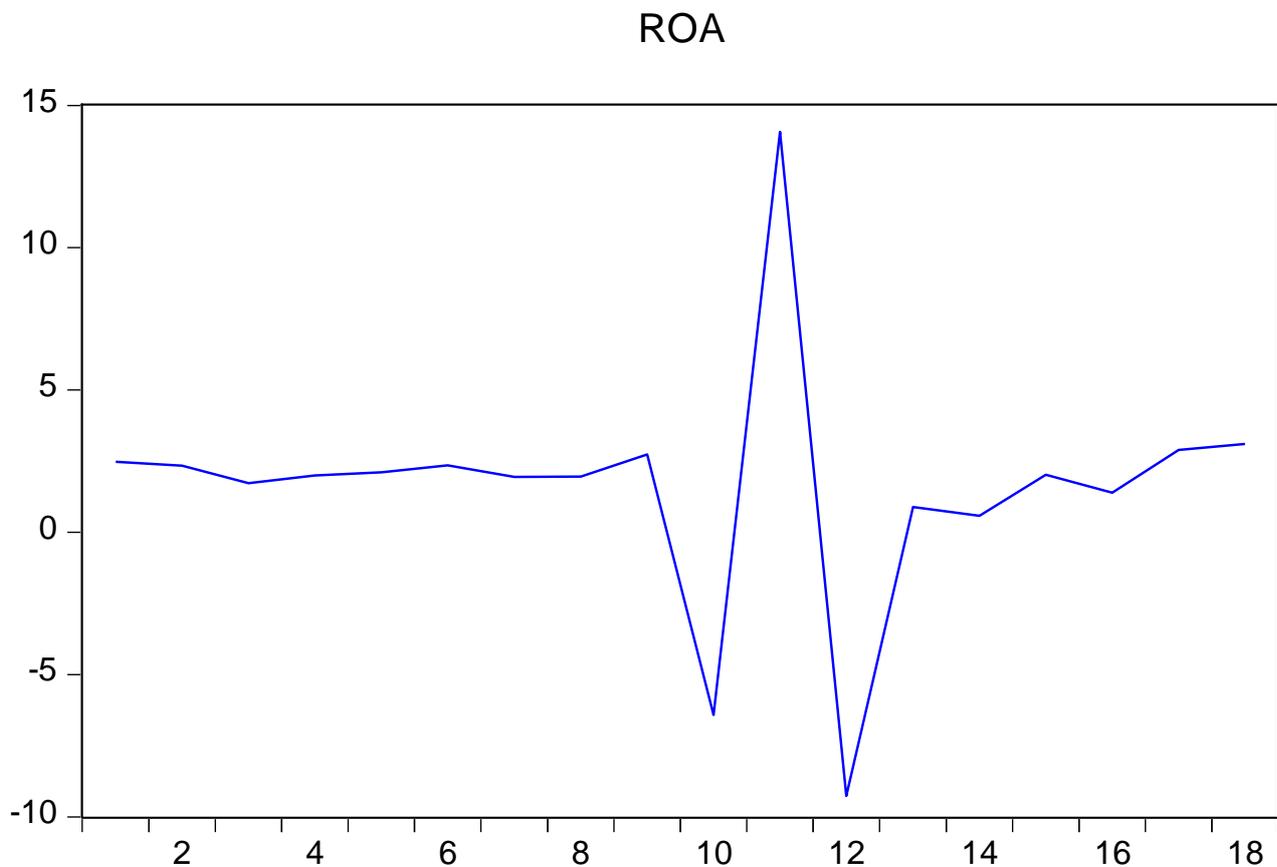
**Source:** Computed from First Bank Nigeria Plc Financial Statement for various years.

**APPENDIX 11: Regression Results**

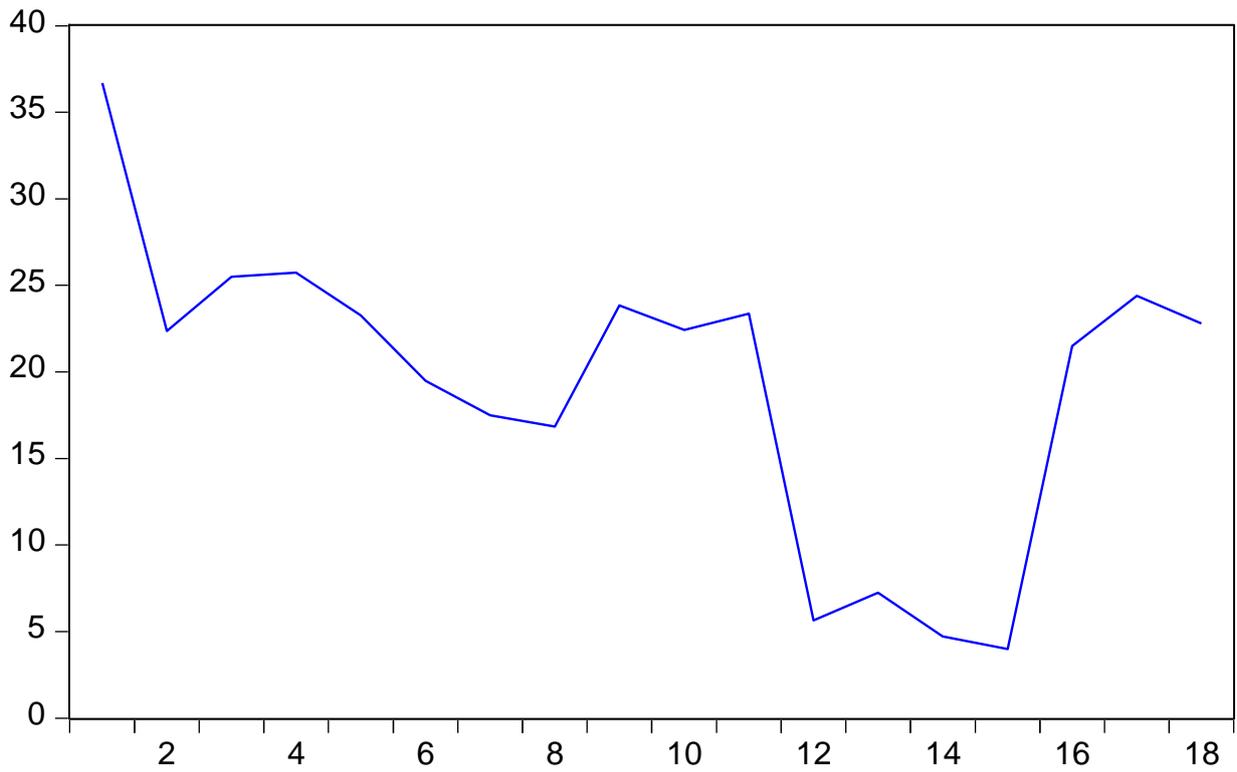
Descriptive Test (First Bank Nig. Plc.)

	ROA	NPL	LLP	TLA
Mean	1.605000	19.29944	2.805556	25.73111
Median	2.010000	22.40000	2.100000	25.31000
Maximum	14.07000	36.70000	11.33000	43.39000
Minimum	-9.270000	4.000000	0.740000	15.45000
Std. Dev.	4.521347	8.696954	2.631220	6.298855
Skewness	0.092417	-0.437211	2.066777	0.989250
Kurtosis	6.302622	2.751420	7.164256	4.673622
Jarque-Bera	8.206106	0.619805	25.82048	5.036605
Probability	0.016522	0.733518	0.000002	0.080596
Sum	28.89000	347.3900	50.50000	463.1600
Sum Sq. Dev.	347.5239	1285.829	117.6964	674.4848
Observations	17	17	17	17

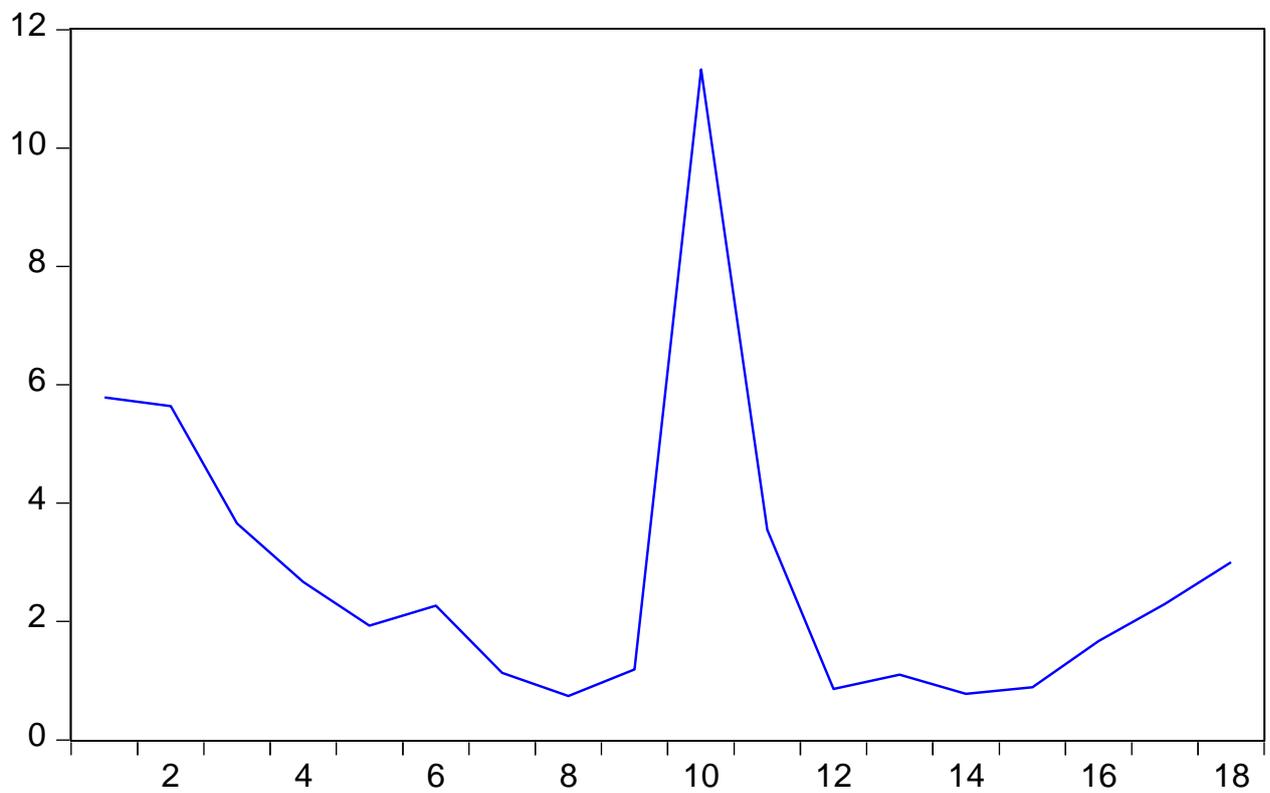
Graph



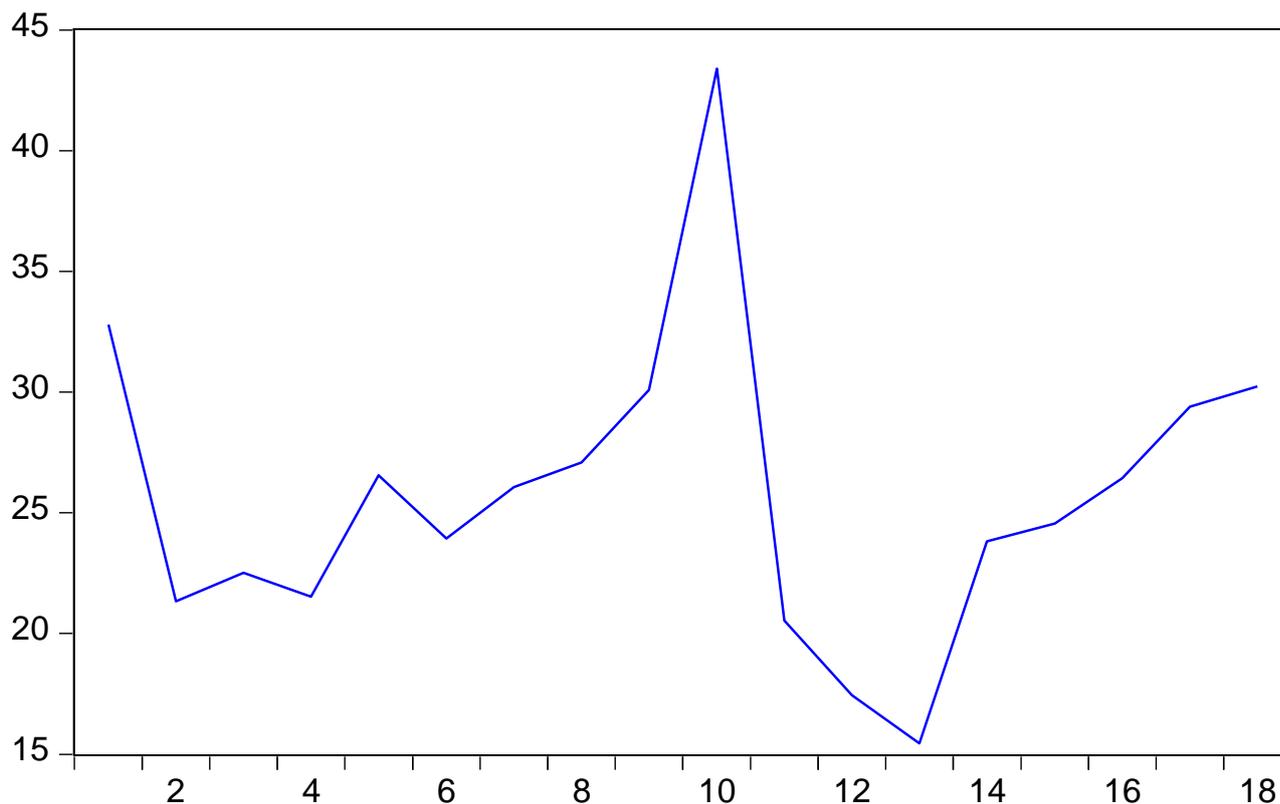
### NPL



### LLP



### TLA



### Correlation

	ROA	NPL	LLP	TLA
ROA	1.000000	0.342967	-0.172091	-0.187635
NPL	0.342967	1.000000	0.497404	0.466323
LLP	-0.172091	0.497404	1.000000	0.642259
TLA	-0.187635	0.466323	0.642259	1.000000

### Unit Root Test

Null Hypothesis: D(ROA) has a unit root  
 Exogenous: Constant  
 Lag Length: 2 (Automatic - based on SIC, maxlag=3)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.570046	0.0037
Test critical values: 1% level	-4.004425	
5% level	-3.098896	
10% level	-2.690439	

\*MacKinnon (1996) one-sided p-values.  
 Warning: Probabilities and critical values calculated for 20

observations  
and may not be accurate for a sample size of 14

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(ROA,2)  
Method: Least Squares  
Date: 11/04/18 Time: 14:46  
Sample (adjusted): 5 18  
Included observations: 14 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ROA(-1))	-4.204437	0.919999	-4.570046	0.0010
D(ROA(-1),2)	1.651730	0.681678	2.423035	0.0359
D(ROA(-2),2)	0.457991	0.282975	1.618485	0.1366
C	0.113391	1.243560	0.091182	0.9291
R-squared	0.947782	Mean dependent var	0.005714	
Adjusted R-squared	0.932116	S.D. dependent var	17.85569	
S.E. of regression	4.652218	Akaike info criterion	6.147521	
Sum squared resid	216.4313	Schwarz criterion	6.330109	
Log likelihood	-39.03265	Hannan-Quinn criter.	6.130620	
F-statistic	60.50115	Durbin-Watson stat	2.187065	
Prob(F-statistic)	0.000001			

Null Hypothesis: D(NPL) has a unit root  
Exogenous: Constant  
Lag Length: 0 (Automatic - based on SIC, maxlag=3)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.475979	0.0035
Test critical values: 1% level	-3.920350	
5% level	-3.065585	
10% level	-2.673459	

\*MacKinnon (1996) one-sided p-values.  
Warning: Probabilities and critical values calculated for 20 observations  
and may not be accurate for a sample size of 16

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(NPL,2)  
Method: Least Squares  
Date: 11/04/18 Time: 14:47  
Sample (adjusted): 3 18  
Included observations: 16 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NPL(-1))	-1.060775	0.236993	-4.475979	0.0005
C	-0.019846	1.807019	-0.010983	0.9914

R-squared	0.588651	Mean dependent var	0.795625
Adjusted R-squared	0.559269	S.D. dependent var	10.83222
S.E. of regression	7.191245	Akaike info criterion	6.900074
Sum squared resid	723.9961	Schwarz criterion	6.996648
Log likelihood	-53.20059	Hannan-Quinn criter.	6.905020
F-statistic	20.03439	Durbin-Watson stat	1.902680
Prob(F-statistic)	0.000523		

Null Hypothesis: D(LLP) has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=3)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.012968	0.0013
Test critical values: 1% level	-3.920350	
5% level	-3.065585	
10% level	-2.673459	

\*MacKinnon (1996) one-sided p-values.  
 Warning: Probabilities and critical values calculated for 20 observations  
 and may not be accurate for a sample size of 16

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(LLP,2)  
 Method: Least Squares  
 Date: 11/04/18 Time: 14:48  
 Sample (adjusted): 3 18  
 Included observations: 16 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LLP(-1))	-1.286655	0.256665	-5.012968	0.0002
C	-0.227527	0.858491	-0.265031	0.7948

R-squared	0.642217	Mean dependent var	0.053125
Adjusted R-squared	0.616661	S.D. dependent var	5.534507
S.E. of regression	3.426656	Akaike info criterion	5.417515
Sum squared resid	164.3876	Schwarz criterion	5.514089
Log likelihood	-41.34012	Hannan-Quinn criter.	5.422461
F-statistic	25.12985	Durbin-Watson stat	2.143568
Prob(F-statistic)	0.000190		

Null Hypothesis: D(TLA) has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=3)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.091948	0.0011
Test critical values: 1% level	-3.920350	

5% level	-3.065585
10% level	-2.673459

\*MacKinnon (1996) one-sided p-values.

Warning: Probabilities and critical values calculated for 20 observations

and may not be accurate for a sample size of 16

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(TLA,2)

Method: Least Squares

Date: 11/04/18 Time: 14:48

Sample (adjusted): 3 18

Included observations: 16 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
	t			
D(TLA(-1))	-1.225360	0.240647	-5.091948	0.0002
C	0.508361	1.879936	0.270414	0.7908

R-squared	0.649368	Mean dependent var	0.768750
Adjusted R-squared	0.624323	S.D. dependent var	12.26409
S.E. of regression	7.516962	Akaike info criterion	6.988670
Sum squared resid	791.0661	Schwarz criterion	7.085244
Log likelihood	-53.90936	Hannan-Quinn criter.	6.993615
F-statistic	25.92794	Durbin-Watson stat	2.092480
Prob(F-statistic)	0.000164		

Cointegration Test

Date: 11/04/18 Time: 14:45

Sample (adjusted): 3 18

Included observations: 16 after adjustments

Trend assumption: Linear deterministic trend

Series: ROA NPL LLP TLA

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesize		Trace	0.05	
d	Eigenvalue	Statistic	Critical Value	Prob.**
No. of CE(s)				
None *	0.964612	91.57341	47.85613	0.0000
At most 1 *	0.809951	38.11144	29.79707	0.0044
At most 2	0.362059	11.54390	15.49471	0.1801
At most 3 *	0.238134	4.351752	3.841466	0.0070

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesize	Max-Eigen	0.05
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(0.93852) (0.39226)

Adjustment coefficients (standard error in parentheses)

D(ROA)	-1.318261	0.154600
	(0.96488)	(0.10072)
D(NPL)	3.885879	-0.226256
	(1.72368)	(0.17993)
D(LLP)	0.770740	-0.002845
	(0.98246)	(0.10256)
D(TLA)	1.527920	0.172367
	(1.24147)	(0.12960)

3 Cointegrating Equation(s):

Log likelihood -110.2271

Normalized cointegrating coefficients (standard error in parentheses)

ROA	NPL	LLP	TLA
1.000000	0.000000	0.000000	-0.984651
			(0.14291)
0.000000	1.000000	0.000000	-9.429478
			(1.62446)
0.000000	0.000000	1.000000	-1.003982
			(0.25122)

Adjustment coefficients (standard error in parentheses)

D(ROA)	-0.360041	-0.017994	0.958010
	(0.89104)	(0.11182)	(0.60060)
D(NPL)	4.189425	-0.280931	-0.245291
	(1.94778)	(0.24444)	(1.31288)
D(LLP)	-0.216078	0.174900	-1.653204
	(0.90192)	(0.11319)	(0.60793)
D(TLA)	0.434354	0.369339	-3.281927
	(1.20761)	(0.15155)	(0.81398)

OLS without Log

Dependent Variable: ROA  
 Method: Least Squares  
 Date: 11/09/18 Time: 14:49  
 Sample: 1 18  
 Included observations: 17

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPL	0.325226	0.135427	-2.401487	0.0308
LLP	-0.512974	0.516611	-2.992960	0.0076
TLA	-0.206459	0.211633	2.975550	0.0458
C	0.279920	4.752456	2.437651	0.0003

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R-squared	0.619896	Mean dependent var	1.605000
Adjusted R-squared	0.574160	S.D. dependent var	4.521347
S.E. of regression	4.108808	Akaike info criterion	5.857273
Sum squared resid	236.3523	Schwarz criterion	6.055134
Log likelihood	-48.71546	Hannan-Quinn criter.	5.884555
F-statistic	2.195032	Durbin-Watson stat	2.793412
Prob(F-statistic)	0.000006		

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OLS with Log

Dependent Variable: LROA  
 Method: Least Squares  
 Date: 11/09/18 Time: 14:55  
 Sample: 1 18  
 Included observations: 16

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Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNPL	0.366809	0.406780	2.901738	0.0049
LLL	0.243243	0.356322	2.682650	0.0078
LTLA	0.017284	0.989264	2.017472	0.0063
C	-0.504866	2.822011	-3.178903	0.0010

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R-squared	0.606292	Mean dependent var	0.759139
Adjusted R-squared	0.532865	S.D. dependent var	0.663704
S.E. of regression	0.618042	Akaike info criterion	2.087796
Sum squared resid	4.583706	Schwarz criterion	2.280943
Log likelihood	-12.70237	Hannan-Quinn criter.	2.097687
F-statistic	1.766116	Durbin-Watson stat	1.986057
Prob(F-statistic)	0.000029		

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