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Collision of NPLs on the Financial Performance of Commercial Banks: A Case Study of Ethiopia

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Abstract
Credit risk in banking relates to the possibility that loans will not be paid or that investments will deteriorate in quality or go in to default with resultant loss to the bank. This is the most obvious and most important risk to the banking industry in terms of potential losses. Credit risk is not confined to the risk that borrowers are unable to pay; it also includes the risk of payments being delayed, which can also cause problems for the bank. In order to protect their own interest and the wealth of bank depositors, banks need to investigate and monitor the activities of the will be and existing borrowers. Adequately managing of those risks related with credit is critical for the survival and growth of any financial institution. The present case study projects the effects of Non-Performing Assets on the Financial Performance of Commercial Banks in Ethiopia.

Keywords: Commercial Banks, Effects, Ethiopia, Financial Performance, NPLs.

1. Introduction
A non-performing loan is a loan that is in default or close to being in default. Banks face different elements of risk that require to be identified measured and managed. Managing these risks is a process by which one identifies the risk, measures and quantifies the risk and develops strategies to manage the risk. The banking industry is facing different types of risks associated with its functions. But according to Van Gestel & Baesens (2009), credit risk has been the most principal and perhaps the most important risk type that has been present in finance, commerce and banks too. Credit risk has been defined from different perspectives by different researchers and organizations. Most researchers agreed with the definition given by Basel (1999) who defines it as the potential that debtor or counterparty default in satisfying contractually predetermined obligation according to the agreed up on terms. Because failure of trading partner to repay its debts in full can seriously damage the affair of the other partner, credit risk always has been the vicinity of career throughout the world (Achoo & Tenguh, 2008).
According to Zewude (2011), for banks, the issue of credit risk is of even of greater concern because of the higher level of perceived risk resulting from the loan book which is the largest asset for any commercial bank. Even though credit creation is the main income generating activity for commercial banks, it involves a huge risk to both the banks and the borrowers.

2. Statement of the Problem
Banks are exposed to risks like credit, market, operational, interest rate and liquidity risk. The appropriate management of these risks is a key issue to reduce the earnings risk of the bank, and to reduce the risk that the bank becomes insolvent and depositors cannot be refunded. Banks use deposits of their customers to generate credit for their borrowers, which in fact is a revenue generating activity for the banks themselves. This credit creation process exposes the banks to a high default risk which might lead to financial distress including bankruptcy. The banks can either choose from the proposed options or employ their own as long as it gives sound and fair results.
The importance of the credit risk management and its impact on performance has motivated researcher to pursue this study. The research assumes that if the credit risk management is sound, the performance (profit level) was satisfactory. The other way around, if the credit risk management is poor, the performance (profit level) was

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relatively lower. The central question is how significant is the impact of credit risk management on performance (profitability).

3. Objectives of the Research

- The general objective of this study was to assess the impact of NPLs on the performance of selected commercial banks in Ethiopia.
- To analyze the impact of credit risk management on the performance of the bank.
- To determine the relationship between credit risk management and performance in terms of profit for the commercial banks in Ethiopia.

4. Hypotheses of the Research

Throughout the research, the following two hypotheses were tested.

- H_1: Non-performing Loan Ratio (NPLR) has significant impact on the performance of commercial Banks in Ethiopia.
- H_2: Capital Adequacy Ratio (CAR) has significant impact on the performance of commercial Banks in Ethiopia.

5. Significance of the Research

It was show the impact of NPLs on bank performance; it was give a motivation to other researchers to conduct a research about the NPL's practices in the commercial banks and it was useful for financial institutions by providing information about NPLs.

6. Scope of the Research

In Ethiopia, there were banks which give service in number twenty one. This study was limited to a manageable of five banks in commercial banks of Ethiopia and even if there were different problems which need investigation, the aim of the study was to to assess the impact of NPLs on the performance of selected commercial banks in Ethiopia. These researches were limited on the measure of the performance of commercial banks in terms of credit risk management under the selected sample. The study was employ non-performing loan ratio/NPLR/ and capital adequacy ratio/CAR/ as the measuring instruments of credit risk management and return on asset /ROA/ as indicator of performance in terms of profit.

7. Limitations of the Research

The researcher limited this study to only five commercial banks; the study was limited to 10 years of bank data and the study was based on secondary data only.

The researcher decided to limit this study to Commercial Banks of Ethiopia namely, Awash international bank, Bank of Abyssinia, Nib International Bank, Dashen Bank and Commercial Bank of Ethiopia. These banks have been selected with criteria taken as the five banks from other banks expected to have more than ten years of experience on the lending activities.

8. Sampling Design

The researchers selected five major commercial banks in Ethiopia and collected the necessary data from each bank. Those data was collected from National Bank of Ethiopia annual report from 2007 to 2016, and used for regression purpose. The reason why the researcher purposively selects five banks is, to have more observations. For those banks with 10-year life span is selected. Therefore, there are 50 observations in the regression analysis.

9. Source of Data and Data Collection Instrument

The main source of data for the study was found from the audited balance sheet and income statement of five purposively selected banks. From those banks, 10 consecutive years of balance sheet and income statement report were used for the study. In our country it's a must for banks to submit its annual report to the NBE not only that they are supposed to submit their off balance sheet too. So the researcher's easily gets annual reports of all selected banks from the NBE.

10. Data Analyzing Instrument

The data collected from the annual reports of the banks were analyzed using multiple regression analysis: the relation of one dependent variable to multiple independent variables. The regression output was obtained using Statistical Package for Social Sciences (SPSS 20 version).

11. Model Specification

In this study, multiple regression models with two independent variables were used. To measure for financial performance i.e. ROA (Net Income/Total asset): for credit risk management are NPLR (Non-performing Loans/Total Loans) and CAR] respectively.

12. Inferential Analysis of Commercial Banks in Ethiopia

12.1 Diagnostic Tests

Here the researcher used regression command for handling the regression. This is followed by the output of these SPSS commands.

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Table 1

Variables Entered/Removedb			
Model	Variables Entered	Variables Removed	Method
1	CAR, NPLR[a]	.	Enter
a. All requested variables entered.			
b. Dependent Variable: ROA			

Source: SPSS regression out put

Table one shows the variables entered or variables removed from the study at any point of time from the beginning till the end of the work. As it is explained the variables entered in column two are independent variables of the study i.e., capital adequacy ratio and non-performing loan ratio. Since there was no variable removed from the study, variable removed column is free. The last column shows the method that was used by the researcher, enter method was used to remove or enter the variables. All variables are entered on the above table. The dependent variable which is return on asset explained in the bottom of the table.

Table 2: Linearity of the Variables

Model Summary[b]									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df 1	df 2	Sig. F Change
1	.422[a]	.178	.143	.00571	.178	5.080	2	47	.010
a. Predictors: (Constant), CAR, NPLR									
b. Dependent Variable: ROA									

Source: SPSS regression out put

Table 2; demonstrates about large R, which shows the multiple correlation coefficients and the correlation between the observed and predicted values of the dependent variables. And the value of R for models produced by the regression procedure range from 0 to 1. The larger the value of R display that there is strong relationship among observed and predicted value. In our case R is 0.422.

R square tells us, how much of variance in the dependent variable is explained by our independent variable. So, in our case we were known how much NPLR and CAR explained by ROA. As of R and the value of R square ranges between 0 and 1, beside to that small value indicates that the model does not fit the data well. As the table indicates, the independent variable explained the dependent variable by 17.8%. This means that our model using two predicted variables (NPLR & CAR) explain about 17.8% variance of our dependent variable (ROA). Right next to R square we get adjusted R square. If we had small sample size the R square value in the sample tend to be a little over estimated and little optimistic over estimation of what probably really happening in the population. So, Adjusted R square corrects this value to provide a better estimation of what actually happening in the population. In our case Adjusted R square is .143. Standard error of the estimate this is basically gives an idea of how much our prediction might be off. If the number is large the more variability it indicates from the table, we have Standard error of the estimate (0.006) which is very small and good.

R square is significant at 5 % level of significance as the SE <.05.

Table 3: ANOVA Table

ANOVA[b]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.000	2	.000	5.080	.010[a]
	Residual	.002	47	.000		
	Total	.002	49			
a. Predictors: (Constant), CAR, NPLR						
b. Dependent Variable: ROA						

Source: SPSS Regression Out put

ANOVA, table summarizes the output of the analysis of variance. In regression row, the output for regression displays information about the variation accounted for by the existing model. Residual displays information about the variation that is not accounted for by the model. And total in the table shows the sum of regression and residual. Mean square is the sum of squares divided by the degrees of freedom. And F statistics is the regression mean square

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divided by the residual mean square. If the significance value of the F statistics is small, then the independent variable does a good job in explaining the variation in the dependent variables.

Table 4: Collinearity Diagnostics Test Table

Collinearity Diagnostics[a]						
Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	NPLR	CAR
1	1	2.561	1.000	.01	.06	.01
	2	.387	2.574	.03	.92	.05
	3	.052	7.005	.96	.02	.94
a. Dependent Variable: ROA						

Source: SPSS Regression Out put

Table 5 is a table which displays statistics that help to determine whether there are any problems with collinearity or not. Collinearity (multicollinearity) is the undesirable situation where the correlations among the independent variables are strong.

Eigenvalues proved an indication of how many different dimensions are there among the independent variables. When several Eigen values are close to zero, the variables are highly interring correlated and small changes in the data values may lead to large changes in the estimates of the coefficients.

Condition index are the square roots of the ratios of the largest eigenvalue to each successive eigenvalue. A condition index greater than 15 indicates a possible problem and an index greater than 30 suggests a serious problem with collinearity (SPSS output).

Even if eigenvalues are used for checking the existence of collinearity, the best way is conditional index. So in this research case, since conditional index value scored around 1, 2 and 7, from this ground the researcher can say that there is no multicollinearity among independent variables.

Table 5 Residuals Statistics

Residuals Statistics[a]					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.0186	.0331	.0280	.00260	50
Residual	-.01952	.01035	.00000	.00559	50
Std. Predicted Value	-3.609	1.973	.000	1.000	50
Std. Residual	-3.416	1.812	.000	.979	50
a. Dependent Variable: ROA					

Source: SPSS Residual Out put

Table 6, tells about the residual and predicted value. For each case, the predicted value is the value predicted by the regression model and for each case; the residual is the difference between the observed value of the dependent variable and the value predicted by the model. Residuals are estimate of the true errors in the model, if the model is appropriate for the data, the residuals should follow a normal distribution. Standardized predicted values are predicted values standardize to have mean 0 and standard deviation of 1. In short standardize residuals are ordinary residuals divided by the sample standard deviation of the residual and have mean of 0 and standard deviation of 1.

12.2 Test of Normality of Residuals

One of the assumptions of linear regression analysis is that the residual is normally distributed, at the mean of zero and standard deviation of one. All of the results from the examiner command suggest that the residual or the error terms are normally distributed. The skewness and kurtosis are near to 0. As one can observe from the histogram and p-p plot it looks normal. Based on these results, the residuals from this regression appear to conform to the assumption of being normally distributed.

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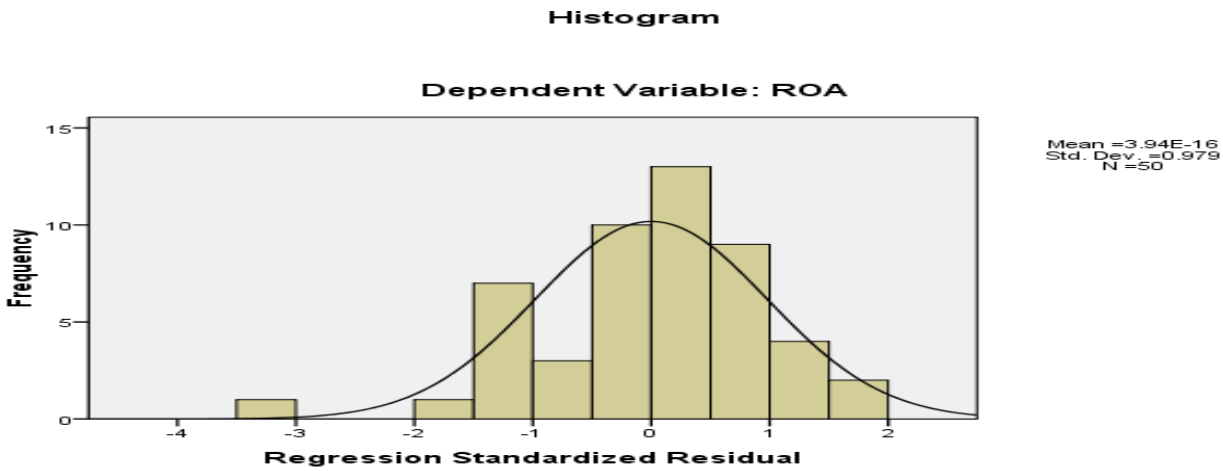
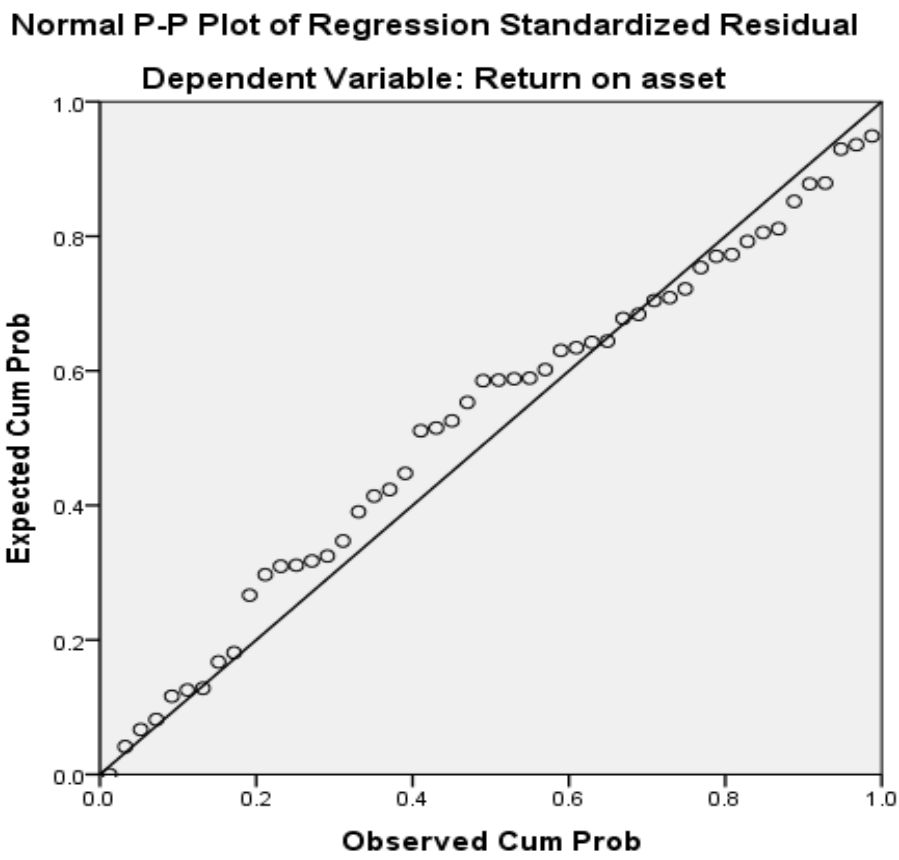
Figure: 1. Histogram (Test of Normality)



Source: SPSS regression out put

Figure: 2 Normal p-p plot of RegressiS on tandardized Residual



Source: SPSS Regression Out put

The above Figures show whether the data are normally distributed or not. The error term should be normally distributed at the mean of 0 and standard devotion 1, here in this model the mean is approximately 0 and the standard devotion is 0.979 approximately 1, so the model is normally distributed. The researcher watched from the histogram and from the p- p plot too.

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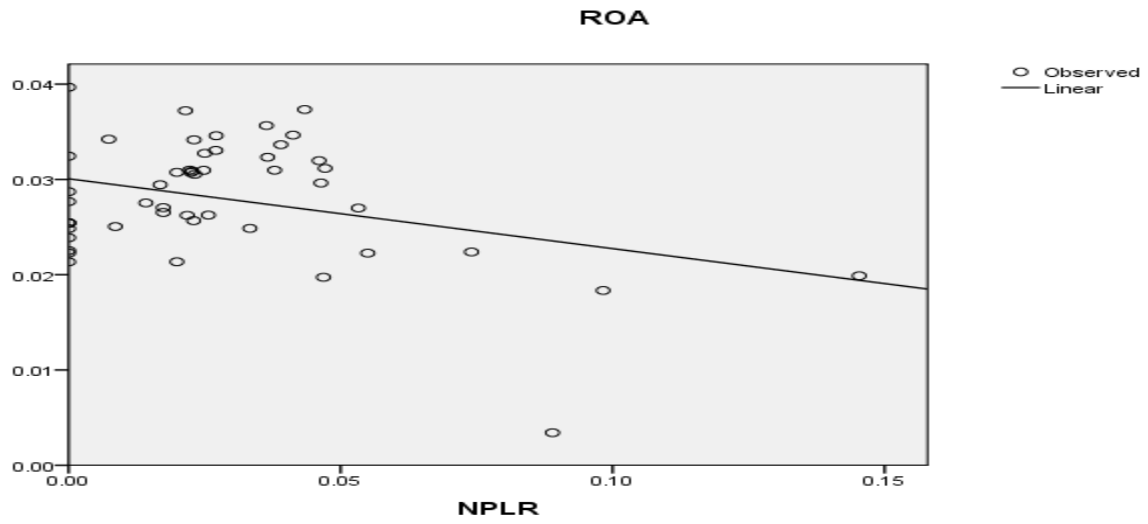
12.3 Relationships between ROA and NPLR

Figure 3: Scatter Diagram for ROA vs. NPLR



Source: SPSS Regression Out put

The scatter diagram above shows the negative relationship between the two variables hence a negative gradient. This confirms the coefficient of the NPLR of the variable in the regression equation and hence non-performing loans is good indicator of return on asset from the above results.

The points are closely clustered at one point. This may indicate the nature of performance of the bank and the level of shareholding and if the institution is public listed or private companies. The nature of relationship does not give a positive relationship to the whole banking sector in this research analysis.

12.4 Relationship between ROA and CAR

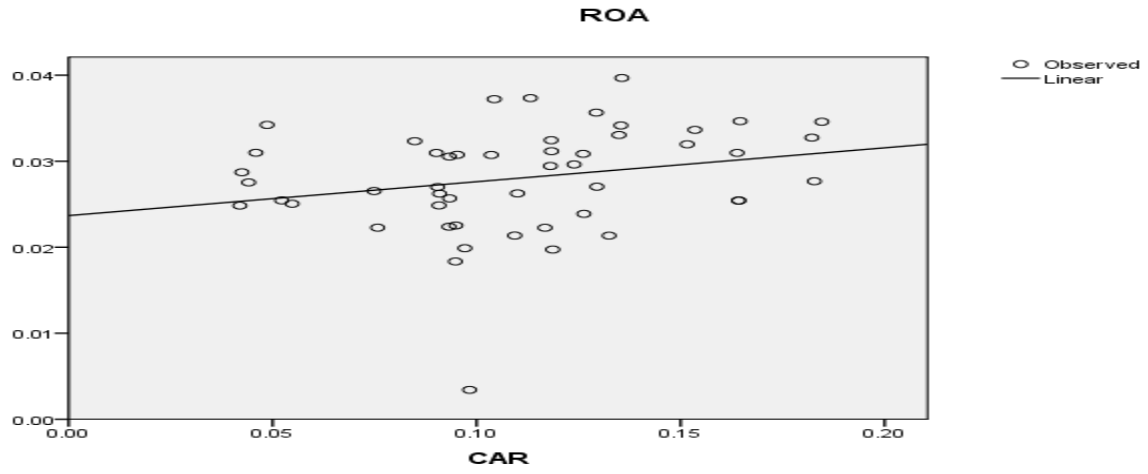


Figure 4: Scatter Diagram for ROA vs. CAR

From the scatter diagram above the points along the line of the best fit are observed to have a big dispersion in regard to the line. The Positive points make line look like horizontal reducing the gradient/slope between the two variables.

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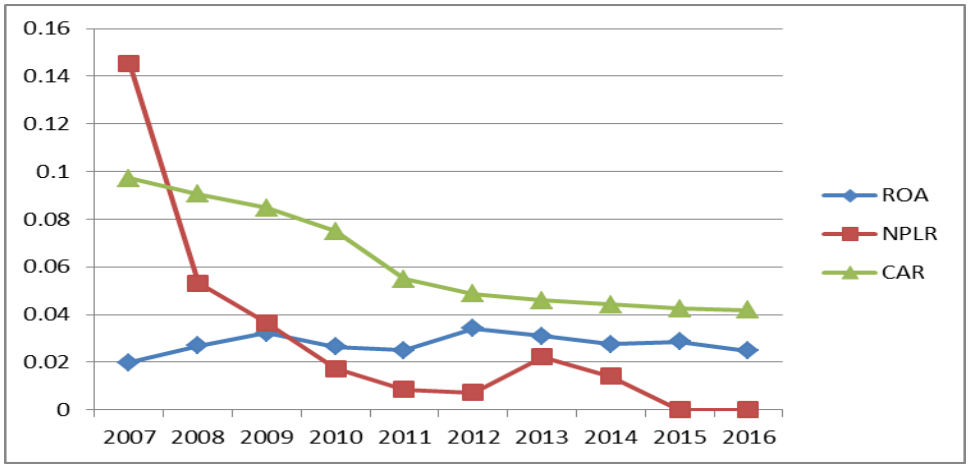
12.5 Descriptive Analysis of Commercial Banks in Ethiopia

The Relationship between Credit Risk Management and Profitability at CB of Ethiopia

Graph 5



Scatter Diagram for ROA, CAR and NPLR of Commercial Bank of Ethiopia

From the above graph it's that observed the relations between ROA, NPLR & CAR of commercial bank of Ethiopia.

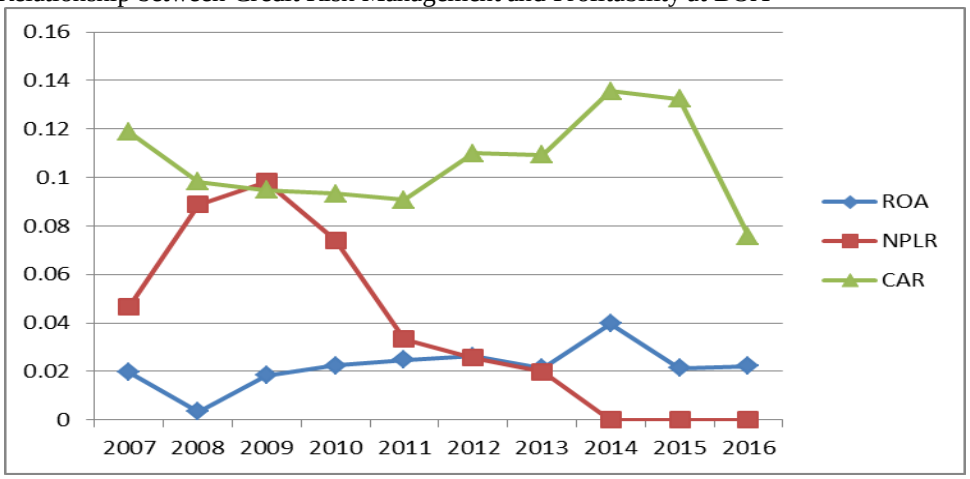
When NPLR reaches its maximum at (15), ROA reaches its minimum at (2). This means that 15% from the total loan are non-performing or default to be paid by the bank customer. So an increase trend of ROA indicates that the profitability of the company is improving. Conversely, a decreasing trend means that profitability is deteriorating. So, 2% indicates a deteriorating profitability of CB of Ethiopia.

During (2007-2008) CBE have low performance regarding credit risk management in terms of (NPLR) and from (2009-2016) dramatically decrease and ROA is above NPLR this shows that CB of Ethiopia manages its default loan properly and the profit of the bank also increase dramatically.

CAR of commercial bank of Ethiopia indicate normal trend throughout the years.

12.6 The Relationship between Credit Risk Management and Profitability at BOA

Graph 6The Relationship between Credit Risk Management and Profitability at BOA



Scatter Diagram for ROA, CAR & NPLR OF Bank of Abyssinia

From the above graph were observed the trend of ROA, NPLR & CAR for Bank of Abyssinia.

During 2008 NPLR reaches its maximum with 9.8 % this shows that from the total loan 9.8 % default to be paid by the customer.

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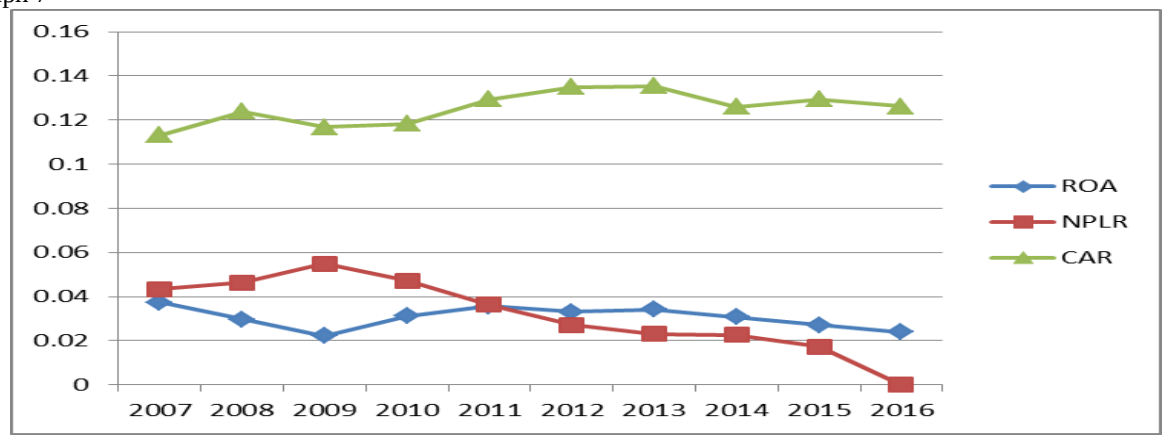
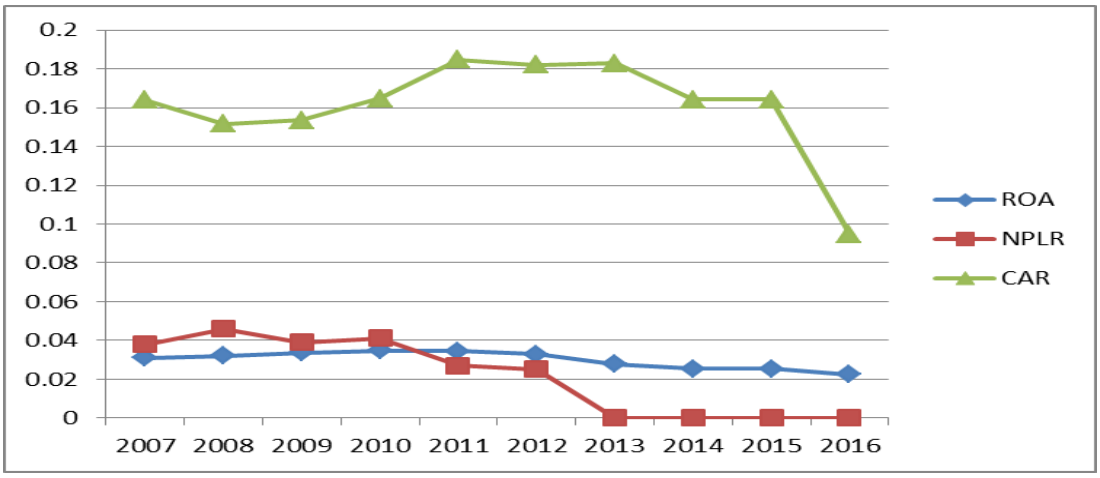
NPLR shows a zigzag trend from 2008-2013 and it has decrease initially. Finally from 2014-2016 it decreases at an increasing rate. In recent year the trend shows BOA has managed its NPLR.
From this trend were observed that when the number of NPLR reaches its maximum ROA reaches its minimum from our sample of 10 years of data.
ROA is greater than NPLR from year 2012 this shows BOA was managed its default loans properly.
CAR shows high trend which means that BOA kept high capital for risk weighted sum for bank assets.
The Relationship between Credit Risk Management and Profitability at AIB
Graph 7



Scatter Diagram for ROA, CAR &NPLR of Awash International Bank
From the above graph were observed the relations between ROA, NPLR & CAR of Awash International Bank
Like other banks, AIB have bad NPLR from (2007-2010) years but it decreases continuously from (2011-2016) as the above figure indicated.
ROA is below NPLR From (2007-2010) and above NPLR from (2011-2016) this indicates that Awash International Bank have managed its NPLR properly during years.
CAR of Awash International Bank is little to high relative from the above mentioned banks.

The Relationship between Credit Risk Management and Profitability at NIB
Graph 8



Scatter Diagram for ROA, CAR &NPLR of Nib International Bank
The above graph shows the relation between ROA, CAR & NPLR of Nib International Bank.

NIB has relatively lower NPLR when compared to that of the other banks.
From (2007-2010), NPLR is above ROA and from (2011-2016) ROA is greater than NPLR. NIB has managed its default loan properly.

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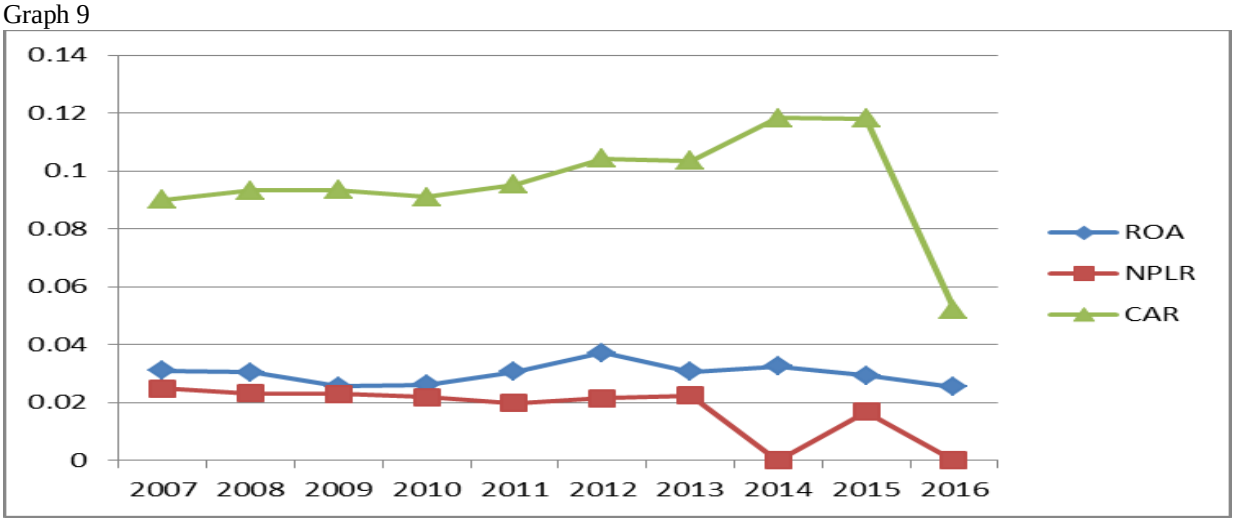
CAR of NIB are very high like other private banks
The Relationship between Credit Risk Management and Profitability at DB
Graph 9



Scatter Diagram for ROA, CAR &NPLR of Dashen Bank

The above graph shows the relation between ROA, CAR & NPLR of Dashen bank
Dashen bank NPLR is low from year (2007-2016). This shows that the bank managed loan properly. It should be a good example for other banks regarding Loan management.
CAR of Dashen is high like other private banks.

13. Findings of the Research

- This study shows that there is a significant relationship between performance (in terms of profitability) and credit risk management (in terms of loan performance and Capital adequacy). The results of the analysis states that NPLR have negative and significant effect whereas CAR have positive and relatively significant effect on ROA, with NPLR having higher significant effect on ROA in comparison to CAR. The regression as a whole has significant result; this means that NPLR is reliably predicted of ROA but CAR has relative low significant prediction.
- From the data analyzed above, the relationship of the three variables i.e. ROA, CAR, and NPLR well explains the credit risk management on the performance of selected institutions. Since banks take deposits and use the same to advance loans the costs associated with these loans e.g. insurance costs reduce the profitability margins of the bank.
- Return on asset (ROA) measures the ability of the bank management to generate income by utilizing company assets at their disposal. Therefore, increased portfolio at risk will reduce the revenue aspect and increase the cost associated as indicated by the analysis of nonperforming loans.
- The output from the regression analysis. First of all, let‘s looks the p value of the F test to see if the overall model is significant or not (from MODEL SUMMERY table 2). With the p value of 0 to the four decimal places, the model is statistically significant. The R square is 0.178 meaning that approximately 18% of the variability of ROA is accounted for by the variables in the model. The coefficient for each of the variables indicates the amount of change one could expect in ROA given a one unit change in the value of that variable, given that all other variables in the model are held constant. For example, let‘s consider the variable NPLR (Coefficients table 4**)**; the researcher would expect a decrease of -.075 in the ROA score for every one-unit increase in NPLR, by assuming that all other variables in the model are held constant.
- Here the researcher answer about the two predictors, whether they are statistically significant and if so the direction of the relationship. (From table4) The effect of NPLR (non-performing loan ratio) which is (Beta = -.075, P 0.012) is significant and its coefficient is negative indicating that the greater the non-performing loan ratio the lower the profitability of commercial banks in Ethiopia. If the NPLR is high lower profitability of banks. This result also makes sense, because both the theoretical and empirical evidences ‘support that too. The effect of capital adequacy ratio is also (CAR, Beta = 0.042) significant (p, 0.061) and as watched it is positive and p value greater than 0.05 which indicates that CAR have relatively low or in-significant effect on ROA.

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14. Conclusion and Recommendation

The purpose of this chapter is to review the whole thesis and highlight future researcher directions. The next section displays recommendation made by the researcher for all concerning issues.

Conclusion

- The main objective of this study was to assess the impact of credit risk management on the performance of selected commercial banks in Ethiopia, for the sample period of ten years i.e. 2007 to 2016.
- The study concluded that NPLR had a statistically significant effect on the level of ROA. However, the results of this multiple regression model revealed that CAR has no significant effect of on the level of ROA.
- There was no correlation among independent variables (NPLR and CAR) which means each of the independent variables explained the dependent variable separately.
- There was no collinearity (multicollinearity) among independent variables.
- Non-performing loan ratio have negative impact, on the other hand capital adequacy ratio have positive impact on profitability of selected commercial banks in Ethiopia.
- Finally, from the data analyses, non-performing loans and capital adequacy ratio have shown that there exists a relationship between credit risk management and the performance of selected banks. But CAR has relatively lower effect on measuring the performance of selected banks. An increase in NPLR increases the credit risk of banks.

Recommendation

Based on the findings and conclusions of the study the following recommendations are given.

- The bank management needs to be cautious in setting up a credit policy that will not negatively affects profitability and also they need to know how credit policy affects the operation of their banks to ensure judicious utilization of deposits and maximization of profit.
- Banks should establish credit policies and standards that confirm to regulatory requirements and the bank's overall objectives to further reduce the level of their credit risk exposure (unprotected).
- Banks are advised to provide adequate training in terms of their credit policies and standards to their employees who are working in Loan disperse department.
- This study could be further developed by including more independent variables to the regression model and increasing the sample size.
- It is better if this study is supplemented with qualitative study of credit risk management so that the findings would be more objective and informative.
- Performance indicator could be developed by adding other relevant dependent variable to grasp (understand) the whole variations in performance.
- Finally, the study suggests that a further study should be done on the impact of credit risk management on different aspects of banks' activity.

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