Asset Quality and Deposit Money Banks Performance in Nigeria

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Abstract
This study investigate the relationship between asset quality and deposit money banks performance in Nigeria over a period of 30 years ranging from 1986 to 2016, utilizing time series data collected from the Nigeria deposit insurance corporation annual reports and accounts, CBN financial stability report and CBN statistically bulletin for various years. The variables of study includes return on asset (ROA) proxy for Deposit Money Bank performance in Nigeria, ratio of non-performing loan to total loan (NPL), ratio of liquid assets to total assets (LAT) and ratio of liquid assets to short term liabilities (LAS) as measures of asset quality. The study utilizes both the descriptive and econometric techniques to analyze the time series data. The result shows that there is a short run relationship between asset quality and deposit money bank performance in Nigeria. Also, the co-integration result reveals the presence of a long run relationship between asset quality and deposit money bank performance in Nigeria while the granger causality result shows evidence of causality between asset quality and deposit money bank performance in Nigeria. Based on this we conclude by saying that maintaining sound assets quality position is critical to the long term performance, survival and sustainability of DMBs in Nigeria.
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Keywords: Asset Quality, Deposit Money Banks Return on Assets, Liquid Assets to Short Term Liabilities

INTRODUCTION

The issue of poor assets quality or in other words non-performing assets has gained increasing attention in the academia for some decades now. Deteriorating asset quality was a permanent characteristic of banking institutions in Nigeria. This was not unconnected with weak credit policies and practices, insider abuses and unstable macroeconomic environment. Non-performing assets (NPA) reached alarming levels in the late 90s sometimes in excess of fifty percent (50%) of gross credit. This led to the collapse of more than 30 banks in 1998, several community banks, primary mortgage institutions and finance companies. In 2009 the non performing assets ratio of 10 banks including the intervened banks averaged 54.2 percents (Oni, 2012). Going by this, Nigeria as a nation has so far witnessed series of banking crises. These series of failure experienced in the nation's banking sector over this periods can be captured by the number of failed financial banks, spate of poor assets, the debt and capitalization requirement, erosion of depositors and investors fund and the general effects on the economy (Iwedi, 2017). These crises (1936-1968, 1968-2000, 2000-2004, and 2004-2011) led to the closing down of over 58 deposit money banks (CBN, 1968, NDIC, 2002, Nzotta, 2004, Adeyemi, 2011 and Ohwofasa&Mayuku, 2012 and Iwedi, 2017).

However, vast of studies on the effect of credit risk or non performing loan and performance of banking institutions in Nigeria have well been documented from both theoretical and empirical perspectives with the help of regression estimation techniques. But to the best knowledge of the researcher very fragmented studies of citable significance have dealt on the issue of asset quality and Deposit money banks (DMBs) performance in Nigeria. Among such works are the scholarly works of Abata, (2014), and Lucky &Nwosi, (2015) that studied assets quality and performance of fifteen selected commercial banks quoted on the Nigeria Stock Exchange. Based on this gap, this work is carried out to investigate the effects of asset quality on performance of twenty two (22) deposit money banks in Nigeria using the estimation of the ordinary least square (OLS) technique. Since the OLS technique have become very popular estimation techniques in investigating the link and the velocity of adjustment of variables under study. Therefore, it is important we used this estimation tool to bridge the knowledge gap and to find another perspective.

LITERATURE REVIEW
Asset Quality

Conceptually, in the banking industry, asset quality refers to the review or an evaluation, which assesses the credit risk associated with any particular assets that normally requires the payments of interest like investment and loans portfolios. Ombaba (2013) defined asset quality as the general risk attached to various assets held by financial institution. It is commonly used by financial institution to determine how many of their assets are at financial risk and how much allowance for potential losses they must make. The most common assets of banks requiring a strict determination of asset quality are loans and advances. Increasing loan quality will increase the return of financial institution loans and reduce the costs of failure, but at the same time it will be attained at a cost that requires banks' attention to manage (Khalid, 2012). The support of asset quality is an essential feature of bank (Gulia 2014). Asset quality of the bank is one of the main issues whenever research on banks is conducted (Chisti 2012). How efficient and effective is the bank management in monitoring and controlling credit risk can also have an effect on the kind of credit rating given.

Conceptual Framework of Profitability

Profitability connotes a situation where the income generated during a given period exceeds the expenses incurred over the same length of time for the sole purpose of generating income Banwo (1997), Sanni (2006). The fundamental requirements here are that the income and the expenses must occur during the same period of time (Matching Concept) and the income must be a direct consequence of the expenses. The period of time may be one week, three months, one year etc. Sabo (2007). It is not immaterial whether or not the income has been received in cash nor is it compulsory that the expenses must have been paid in cash. The term profit can take either its economic meaning or accounting concept which shows the excess of income over expenditure viewed during a specified period of time.

THEORETICAL LITERATURE
Agency Theory

The agency problem was developed by Coase (1960), Jensen and Meckling (1976) and Fama and Jensen (1983). The theory states the relationship between principals such as a shareholders, and agents such as a firm's senior management. The principal delegates work to an agent. The theory attempts to deal with firstly, the agency problem where there is a conflict of interest between a company's management and the company's stockholders, and secondly, that the principal and agent settle for different risk tolerances. There are two main agency relationships in a firm that are normally in conflict; those between the company's management and stockholders and between the stockholders and the debt holders. These agency conflicts have implications on corporate governance and business ethics. Such relationships have expensive agency costs that are incurred so as to sustain an effective agency relationship. Incentive fees paid to agents to encourage behavior consistent with the principal's goals are common examples of agency costs Bowie and Edward (1992).

Market Power Theory

Market power theory emanated from Bain (1951). This theory stresses that an increase in market power results to a monopoly, profits (Athanasoglou, Brissimis& Delis, 2005). The theory is based on the premise that concentration of the market is a best measure for market power since more concentrated markets exhibit superior market imperfections facilitating various entities to set prices for their products and services at levels which is less favourable to their clients or customers (Punt and Rooij, 2001). The theory also affirms that companies with a large market share and sound differentiated products and services can easily earn monopolistic profits and succeed or win against their competitors (Nkegbe&Yazidu, 2015). The market power theory assumes that extra profits results from a higher market concentration which allows commercial banks to collude and earn supernormal profits which arise due to the firms portfolio of differentiated products that also increases the market share and market power in determining prices for products (Mirzaei, 2012).

Efficiency Theory

The efficiency theory was formulated by Demsetz (1973) as an alternative to the market power theory. The efficiency theory presupposes that better management and scale efficiency results to higher concentration thus greater and higher profits. Accordingly, the theory posits that management efficiency not only increases profits, but also results to larger market share gains and improved market concentration (Athanasoglou, Brissimis& Delis, 2005). The efficiency theory also states that a positive concentration profitability relation may be a sign of a positive connection relating to efficiency and size. The theory postulates that positive association between the concentration

and profit arise from a lower cost which is mainly achieved through production efficient practices and increased managerial process (Birhanu, 2012).

Empirical Literature

Lucky and Nwosi (2015) examined the relationship between asset quality and the profitability of the fifteen (15) quoted commercial banks in Nigeria from 1980 – 2013. The objective was to investigate the relationship between CAMELS criteria for asset quality and the profitability performance of Nigerian commercial banks. Secondary data were sourced from annual reports of the quoted commercial banks. Return on Investment (ROI) was modeled as the function of percentage of non-performing loans to Total Loans (NPL/TL), percentage of Nonperforming Loans to Total Customers' Deposit (NPL//TCD), percentage of Loan Loss Provision to Total Loans (LLP/TL) and percentage of Loan Loss Provision to Total Asset (LLP/TA). Multiple regressions with econometric view statistical package were used as data analysis method. The Ordinary Least Square properties of Augmented Dickey Fuller Test, Co-integration and Granger Causality test were employed to determine the short and long –run relationship between the dependent and the independent variables. Findings from the regression result proved that percentage of non-performing loans to Total Loans and percentage of nonperforming Loans to Total Customers' Deposit have positive relationship with Return on Investment while percentage of Loan Loss Provision to Total Loans and percentage of Loan Loss Provision to Total Asset have negative relationship with Return on Investment of the commercial banks. The Unit Root test shows stationarity of the variables in order of 1(1), the co-integration reveal long run relationship between the variables while the granger causality reveals no causal relationship among the variables. The model summary proved that the independent variables can explain 65.5% variation on the dependent variables while the F-statistics of 12.508477 and the probability of 0.000008 proved that the model is significant. The study concludes that there is significant relationship between asset quality and the profitability of the commercial banks.

Lis, *et al.* (2000) found that GDP growth and bank specific characteristic (bank size and Capital) had negative effect on bank assets quality while credit growth, collateral, net interest margin, debt-equity, market power and regulation regime had a positive impact on bank assets. Cantrell (1994) pin pointed that asset quality is one of the main concerns in the formula for evaluating the top one hundred U.S. banks stated in U.S.

Abata (2014) examined assets quality and bank performance of six largest banks quoted in Nigeria stock exchange using secondary data sourced from the annual reports of the commercial banks for fifteen years (1999 – 2013). The study adopted the use of ratios as a measure of bank performance and asset quality since it is a verifiable means for gauging the firms level activities while the data were analyzed using the Pearson correlation and regression tool of the SPSS 17.0. The findings revealed that assets quality has a statistically relationship and influence on bank performance.

Swamy (2015) revealed that private sector credit was found not to be significant in affecting the non-performing assets contrary to the general perception and similar in the case with rural branches implying that aversion to rural credit is falsely founded perception. Bad debts are dependent more on the performance of the industry than other sectors of the economy. Furthermore, Capital adequacy and investment activity significantly affect the profitability of commercial banks apart from other accepted determinants of profitability; assets size has no significant impact on profitability.

Literature Gap

So far we have reviewed the literature on the effect of asset quality and profitability of banking institution in different countries. Some of the studies reviewed were cross-country while others were country-specific. However, vast of studies on the effect of credit risk or non performing loan and performance of banking institutions in Nigeria have well been documented from both theoretical and empirical perspectives with the help of regression estimation techniques. But to the best knowledge of the researcher very fragmented studies of citable significance have dealt on the problem of asset quality and Deposit money banks (DMBs) performance in Nigeria. Such as Abata, 2014 and Lucky &Nwosi, 2015 who only studied assets quality and performance of selected commercial banks quoted on the Nigeria Stock Exchange. Therefore, the study is embarked on to examine the effect of asset quality on performance of deposit money banks in Nigeria using the estimation of the ordinary least square technique. Since the OLS technique have become very popular estimation techniques in investigating the nature of the link and the velocity of adjustment in each of the variables under study. Therefore, it is important we used this estimation tool to bridge the knowledge gap and to find another perspective.

RESEARCH METHODOLOGY

The study adopted the quasi-experimental research design. Target population is the specific population from which information is required. The population of this study comprised of all the financial institutions operating in Nigeria. The data for this study are time series data ranging from 1986 – 2016. The data consist of yearly data of one dependent variables of return on assets and three independent variable of banking system assets quality indicators.

Model Specification

Following the previous works of Abata, (2014) and Swamy, (2015) we model the relationship between asset quality and profitability of deposit money banks in Nigeria as follow:

$$ROA_t = f(NPL_t\, LAT_t\, LAS_t) \qquad (3.1)$$

To have the estimable version of above equation, equation (10) can be rewritten to have

$$ROA_t = \alpha_0 + \beta_1 NPL_{t-1} + \beta_2 LAT_{t-2} + \beta_3 LAS_{t-3} + \mu_{it} \qquad (3.2)$$

Where
ROA = Return on Assets

NPL=Non-Performing Loans to Total Loans

LAS =Liquid Assets (core) to Total Assets

LSA =Liquid Assets (core) to Short term Liabilities

$\phi_0\ \alpha_0$ = Constant

$\beta_1 - \beta_3$ = Coefficients of independent variables

μ_{it} = Error Term

TECHNIQUES OF ANALYSIS

ORDINARY LEAST SQUARE REGRESSION ANALYSIS

Ordinary least squares (OLS)is a method for estimating the unknown parameters in a linear regression model. Hutcheson (2011) defined ordinary least square (OLS) regression as a generalized linear modeling technique that may be used to model a single response variable which has been recorded on at least an interval scale. This method minimizes the sum of squared vertical distances between the observed responses in the dataset and the responses predicted by the linear approximation.

UNIT ROOT TEST

A unit root test is a statistical test for the proposition that in a autoregressive statistical model of a time series, the autoregressive parameter is one. (Econtermsy(t), where t a whole number, modeled by:
y(t+1) = ay(t) + other terms
Where a is an unknown constant, a unit root test would be a test of the hypothesis that a=1, usually against the alternative that |a| is less than 1.
Mackinnon critical value.

COINTEGRATION TEST

Cointegration is a statistical property of time series variables. In a situation where two or more series are individually integrated (in the time series sense) but some linear combination of them has a lower order of integration, then the series are said to be cointegrated. According to (C T Eviews 2010) Cointegration refers to a

scenario where linear combination of non stationary variables is stationary. For these non-stationary time series variables, there is a possibility of estimation by differencing in cases where the differences are stationary.

GRANGER CAUSALITY TEST
In conducting an econometric study, the direction of causal relationship among variables is determined according to the information obtained from the theory. In this study, Granger Causality test was used in order to test the hypotheses regarding the presence and the direction of the causality between assets quality and profitability of deposit money banks.

DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS
Table OLS Result Output between Assets Quality and Return on Assets

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.097605	3.563955	1.710909	0.0986
NPL	0.015289	0.036380	0.420267	0.6776
LAT	-0.100918	0.045771	-2.204820	0.0362
LAS	0.009531	0.083706	0.113865	0.9102
R-squared	0.195479	Mean dependent var		2.116129
Adjusted R-squared	0.106087	S.D. dependent var		3.204590
S.E. of regression	3.029842	Akaike info criterion		5.174812
Sum squared resid	247.8585	Schwarz criterion		5.359843
Log likelihood	-76.20959	F-statistic		12.18776
Durbin-Watson stat	1.939832	Prob(F-statistic)		0.000693

Source: E view 9.0 Output

The objective of this study is to investigate the effects of asset quality on deposit money bank performance in Nigeria (measure by ROA). The regression model explains our hypothesis and coefficient of deformation (R^2) of 0.1955 and adjusted (R^2) OF 0.106. This indicated that the regression has low explanatory power. However, the values of R^2 and adjusted R^2 show that 20 percent of the variations in the criterion variable (Return on Assets) is attributable to the predictor variable selected by the model and involve ratio of non-performing loan to total loan (NPL), ratio of liquid assets to total assets (LAT) and ratio of liquid assets to short term liabilities (LAS). Though the R^2 and adjusted R^2 is low but it is significant judging from the significant F. statistics, which is equally considerable the implication is that the regression model for this study is well specified and does not suffer any mis-specification problem. Further, the result from the model can be relied upon in making useful inference with respect to return on assets (ROA). The Durbin Watson test is use for testing presence of auto-correlation which has a value of 1.94. The DW table shows the upper and lower value as 1.31 and 1.68 respectively. This shows that there is no presence of auto-correlation among the variable since the Durbin Watson computed does not fall within the DW tabulated. Under table 4.8 the results will reject the null hypothesis since it has a residue relationship on deposit money bank performance (ROA) in Nigeria. This mean that ratio of non-performing loan to total loan are significant in explaining the performance of deposit money banks. The result shows that the ratio of liquid assets to total asset of the bank is statistically significant in their influence on Return on Assets. LAT has negative relationship with return on assets (ROA). This indicates that return on assets (ROA) and ratio of liquid assets to total assets move in opposition direction. The coefficient shows that a percentage increase of ratio of liquid asset to total assets will lead to about o.10 decrease in return on asset (ROA). The output of this could be attributed to the unprofitable/volatile deposits and reserves which do not stay long in banks vault. Deposits in the bank vaults can be erratic and vulnerable that is subject to withdrawer without notification. This result is in line with finding of Ikpefan (2013), Abata (2014); Lucky & Nwosi, (2015) and Vighneswara (2015). Finally, the ratio of liquid assets to short term liabilities has insignificant effect on Return on Assets of 5% level of significance. The result shows that there is a positive relationship between ratios of liquid assets to short term liabilities though insignificant.

Table 4.4 Stationarity Test for Assets Quality and Return on Asset

Variables	ADF stat @ 1st Difference	Critical Value @ 1%	Critical Value @ 5%	Order of Integration
ROA	-5.397653	-3.6852	-2.9705	I(1)
NPL	-5.573627	-3.6852	-2.9705	I(1)
LAT	-6.011578	-3.6852	-2.9705	I(1)

LAS	-4.599397	-3.6852	-2.9705	I(1)

Source: E-view 9.0 Output

The study conducted stationarity test using the Augmented Dickey Fuller unit root test. The results are summarized on table 4.6 for each of the variables under study. Comparing the critical value at both 1% and 5% with the ADF statistics, the result indicates that all the variables are stationary at first differencing. Hence, the variables are all integrated serious of order 1(I). this implies that the absolute values of the ADF test statistics are all greater than the critical values at 5% level of significance. Having stationarized the series, the data can now be subjected to a test to ascertain whether these series are co-integrated or not by employing the Johansen Co-integration procedure to estimate the long run equilibrium relationship between the predictor and criterion variables.

4.5 Econometric Analysis and Hypotheses Testing

Table 4.7 Johansen Co-integration Test Output between Assets Quality and Return on Assets

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.626201	48.37381	47.21	54.46	None *
0.369605	19.83675	29.68	35.65	At most 1
0.198525	6.455884	15.41	20.04	At most 2
0.001315	0.038146	3.76	6.65	At most 3

Source: E-view 9.0 Output
*(**) denotes rejection of the hypothesis at 5%(1%) significance level L.R. test indicates 1 cointegrating equation(s) at 5% significance level

Since the data are of order 1(I), we now apply the Johansen co-integration techniques to ascertain the existence of long-run co-integrating relationship. The co-integration test is based on the likelihood ratio and the critical value. The result is presented in table 4.7 above and from table 4.7 it can be seen that the observed likelihood ratio of 48.374 is greater than the critical value of 47.21 at 5% level of significance. Therefore from the table it is clear that the test indicate at most 1 co-integrating equation. This result means that there is a long run equilibrium relationship between return on assets (ROA) and bank asset quality indicators in Nigeria. The finding of this study is in line with the work of Lucky and Nwosi (2015) and Vighneswara (2015) and in contrary with this finding of Khalied (2012) and Li & Chiu (2004) who find no evidence of co-integration between bank performance asset qualities.

Table 4.6 Granger Causality Test Output Assets Quality and Return on Assets

Null Hypothesis:	Obs	F-Statistic	Probability
NPL does not Granger Cause ROA	29	1.77927	0.19031
ROA does not Granger Cause NPL		0.11710	0.89000
LAT does not Granger Cause ROA	29	2.60432	0.09471
ROA does not Granger Cause LAT		3.59150	0.04320
LAS does not Granger Cause ROA	29	1.04864	0.36593
ROA does not Granger Cause LAS		3.35894	0.05174
LAT does not Granger Cause NPL	29	0.92660	0.40960
NPL does not Granger Cause LAT		0.62885	0.54176
LAS does not Granger Cause NPL	29	1.99824	0.15750
NPL does not Granger Cause LAS		1.25612	0.30281
LAS does not Granger Cause LAT	29	0.02567	0.97468
LAT does not Granger Cause LAS		3.31366	0.05361

Source: E view 9.0 Output

The result of the Pairwise granger causality test conducted with a maximum log of 2 is presented in table 4.9 below from result; the null hypothesis is rejected if the probability of F-statistics given in the test result is less than 0.05. From table 4.9 the result shows that at 5% level of significance. Ratio of non-performing loan to total loan (NPL) does not granger cause bank performance (ROA) just as ROA does not granger NPL. This implies that the level of NPL in the banking sector cannot influence return on assets of banking institutions in Nigeria vice versa. This is in line with the work of Lucky and Nwosi (2015). Also the result as shown in table 4.5 reveal that there is causality having from ether LAT to ROA or ROA to LAT at 2 years lagged periods. This evidence is confirmed by the probability value at both instances were less than 0.05 and 0.10 measured at 5% and 10% Significance level. This suggests that an increase in the ratio of liquid assets to total asset (LAT) will raise the performance of bank in Nigeria and vice versa. On the other hand, increase in ROA of Nigeria banks will in turn translate into a rise in liquid assets of Nigeria banks. Also, increased performance of banks can boost liquidity of Nigeria banks which in turn increase the credit creation ability of the Nigerian banks. Finally, the results reveal the case of a unidirectional causality flowing from ratio on assets (ROA) to liquids asset to short term liabilities of Nigeria. The implication of this is that an increase in ratio on assets (ROA) can boost banks liquidity to meet short term obligation as they come due. Our finding collaborate the findings (Kpefan 2013), the study cannot accept the null hypothesis of no causal affect between asset quality and DMB performance in Nigeria. By inference therefore, the results shows that asset quality granger cause and influence bank performance in Nigeria.

Table 4.7 Serial Correlation Test for Asset Quality and Return on Asset

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.649016	Probability	0.531141
Obs*R-squared	1.530113	Probability	0.465308

Source: E-view 9.0 Output

The results of the Breusch-Godfrey Serial Correlation LM Test as presented in table 4.3 above indicate that there is problem of serial correlation among series. This evidence is confirmed by their respective F-statistic and observed* R^2 statistic together with the probabilities values reported to be well above the conventional level of significance. Therefore the hypothesis of no serial correlation will have to be accepted.

Table 4.8 Heteroskedasticity Test for Asset Quality and Return on Asset

White Heteroskedasticity Test:			
F-statistic	0.971848	Probability	0.465188
Obs*R-squared	6.059577	Probability	0.416549

Source: E-view 9.0 Output

The Heteroskedasticity Test results are presented in table 4.9, 4.10 and 4.11 above. From the tables above it shows that the presences of homoscedasticity among the variables are overcome. This is confirmed by their respective F-statistic and observed* R^2 statistics together with the probabilities values reported to be well above the conventional probabilities value.

Table 4.9 Stability Test for Asset Quality and Return on Asset

Ramsey RESET Test:			
F-statistic	0.121277	Probability	0.730458
Log likelihood ratio	0.144263	Probability	0.704079

Source: E-view 9.0 Output

Similarly, the Ramsey RESET functional form test, reported on table 4.5 above revealed that model was properly specified and is in the appropriate form. The f-statistic and observed* R-squared statistics revealed probabilities of 0.730 and 0.704 respectively and these are well above the conventional levels of acceptance. Thus we reject a null hypothesis of inappropriate functional form. We have no reason to worry about mis-specification problem.

Discussion of Finding

As earlier discussed, the study is an attempt to examine the effect of asset quality on deposit money bank performance. The result of the study discovered that in the long run there is a significant relationship between asset quality and deposit money bank performance in Nigeria. This explicitly rules out the acceptance of the null hypothesis of no evidence of co-integration between the variable of study. This submission is line with the submission of Lucky & Nwosi (2015). Following the consistency of the ordinary least square (OLS) result and notwithstanding the contentions of current theoretical thoughts, the results of regression technique is not sufficient to establish causality, this we cannot immediately conclude that asset quality or its variables (NPL, LAT and LAS)

does significantly and positively influence deposit money bank performance in Nigeria measured by return of asset (ROA). It is in this regard that the third hypothesis was postulated. As identified in third hypothesis which was formulated in the null form of no causality between asset quality and Deposit Money Bank performance is rejected in place of the alternative. This is confirmed by the probability value of the result of the study finding is in line with the findings of Lucky & Nwosi (2015). But generally, the models were discovered to be statistically significant and asset quality of banks were discovered to account for variation in deposit money banks performance in Nigeria which goes in line with findings from scholars like Abata (2014); Vighneswara (2015) and Lucky & Nwosi (2015).

CONCLUSION AND RECOMMENDATIONS

Conclusion
Conclusively, it can be deduced that there is a significant relationship existing between asset quality and DMBs performance in Nigeria. This agrees with the fact that good assets quality is relevant to the deposit money banks (DMBs) performance. Furthermore, maintaining sound assets quality position is critical to the long term performance, survival and sustainability of DMBs in Nigeria.

Recommendations
The following recommendations are made in this study:

i   Managers of banks should encourage activities that will promote DMBs liquidity which will be used to meet customers run on the banks and other short term obligation.

ii   Managers of banks should continue practice prudent credit risk management to safeguard assets and protect interests of the investors.

iii   Banks should from time to time review their credit pokey to further reduce the incidence of bad loans.

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