

The Impact of Credit Risk Management on Financial Performance of Commercial Banks –Evidence from Eritrea

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Abstract

This study focuses on the impact of credit risk management on the performance of commercial banks in Eritrea. The main indicators used in this study are Return on Assets (ROA), Non-performing Loans Ratio (NPLR), Capital Adequacy Ratio (CAR), Loan and Advances Ratio (LAR) and Loan Loss Provision Ratio (LLPR). The researches collect data from Commercial Bank of Eritrea and Housing and Commerce Bank of Eritrea from 1998 to 2015. Descriptive and panel data regression analysis are used in order to test the relationship between the four indicators and the performance of commercial banks in Eritrea. The findings show that credit risk management is inversely associated with bank performance. The nonperforming loan, and loan and advances ratios significantly and negatively affected performance of the commercial banks. The result indicates that loan and advances ratio are negative but statistically insignificant. There is a positive relationship between CAR and ROA. The significant positive relationship between loan loss provision and commercial banks performance in this study could indicate the presence of potential earning management activities by bank managers.

Keywords: Performance, Credit risk management, Commercial Banks, Eritrea

1. Introduction

In the manufacturing sector today, human capital is still essential for most factories to carry out a variety of manual operations, in spite of the rapid advancement of automation technology and robotics. Futuristic vision of “unmanned manufacturing” (Deen 1993) is forbiddingly expensive, because all its hardware components need to be computer controlled so as to freely communicate with each other; and yet, most of the outcomes are not promising (Sun & Venuvinod 2001). By and large, factories equipped with relatively simple machinery controls will require continuous attendance of human operators; for examples, textile mills, leather products, and medical appliances. With limited capital investments in production equipment, the main budget of their fixed costs lies on the workforce size (Techawiboonwong *et al.* 2006).

Over the past decades, the developments in the banking industry have led to a sophisticated approach to the management of credit risk. Credit risk for a borrower arises when they don't payback their bank liabilities (Campbell 2007). Credit risk management is an activity by which integrate credit risk identification, assessment, monitoring, and implementation, in order to mitigate the risk of non-performing loan (Brealey & Myers, 2003). Banks financial performance is a measure of how well a firm can use assets to generate over a period of time gauged by net income and cash from operation (Aktan & Bulut, 2008). The main goal of credit risk management is to maximize bank's profitability by maintaining credit risk exposures within the acceptable limit in order to provide a framework for understanding the impact of credit risk management on bank's profitability (Bhattarai, 2016).

Granting credit is one of the main sources of commercial bank's income (interest income) and a source of credit risk. Therefore, the management of the credit risk affects the profitability of the banks (Bhattarai, 2016). Credit risk includes 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, improper collateral system, government interference and inadequate supervision by the central bank (Kithinji, 2010). An increase in bank credit risk gradually leads to liquidity and solvency problems. Therefore, credit risk is an internal determinant of bank performance. The higher the exposure of a bank to credit risk, the higher the tendency of the bank to experience financial crisis and vice-versa (Funso, Kolade, & Ojo, 2012).

For the survival and profitability of commercial banks, credit risk management framework is crucial. According to (Brownbridge, 1998), effective quantitative models make it possible to numerically establish the factors that are important in explaining default risk, improving the pricing of default risk, screening out bad loan applicants and calculating any reserve needed to meet expected future loan losses. Loan and advances provided to borrowers may be at the risk of default, whereas commercial banks extend the credit on the understanding that borrowers will repay their loans (principal and interest). Some borrowers usually default, and as a result, the bank's income decreases due to the need to increase loan loss provisions for such loans (Bhattarai, 2016). Where commercial banks do not have an indication of what proportion of their borrowers will default, earnings will vary thus exposing the banks to an additional risk of variability of their profits (Onyiriuba, 2009). Effective management of credit risk can enhance banks “goodwill and depositors” confidence. Thus, good credit risk

policy is an essential condition for banks' performance and capital adequacy protection.

Due to the increasing in non-performing loans, commercial banks are exposed to high risk loans. (Basel, 1999) emphasized on credit risk management practices. Banks comply with Basel II to ensure credit risk has been taken and this ultimately improves bank performance. The indicators to measure the credit risk management are: non-performing loans ratio (NPLR), capital adequacy ratio (CAR), loan and advances ratio and loan loss provision ratio. These are the main indicators used to assess the soundness of the banking system and influence banks' profitability (Bhawani & Bhanumurthy, 2012).

Eritrean banking sector can be characterized as small, state-owned, undeveloped and providing rudimentary banking and other financial services to the economy. It has only two commercial banks, namely Commercial Bank of Eritrea (CBE) and Housing and Commerce Bank of Eritrea (HCBE) (Tsegay, 1999). Their income depends heavily on lending activities to individuals and businesses locally, so credit growth is a core for their sustainability and expansion. Eritrean Commercial banks'; and their risk management involves borrowers' risk, businesses risk and lacks the opportunity to check the creditworthiness of the borrower from secondary market.

The aim of this paper is to assess the impact of credit risk on the performance of Eritrean Commercial banks over a period of eighteen years (1998-2015). So far, as the researchers' knowledge is concerned, there has been no significant research made related to this topic. More specifically, the study aims to addresses how credit risk affects the banks' profitability. The findings would guide the policy measures to the various stakeholders on how to tackle the effect of credit risk in order to enhance the quality of banks' risk assets. Based on the objectives, the present study seeks to test the following hypothesis:

H1: There is a negative and statistically significant relationship between non-performing loan ratio and bank's performance.

H2: There is a positive and statistically significant relationship between capital adequacy ratio and bank's performance

H3: There is a negative and statistically significant relationship between loan and advances ratio and bank's performance.

H4: There is a positive and statistically significant relationship between loan loss provision ratio and bank's performance.

2. Literature review

Credit risk management principles are used for creating value and addressing uncertainty, based on the available information. They also include the five Cs (character, capability, credibility, collateral and conditions) to assess loan applicants. Return on asset and return on equity are used to ascertain profitability of commercial banks. Non-performing loan ratio was linearly regressed related to the dependent variable (ROE) and found negative and significant relationship (Aduda & Gitonga, 2011). (Otieno & Nyagol, 2016); indicated that the role of relationship between credit risk management and financial performance in Kenyan microfinance banks and found loan loss provision coverage ratio (LLCR) is negative and significantly related to performance measured by ROA and ROE. However, profitability of commercial banks in Kenya is not influenced by the amount of credit and non-performing loan. Therefore commercial banks should to concentrate on other factors to increase their performance (Kithinji, 2010). (Kibor, Ngahu, & Kwasira, 2015) examined the impact of credit risk on performance of commercial banks in nakuru town Kenya. They conclude that effective lending policies (collateral, competent personnel), determinant of borrowers' credit worthiness and credit standards played significant role in management of credit risk and influence loan performance of bank.

(Flamini, McDonald, & Schumacher, 2009) used a dynamic panel data model to study the performance of 389 banks in 41 Sub-Saharan Africa (SSA) countries, making a total of 1,924 observations. They found, apart from credit risk, higher returns on assets are associated with larger bank size, activity diversification, and private ownership. The study indicated that bank returns are also affected by macroeconomic variables. They concluded that high bank profitability can reduce financial intermediation if the returns imply that interest rates on loans for the same maturity are higher in other parts of the world. Credit risk can be lowered through the increase of credit information sharing, by boosting credit expansion and lower net interest margins.

(Kayode, Obamuyi, Owoputi, & Adeyefa, 2015) investigated the impact of credit risk on banks' performance in Nigeria. A panel estimation of six banks from 2000 to 2013 time period were selected and the data was analyzed using dynamic panel model. Their findings show that credit risk is negatively and significantly related to profitability. The result implies that banks' increased exposure to credit risk reduces profits. To maximize profits, they suggested that banks should adopt an aggressive deposit and develop a reliable credit risk management strategy. On contrary, assessing the impact of credit risk on bank profitability in Nigeria, (Kurawa & Garba, 2014) and (Alshatti, 2015) used Non-performing Loans /Total Loan and Total Operating Cost /Total Amount of Loans as independent variables and ROA as dependent variable. They found that those independent variables have strong positive relationship with the dependent variable ROA. These two independent variables are influenced by loan losses and operating expenses.

(Kaaya & Pastory, 2013) carried out a study on the impact of credit risk on the financial performance of banks in Tanzania measured by return on asset. Sound management practices and corporate governance reduce credit risk. Using regression model, they found out negative correlation between credit risk and banks' performance. Banks need to maintain substantial amount of capital reserve to absorb credit risk in the event of failure. Moreover, banking lending criteria, portfolio grading and credit mitigation techniques reduce chance of default.

(Bhattarai, 2016) examined the impact of credit risk on the performance of commercial banks in Nepalese. Data from financial report of 14 commercial banks from 2010 to 2015 was used and regression mode was employed for the estimation of the model. Return on asset was used as indicator of performance and capital adequacy ratio; while non-performing loan ratio, cost per loan assets and cash reserve ratio were used as an indicators for credit risk. The study revealed that Nepalese commercial banks have poor credit risk management. This is supported by the insignificant result of 'capital adequacy ratio' and the negative coefficient of 'non-performing loan ratio'. The insignificant result of 'capital adequacy ratio' indicates that capital adequacy ratio could not be regarded as the influencing variable for bank performance. The study concluded that 'non-performing loan ratio' has negative effect on bank performance whereas 'cost per loan assets' has positive effect on bank performance. (Shrestha, 2017) assessed the impact of credit risk on performance in Nepal, and the result showed that capital adequacy ratio, cost per loan assets and assets growth ratio are positively related with return on assets and return on equity. It indicates that higher capital adequacy ratio could result to higher return on assets and return on equity.

(Hosna, Manzura, & Juanjuan, 2009) conducted a research on impact of credit risk management on profitability of commercial banks in Sweden, and concluded profitability is fairly affected by credit risk management. There is negative and significant relationship between NPLR and profitability. CAR has a positive way toward profitability.

(Boahene, Dasah, & Agyei, 2012) assessed the impact of credit risk on the profitability of selected Ghana commercial banks. A panel data covering the five-year period (2005-2009) was analyzed within the fixed effects framework. Return on equity was used as measure of bank performance and the result showed that credit risk indicators have positive and significant relationship with bank performance. Commercial banks in Ghana benefits from high default risk due to interest and other fees charged to lenders. They recommended that banks should reduce lending rates and commission charges, and encourage borrowers to pay their debt on time. Credit risk management plays a significant and dynamic role on the rural commercial banks in Ghana (Afriyie & Akotey, 2013). They further indicated that despite poor credit risk management practices and hence high levels of the nonperforming loans in their loans portfolios, rural banks profitability increasing from time to time. The losses are transferred to borrowers in the form of large interest rate margin and commission charges. But charging high interest rate is a bottleneck to small, medium and rural farmers from accessing loans. The study also revealed that rural commercial banks with higher capital adequacy ratios can better advance more loans and supports new directive of the central bank of Ghana for the re-capitalization of rural and community banks.

3. Research Methodology

This study empirically examined the quantitative effect of credit risk management on the performance of commercial banks in Eritrea over the period of 18 years (1998-2015) on quarterly basis. Audited financial data was gathered from the archive of Commercial Bank of Eritrea (CBE) and Housing and Commerce Bank of Eritrea (HCBE).

The panel data of the banks were used to examine the relationship between credit risk and performance. The measures of bank performance may be varied and the choice of the specific performance measure depends on the objective of the study. In theoretical aspects, the performance measures could be return on asset (ROA), which is the ratio of net income after tax to assets and return on equity (ROE), which is the ratio of net income after tax to equity. ROA shows the ability of banks management to generate profit from the banks' assets and reflect how well bank's real investments resources to generate profits (Naceur, 2003). On the other hand, ROE, indicate the return to shareholders on their equity. Banks with high equity and low leverage in the capital structure report high ROA, but low ROE (Kayode et al., 2015). However ROE ignores distortions that are introduced by differences in financial leverage, and Return on assets (ROA) is a comprehensive measure of overall bank performance from an accounting perspective (IMF, 2002). For the purpose of the study, ROA is used to measure Eritrean banks performance. It shows the effectiveness of management in the utilization of the assets of commercial banks.

In modelling the influence of credit risk, nonperforming loan ratio (NPLR), capital adequacy ratio (CAR), loan and advances ratio (LAR) and loan loss provision ratio (LLPR) are used. Non-performing loans ratio (NPLR) reflects the bank's credit quality and is considered as an indicator of credit risk management. NPLR indicates how banks manage their credit risk (Hosna et al., 2009). (Bhattarai, 2016) asserted that non-performing loan ratio (NPLR) is the major indicator of commercial banks' credit risk. He found that NPLR, which measures

the extent of credit default risk sustained by the banks, shows a statistically significant negative effect on profitability measured by ROA. (Jha & Hui, 2012) also found negative association between NPL ratio and ROA, but the coefficient is statistically insignificant.

Capital adequacy is the amount of capital hold as required by financial regulator, to guarantee the level of capital that banks have to sustain operating losses while honoring withdrawals. It is a measure of the amount of bank's capital expressed as a percentage of its risk weighted exposure. Theoretically, banks with good capital adequacy ratio have a good profitability. Since higher capital reduces banks' risk and creates a buffer against losses, it makes funding with non-insured debt and less information sensitive (Admati, DeMarzo, Hellwig, & Pfleiderer, 2013). Thus, capital adequacy can enhance bank performance. (Kurawa & Garba, 2014) found significant positive relationship between capital adequacy variable and ROA of banks. Simultaneously, (Jha & Hui, 2012) found negative association between capital adequacy ratio and financial performance of the banks while the coefficient was statistically significant. According to (Alshatti, 2015) no effect of the capital adequacy ratio on the financial performance of banks.

Loan and advances ratio (LAR) is a ratio that indicates the ability of banks to withstand deposit withdrawals and willingness of banks to meet loan demand by reducing their cash assets. When the banks are more liquid, they can reduce risk of insolvency (Basel, 1999). Bank depositors are protected against unexpected loss through capital adequacy reserve and protected against anticipated loss through loan loss provision reserve. According to (Basel, 1988), banks can include LLP under their capital. The basic assumption behind LLP is that bank managers reflect their belief toward the bank's asset quality. When the amount of Loan Loss Provision increases, the quality of the assets will decrease and vice versa.

The Model

The empirical model employed in the study is given as:

$$Y = \beta_0 + \beta X_{it} + \epsilon_{it} \dots\dots\dots (1)$$

Where: Y is the dependent variable; β_0 is constant; β is the coefficient of independent (explanatory) variables; X_{it} is the vector of independent variables; and ϵ_{it} is the error term (assumed to have zero mean and independent across the time period). By adopting the prescribed econometric model estimated with the following equation:

$$ROA = F(\beta_0 + \beta_1 NPLR + \beta_2 CAR + \beta_3 LAR + \beta_4 LLPR + \epsilon_{it}) \dots\dots\dots (2)$$

Particularly to this study, the impact of credit risk on the performance of the commercial banks, a pooled data regression model and SPSS 20 software was used. The panel data model becomes:

$$ROA_{it} = \beta_0 + \beta_1 NPLR_{it} + \beta_2 CAR_{it} + \beta_3 LAR_{it} + \beta_4 LLPR_{it} + \epsilon_{it} \dots\dots\dots (3)$$

Where:

- ROA_{it} = Return on assets of bank i in year t
- NPLR_{it} = Non-performing loan ratio of ith bank in year t
- CAR_{it} = Capital adequacy ratio of ith bank in year t
- LAR_{it} = Loan and advances ratio of ith bank in year t
- LLPR_{it} = Loan loss provision ratio of ith bank in year t

The econometric analysis of the model is done as follows. First, the researchers' carried out the statistical description of the variables. Secondly, they examined the panel data regression analysis to explore the relationship between credit risk management and profitability of commercial banks in Eritrea.

4. Descriptive Statistics

To measure performance, return on asset (ROA) was employed in the study and the result in Table 1 showed average 9.5 percent return on the asset with a 2.37 percent standard deviation. According to (Flamini et al., 2009), a 2 percent rate of return on asset obtained in their study of banks in sub-Saharan African countries was viewed as higher than that of the ROA of banks in other parts of the world. Hence, it can be argued that Eritrean commercial banks had been efficient enough to generate a higher rate of return out of their asset. This indicates that there is high profitability of the banks. The researchers need to identify whether the source of their profitability attributes to real productivity and effectiveness or just aggressive risk-taking behavior so as to maintain it in the future. Because the return largely attributes to a lack of competition that the banks have been sheltered from foreign-owned banks; they will face challenging future when Eritrea's accession to world trade organization is finalized or the banking sector becomes liberalized at some event.

The average NPLR in the commercial banks for the last 18 years was 4.95% with standard deviations of 2.87%. The NPLR of the bank is high when compared to world average (2-3%). The result, in general, implies that the accumulation of non-performing loan which was claimed as the critical problem of the banking sector from 1990's to early 2000's (25%) and a sharp decline in recent years. Banks are required to have adequate capital to avoid future unexpected losses incurred through NPL. CAR has a minimum value of 13.7 percent and a maximum of 36.01 percent; an average (mean) of 17.90 percent with a standard deviation of 9.21 percent. The average amount of CAR is higher than the minimum capital requirement of the BASEL and National Bank of Eritrea (15%) showing that the banks have the ability to bear loss results from a loan default. As per the

descriptive statistics in Table 1, the average LAR was 59.5 percent (with S.dev of 23.10 percent). The minimum and maximum values were 48 percent and 72.4 percent respectively, suggesting that the bank does not efficiently use the depositor's money in credit activities.

The loan loss provision ratio (LLPR) shows the default risk that the bank expects to sustain from the lending business. As shown in Table 1, commercial banks of Eritrea had an average of 4.80 percent loan loss reserve with a standard deviation of 3.79% percent. The minimum is 1.8302 percent and with a maximum of 12.36 Percent. The required amount of LLPR determined by Bank of Eritrea is Pass (General Provision) 2%, Substandard 20%, Doubtful 50% and loss 100%. Thus, the mean value of 4.8% falls under substandard.

Table 1 Descriptive statistics of the study variables

Variable	Observations	Mean	Std. dev	Min	Max
ROA	144	0.095	0.0237	0.0492	0.1675
NPLR	144	0.0495	0.0287	0.0086	0.250
CAR	144	0.1790	0.0921	0.137	0.3601
LAR	144	0.595	0.2310	0.48	0.724
LLPR	144	0.048	0.0379	0.0183	0.1236

Source: Authors' Computation

5. Pearson correlations analysis of variances

In this study, the researchers computed Pearson correlation analysis between the dependent variable and independent variables to check the presence of multicollinearity problems. As presented in Table 2 all the correlations coefficients among the variables are less than 0.5. Therefore there is no presence of multicollinearity among the independent variables.

Table 2: Pearson correlations analysis of variables

Variables	Return on assets	Non-performing loan ratio	Capital adequacy ratio	Loan and advances ratio	Loan loss provision ratio
Return on assets	1				
Non-performing loan ratio	-.056	1			
Capital adequacy ratio	-.192	.243*	1		
Loan and advances ratio	.32**	.478**	-.024	1	
Loan loss provision ratio	.390**	-.197	-.429**	.351*	1

* Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

6. Results of regression analysis

To study the effect of credit risk measuring variables (NPLR, LLPR, CAR, and LAR) on the profitability, the researchers used one model (ROA as a dependent variable). R² of the model is 56.8% indicating that the independent variables in the model explained 56.8% of the variable ROA to measure the performance. Nonperforming loan and loan and advances ratios were negatively affected to the performance of commercial banks. This result is similar to the findings of (Bhattarai, 2016); (Kodithuwakku, 2015) and (Nawaz et al., 2012). However, The result is contrary to the findings of (Kurawa & Garba, 2014), (Boahene et al., 2012) and (Alshatti, 2015) found the positive effect of non-performing /gross loans ratio on the financial performance of banks. The result indicates that the loan and advances ratio is negative but statistically insignificant. The rate of loan loss provisions (LLPR) shows a positive effect at a 5% level of significance. This means that holding all other variables constant, a unit increase LLPR brings 0.096 units increase on ROA. There is a positive relationship between CAR and ROA. A unit increases in CAR results in with 0.062 increase in ROA.

Table 3 regression results of ROA effect estimate

Variables	Coefficient	Standard error	Probability /z/	Confidence interval	
NPLR	-0.05439	0.007649	0.0000**	-0.07982	-0.029845
CAR	0.06212	0.0519	0.239	0.0287	0.1153
LAR	-0.0007602	0.009843	0.490	-0.05498	0.01986
LLPR	0.09605	0.00761	0.0026*	0.06432	0.13895
C	0.038769	0.005712	0.0000	0.02453	0.49387

Source: Authors' Computation: R² = 56.8%, Prob>, chi² 0.0000 *correlation is significant at the 0.05 level and **correlation is significant at the 0.01 level

7. Discussion on Regression Results

The impact of nonperforming loan on profitability: The result suggests that NPLR which measures the extent

of credit default risk sustained by the banks have a negative effect on ROA. The result in this study suggests the need for strong credit risk management to keep the level of NPL as low as possible which will enable to maintain the high profitability of commercial banks in Eritrea. In order to decrease NPL, the bank should evaluate any potential risk may cause the borrower to default on its loan obligation.

The impact of capital adequacy ratio (CAR) on profitability: As indicated in table 3, there is a positive relationship between CAR and ROA. The minimum CAR requirement of commercial banks is 15%. The result shows that the average CAR of the banks under study was 17.9%, which is higher than the minimum requirement. The bank has a reserve beyond the necessary amount enough to handle unexpected risk. It maintains stability, protection against depositors and confidence on the banks.

The impact of loan loss provisions ratio (LLPR) on profitability: Loan loss provisions ratio has a positive effect on profitability measured by ROA. The management of commercial banks clearly recognized the risk arising from lending business and strengthens their credit risk management capability, in addition to allowing high loan loss provisions to loan and advances.

The impact of Loan and Advances ratio (LAR) on profitability: There is a potential for an increase of profitability on the basis of increase in loan deposit ratio. The study strongly believes that if the banks concentrate the loan-deposit ratio, it will result the profitability of the bank.

8. Conclusion

To identify the impact of credit risk management on the performance of the Commercial banks in Eritrea, descriptive statistics and panel data regression analysis were employed on data collected from the banks over 18 years period (1998-2015). The ratio of nonperforming loan and loan loss provision ratio are sharply declining in recent years. This indicates that the credit risk management of commercial banks in Eritrea had been improving during the study period. The capital adequacy ratio was also found to be a little bit higher than the regulatory requirement. Based on the descriptive analysis, the commercial banks have an adequate capital to withstand shocks resulting from credit and other operational risks. This study found that credit risk measures (nonperforming loan, loan loss provisions, and capital adequacy) have a significant impact on the profitability. The significant positive relationship between loan loss provision and commercial banks performance on this study could indicate the presence of potential earning management activities by bank managers/ board of directors. Commercial banks loan and advances ratio are on average of 59%. Further research can be on accessing banks credit risk management on Eritrean commercial banks (does the banks are bottlenecks for small and medium firms by restrained loans).

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