Asian Journal of Managerial Science
ISSN: 2249-6300 (P), Vol.12 No.1, 2023, pp.19-25

DOI: https://doi.org/10.51983/ajms-2023.12.1.3438

The Impact of Credit Risk on the Profitability of Selected Commercial Banks of Bangladesh

Md. Monzur Morshed Bhuiya[1], Md. Mahabub Miah[2] and Tasnim Uddin Chowdhury[3]
[1]Professor, [2]PG Student,
[1&2]Department of Finance, Jagannath University, Dhaka, Bangladesh
[3]Assistant Professor of Finance, Department of Business Administration, Premier University, Chattogram, Bangladesh
E-mail: mbhuiya74@yahoo.com, mahabub.fin.jnu@gmail.com, tasnim099@gmail.com
(Received 29 December 2022; Revised 10 February 2023, Accepted 16 February 2023; Available online 20 February 2023)

Abstract - **The objective of the study is to find out the impact of credit risk on the profitability of selected commercial banks of Bangladesh. To perform this study, we have selected 10 commercial banks from 61 scheduled commercial banks. The selected banks consist of four categories. Among them, three are state owned banks, three are private owned non Islamic banks, three are private owned Islamic banks and one is specialized commercial bank. To show the impact of credit risk on profitability, we have selected ten variables which are calculated using data collected from 2009 to 2018. Among the ten variables, two variables have been used as dependent variables which include Return on Equity (ROE) and Return on Assets (ROA), and among the independent variables include seven bank specific variables and one macroeconomic variable. To find out the result, multiple-regression model has been used and shown the effects of independent variables on ROE & ROA separately. Besides this, an attempt has been made to find out the effect of Basel III on profitability. To show the effect, we have used three years data before Basel III and three years data after Basel III and showed the individual effect on ROE and ROA. The regression result shows that non-performing loan ratio (NPLR), Loan Loss Provision Ratio (LLPR) and macroeconomic variable GDP has a significant negative impact on profitability ratio ROE. The result also shows that Non-performing loan ratio (NPLR), Loan and advance to total deposits ratio (LATD) have a significant impact on profitability ratio Return on Assets(ROA). The regression result for Basel III effect represented that Nonperforming loan has a significant negative impact on Return on Equity (ROE) but this impact is less than that of before Basel III.**
Keywords: **Credit Risk, Non-Performing Loan, Basel III, Profitability, Bangladesh**

I. INTRODUCTION

Bank is a considerable source of short term, medium term and long term financing as it transfers funds from surplus unit to deficit unit. In this way, Bank promotes to invest in new ventures that contribute to economic growth (Abbas *et al.,* 2014). At present banking system, risk management is considered as a keystone and all banks are combating to manage a number of risks such as liquidity risk, exchange rate risk, credit risk and so on that added a motion on prudent risk management system in the banking system (Al-Tamimi and AlMazrooei, 2007). Providing loan is a key source of bank income and affects the profitability for which credit risk is the most crucial risk banks need to consider. Due to global financial crisis, Banks around the world are suffering from weaknesses of credit risk management that include high loan amalgamation, poor monitoring, inefficient risk measure (Abdelrahim, 2013). Banks have their own policies regarding risk, and they invest more in venture capital to enjoy more return that encourages researchers to identify risk management impact on profitability. So, there arises a demand to investigate the impact of credit risk on profitability of banks in Bangladesh.

Bangladesh is the second highest emerging country in the Southeast Asia and attempts to fulfill vision sustainable development goal (SDG) for which a strong and healthy financial system is required. Bangladesh maintains a gradual GDP growth rate from the last decade and estimated 7.25% GDP growth rate in the fiscal year 2021-2022 according to Bangladesh Bureau of Statistics (BBS). The most five contributors to GDP of Bangladesh are production, retail & wholesale business, transportation, agricultural and construction which contribute 67% of the GDP where these sectors are financed mostly by commercial banks of Bangladesh. In this regard, banking sector plays the most crucial role to run and boost up economic growth of Bangladesh. Besides, commercial banks help to promote remittance inflows and international trade that accelerated GDP growth.

Today's banking sector is not confined to only borrowing money and providing it as a credit but assists in the world trade and sound economic system. In a word, banking sector may be considered as the blood of financial system of Bangladesh. According to Bangladesh bank, at present the banking industry of Bangladesh consists of 61 scheduled commercial banks divided into four categories as private owned commercial banks (43), state owned commercial banks (6), specialized banks (3), and Foreign commercial banks (9). There is a necessity to know which type of banks' performance is appreciated and which types of banks failed to perform and thereby to take necessary steps through identifying problems. Several researches have been conducted on credit risk regarding Bangladesh (Noman *et al.,* 2015; Yeasin, 2022). These are not good enough to take

a conclusive decision. So, there is an immense necessity to analyze the credit risk in the banking industry in an underdeveloped economy like Bangladesh and to support those banks by providing suggestions to run smoothly and to ensure sound environment in banking sector. The organization of the study consists of several steps. First, introduction and research objectives have been established. After that relevant studies on that area are furnished through literature review.

The research methodology consists of an overall process and technique that helps the next step of empirical analysis. Based on several previous studies, we have selected ten variables. Return on assets (ROA), Return on Equity (ROE) are dependent variables whereas non-performing loan ratio (NPLR), Loan and Advance ratio (LATD), Pre provision profit ratio (PPT), Loan loss provision ratio (LLP), Capital adequacy ratio(CAR), Bank size, leverage ratio (TDA) are firm specific variables, and the Gross Domestic Product (GDP) is macroeconomic variable. After that, several steps are decorated with analysis of data and the discussion of data. The study has been ended with a conclusion and some recommendations for the concerned parties.

II. LITERATURE REVIEW

In prudent banking practice, risk management is a cornerstone. The study based on United Arab Emirate's commercial banks found foreign exchange risk followed by credit risk and operating risk is the most important risk (Al-Tamimi and AlMazrooei, 2007. There is a significant relationship between credit management, liquidity and bank profitability among bank's deposit money and recommended to set up deposit money in an effective way with maintaining a balance between deposit- loan ratio (Ejoh *et al.,* 2014). A research conducted in Nigeria recommended that the bank management needs to be more cautious in setting up credit policy that might not negatively affect profitability (Alalade *et al.,* 2014). The loan and capital of Bank affect positively where deposit has a little influence on NIM on the banks of Pakistan (Raza *et al.,* 2019). Credit risk imposes a minimal role in the value creation process and banks achieve shareholders confidence which has higher advances portfolio (Arif *et al.,* 2012).

The study by Poudel (2018) found that NPLR has the significant negative impact on profitability of commercial banks in Nepal. On the other hand, solvency ratio, interest spread rate, and inflation have an insignificant negative impact on profitability. In contrast, capital adequacy ratio, total assets, and GDP growth have the significant positive impact on profitability of commercial banks in Nepal. A significant negative relationship has been found between NPLR and LLRGL (loan loss reserve ratio) and all profitability indicators of commercial banks of Bangladesh. The analysis of Basel II effect showed a significantly positive impact on NIM but significantly negative on ROAE (Noman *et al.,* 2015). Liquidity has a significant positive impact where bank size has a significant negative impact on the effectiveness of credit risk management of the commercial banks of Saudi Arabia. Weak corporate governance, low asset quality, little diversification of credit and lack of financial analysis are the reason behind this problem (Abdelrahim, 2013). LGDs cyclicality, assets maturity bank's ability to pass on higher credit and interest rates risk matter significantly to profitability (Drehmann *et al.,* 2008).

Lending is one of the main functions of a bank and effective monitoring of credit risk is crutial for survival of banks. According to Hosna *et al.,* (2009), both financial crisis and instruction of Basel II raises the significance of credit risk management to banks. Boahene *et al.,* (2012) found a significant positive relationship with banks profitability where some studies found negative relationship. A study performed by Richard *et al.,* (2008) found that the credit risk management system of commercial system varies from less developed economy to more developed economy that means, successful credit risk management system depends on the environment within which the bank operates. Islam (2018) found a negative relationship between NPLR and LLP and profitability of the commercial banks of Bangladesh for period of 2009-2017. The banks should keep low LLP and NPLR for higher profitability.

According to Alper and Anbar (2011), ROE and ROA determine bank profitability as a function of bank specific determinants. The study showed that there is a positive and significant impact of non- interest income, bank size and macroeconomic variable such as real interest rate on the profitability of commercial banks of Turkey. Tan *et al.,* (2012) examined the impact of GDP on the profiability of China Banks.The findings showed that there exists positive relationship between cost efficiency and profitability and higher taxes causes low profitability.According to Abbas *et al.,* (2014), non-performing to total loan and loan loss provision to non-performing loan has negative impact on dependent variables return on assets and return on equity where the ratio of total loan to total deposits has a positive impact on bank profitability.

The study of Kurawa & Garba (2014) found that default rate, cost per loan assets and CAR has a significant positive impact on the profitability of Nigerian banks. Samad (2015) explained that bank specific risks such as loan-deposit ratio, loan-loss provision to total assets, equity capital to total assets and operating expense to total assets have significant impact on profitability where bank size and macroeconomic variables has insignificant impact on bank profitability of commercial banks of Bangladesh. According to Petria *et al.,* (2015) credit risk, liquidity risk, competence of management, business diversification, competition of market and economic growth have significant impact on profitability of EU banks. Gatete (2015) showed that the bank size of Kenya is positively correlated with profitability and the result is found statistically significant. Liquidity, efficiency and capital adequacy are found insignificant to profitability. Onaolapo (2012) analyzed the association

between CRM efficiency and financial performance of selected Nigerian banks and found a negative relationship between CRM efficiency and bank performance and operational effectiveness.

III. OBJECTIVES AND METHODOLOGY OF THE STUDY

A. Objectives of the Study

The main objective of the study is to examine the relationship between credit risk and profitability of some selected banks in Bangladesh. Moreover, the specific objectives of this study are to

1. Identify the effectiveness of Basel III on the selected commercial banks of Bangladesh.
2. Show the impact of some bank specific variables and macroeconomic variables on the profitability of selected commercial banks.
3. Find out the causes of default loan in the commercial banks of Bangladesh.
4. Find out the impact of credit risk on profitability according to some selected bank categories.
5. Identify variables which have the most significance impact on the profitability of selected commercial banks of Bangladesh and provide recommendations to the banking sector about the credit risk to ensure financial soundness of banking industry.

B. Research Methodology

The method that has been used in this study is quantitative. To find the impact of credit risk on the profitability of selected commercial banks, a linear regression model has been used to analyze the data. Besides this, descriptive statistics is used to present the data analysis. To find the credit risk impact on profitability, we have selected 10 variables, where two variables are dependent variables and the other eight variables are independent. To select 10 banks from different categories, random sampling method is used based on easy accessibility of data. The selected 10 banks are Agrani Bank Ltd, Janata Bank Ltd, Basic Bank Ltd, Bangladesh Krishi Bank, Pubali Bank Ltd, IFIC Bank Ltd, Premier Bank Ltd, Islami Bank Bangladesh Ltd, Al Arafah Islami Bank Ltd and Shahjalal Islami Bank Ltd. The data is collected from the secondary sources. The main sources of data are the annual report of the selected banks for the period of 2009 to 2018. As this analysis requires data about credit risk management disclosure, financial statements and notes to financial statements are used. Besides this, supportive data is collected from several published articles and different websites. We have used statistical software SPSS and data arrangement software MS Excel to conduct the analysis.

C. Definition of Variables

Ten variables are found from several studies that can be considered appropriate for this research. As an indicator of profitability, Return on equity (ROE) and Return on assets (ROA) are considered as dependent variables in the regression model because of being widely used in several previous researches. ROE measures a company's ability to accelerate income growth using equity investments and indicates the appropriate use of investment in equity. This ratio is calculated as Net income/Total equity. ROA is a profitability measurement ratio calculated for identifying the amount of profit generated from investment in assets and calculated as Net income/Total assets.

Independent variables include bank's specific variables and macroeconomic variables. In this research, bank's specific variables are those which are determined by bank's management policies such as NPLR, LATD, PPT, LLP, CAR, Bank size and TDA whereas GDP as macroeconomic variables. NPLR is a credit risk management ratio which is calculated as non- performing loans by total loans. LATD ratio is calculated by dividing total loan and advances by total deposits. PPT is a ratio of pre-provision profit to total loan and advances that measures credit risk of a bank. The allowance for loan loss (LLP) is kept for loan and advances that have defaulted and shows as a cost of bank. The ratio is calculated as loan loss provision to total non-performing loan. Bank's profitability is negatively related with Loan loss provision and non- performing loan and has a significant impact on profitability of commercial banks of Bangladesh (Islam, 2018). CAR is a ratio of regulatory requirement of capital which is calculated as (Tier1+ Tier2) capital to total risk weighted assets and used as an indicator of financial system efficiency. A negative and significant impact exists between CAR and ROE. The bank size is considered as the natural logarithm of total assets (Log total assets). There is a significant difference in the profitability of commercial banks for different size of assets. The logarithm of assets is statistically significant with profitability and plays a vital role in competing by reducing cost (Alice, 2015).The leverage ratio (TDA) shows the percentage of assets financed with debt and suitable to creditors to identify the weight of debt. This ratio is calculated as total debt to total assets. In this study, real GDP growth rate is used as variable for the period of 2009-2018. A negative relation exists between GDP and profitability of banks in China (Tan *et al.,* 2012).

The basic framework for the panel data is defined according to the regression model which is presented as below:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta 4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \varepsilon$$

Where generally Y is the dependent variables, α is the constant term, β is the coefficient of the function, X is the value of independent variables and ε is the error term that express the effect of others variables except those are used in this function. In this study we used Y as ROE and ROA, X_1= NPLR, X_2 = LATD, X_3 = PPT, X_4 = LLP, X_5 = CAR, X_6 = Bank Size, X_7 = TDA and X_8 = GDP.

Thus, the regression equation can be written as follows.

$ROE = \alpha + \beta_1 NPLR + \beta_2 LATD + \beta_3 PPT + \beta_4 LLP + \beta_5 CAR + \beta_6 Size + \beta_7 TDA + \beta_8 GDP + \varepsilon$

$ROA = \alpha + \beta_1 NPLR + \beta_2 LATD + \beta_3 PPT + \beta_4 LLP + \beta_5 CAR + \beta_6 Size + \beta_7 TDA + \beta_8 GDP + \varepsilon$

IV. EMPIRICAL RESULTS

A. Descriptive statistics

Descriptive statistics is shown in Table I that describes the features and overall idea about observations and samples that had been collected for the period 2009-2018. The table describes the minimum and maximum value of return on equity (ROE) is -2.74 and .8872 respectively where mean and standard deviation is 9.83% and 36.52% respectively. On the other hand, return on asset (ROA) provides its minimum and maximum value -18.90% and 2.63% respectively with 0.15% mean and 0.028 standard deviation. The average credit risk ratios such as NPLR, LATD and PPT are 50.72%, 86.20% and 3.20% gradually generating standard deviation of 0.219, 0.168 and 0.036 respectively. The mean of regulatory capital requirement ratio (CAR) is 23.61% and standard deviation is 1.592 whereas it varies from -.43 to 15.85 as well. From the table it can also be seen that the mean of leverage ratio TDA and the macro-economic variables such as GDP is 5.08%, 6.59% where standard deviation is .050 and .007 respectively for the period 2009-2018.

TABLE I DESCRIPTIVE STATISTICS OF VARIABLES (ALL BANKS)

Variables	Minimum	Maximum	Mean	Std. Deviation
ROE	-2.7408	.8872	.098315	.3652130
ROA	-.1890	.0263	.001469	.0287413
NPLR	.0081	1.0540	.157208	.2198321
LATD	.1153	1.2107	.862078	.1686898
PPT	-.0411	.3043	.032014	.0369690
LLP	-.5100	.7032	.143615	.1850856
CAR	-.4379	15.8589	.236161	1.5923716
Bank Size	10.6562	11.9991	11.341349	.3270610
TDA	.0000	.2061	.050809	.0501660
GDP	.0530	.0790	.065900	.0075805

B. Correlation Matrix

Table II shows the correlation matrix of all selected banks for independent variables for the period 2009-2018. The correlation table shows that the independent variables are not so strongly correlated with each other. Among the several correlations of table, the highest correlation exists between GDP and Bank size which is .492 or 49.2%. CAR (capital requirement ratio) and LLP (loan loss provision ratio) show the lowest positive correlation which is .009 or .9% whereas TDA (leverage ratio) and NPLR (non-performing loan) shows the lowest negative correlation by -.9%. GDP and LLP provide no correlation between them. So, from the correlation matrix it can be said that there is no multicollinearity.

TABLE II CORRELATION BETWEEN INDEPENDENT VARIABLES (STATE OWNED COMMERCIAL BANKS)

Variables	NPLR	LATD	PPT	LLP	CAR	Bank	TDA	GDP
NPLR	1							
LATD	-.044	1						
PPT	-.367	-.342	1					
LLP	-.241	.020	.301	1				
CAR	.262	-.228	.379	-.109	1			
Bank Size	.103	-.679	.136	-.063	.202	1		
TDA	-.199	.349	.029	.076	.056	-.335	1	
GDP	.206	.105	-.545	-.211	-.099	.450	.143	1

*Correlation is significant at the 0.05 level (2-tailed) **Correlation is significant at the 0.01 level (2-tailed)

C. Regression Statistics

Equation 1: The equation 1 is formed to show the relationship between dependent variable ROE and independent variables. Table III shows the empirical result for regression equation where dependent variable is ROE. The table describes that among the independent variables NPLR, LLP and GDP have a significant impact on ROE whereas LATD, PPT, CAR, Bank size and TDA has an insignificant impact on ROE. The result of Table III shows that the coefficient of NPLR is -.419 which means that if NPLR is increased by 1unit the ROE is decreased by .491unit. On the other hand, LLP and GDP also affect ROE negatively where one unit increase in LLP causes .502 and one unit increase in GDP causes 12.399 decrease in ROE respectively. Beside this, LATD, PPT, CAR, Bank size and TDA has a positive but insignificant impact on the ROE of the commercial banks of Bangladesh for the period 2009-2018. This means that the increase of these variables also increase ROE in an insignificant way.

TABLE III COEFFICIENT SUMMARY TABLE FOR ROE (ALL BANKS)

ROE*	Coefficient	Std. Error	T-Ratio	P-Value	Comment
(Constant)	-1.478	1.553	-.952	.344	
NPLR	-.419	.171	-2.456	.016	**
LATD	.036	.274	.133	.895	
PPT	1.053	1.208	.872	.386	
LLP	-.502	.200	-2.516	.014	**
CAR	.008	.022	.368	.713	
Bank Size	.213	.143	1.493	.139	
TDA	1.008	.834	1.209	.230	
GDP	-12.399	5.856	-2.117	.037	**

* Dependent Variable: ROE, ** statistically significant at 5%

TABLE IV COEFFICIENT SUMMARY TABLE FOR ROA (ALL BANKS)

ROA*	Coefficient	Std. Error	T-Ratio	P Value	Comment
(Constant)	.013	.111	.114	.909	
NPLR	-.025	.012	-2.046	.044	**
LATD	.056	.020	2.840	.006	**
PPT	.329	.087	3.798	.000	**
LLP	-.029	.014	-2.023	.046	**
CAR	.001	.002	.560	.577	
Bank Size	-.003	.010	-.319	.751	
TDA	-.094	.060	-1.572	.119	
GDP	-.307	.419	-.732	.466	

* Dependent Variable: ROA, **statistically significant at 5%

Equation 2: The equation 2 is formed to show the relationship between dependent variable ROA and independent variables.

Table IV shows the empirical results for regression equation where dependent variable is ROA. The table describes that among the independent variables NPLR, LATD, PPT and LLP have a significant impact on ROA whereas CAR, Bank size, TDA and TDA has an insignificant impact on ROA. The results of Table IV show that the coefficient of NPLR is -.025 which means that if NPLR increases by one unit the ROA decreases by .025 while other variables are held constant. LATD and PPT affect ROA positively and one unit increase of these variables causes .056 and .329 unit increase in ROA. On the other hand, LLP affects ROA negatively where one unit increase in LLP causes .029 unit decreases in ROA. CAR has a positive insignificant impact on ROA. Furthermore, Bank size, GDP and TDA has a negative but insignificant impact on ROA in the commercial banks of Bangladesh for the period 2009-2018, which means that the increase of these variables decrease the ROA in an insignificant way.

D. Basel III application effects on ROE

Basel III is a standard to maintain capital and liquidity set by international settlement and the implementation has been started in Bangladesh since 1st January 2015 according to Bangladesh Bank order. Before establishing Basel III, Basel II is followed by the banks of Bangladesh. In comparison to Basel II, Basel III requires more equity, capital, leverage ratio and liquidity ratio. Table V shows a comparison

between before Basel III implementation and after Basel III implementation. Table V shows NPLR affects ROE negatively before and after implementing Basel III, but it affects 4.3% less after implementing Basel III.

TABLE V COEFFICIENT SUMMARY TABLE, BASEL III EFFECTS ON ROE

ROE*	Coefficient		P-Value	
	Before	After	Before	After
(Constant)	.683	-5.042	.926	.085
NPLR	-1.175	-1.132	.189	.004
LATD	-.957	-.141	.447	.596
PPT	-3.099	1.725	.417	.515
LLP	-.813	-.481	.202	.124
CAR	.675	.010	.343	.487
Bank Size	.249	.426	.586	.105
TDA	3.864	2.342	.280	.125
GDP	-38.799	4.110	.646	.802

*ROE dependent variable

Furthermore, after following Basel III NPLR affects ROE significantly whereas before following it affects insignificantly. That means that before Basel III NPLR could predict the variance of ROE with 81.1% probability but after 99.6% probability. LATD and LLP both have negatively insignificant effects before and after implementation Basel III, but they affect ROE less after Basel III.

E. Basel III applications effect on ROA

Table VI shows a comparison between before Basel III implementation and after implementation of Basel III for dependent variable ROA.

TABLE VI COEFFICIENT SUMMARY TABLE, BASEL III EFFECTS ON ROA

ROA	Coefficients		P-Value	
	Before	After	Before	After
(Constant)	.411	-.223	.159	.651
NPLR	-.060	-.080	.087	.204
LATD	-.012	.058	.805	.216
PPT	-.031	.576	.832	.219
LLP	-.052	-.034	.040	.519
CAR	.057	.001	.045	.774
Bank Size	-.010	-.002	.559	.972
TDA	-.131	.050	.343	.846
GDP	-4.215	2.423	.205	.400

*ROA dependent variable

Table VI shows NPLR affects ROE negatively before and after implementing Basel III, but it affects 2.0% more after implementing Basel III. Furthermore, NPLR affects ROE insignificantly both before and after implementing Basel III but this insignificance level is more after Basel III. That means that before Basel III NPLR could predict the variance of ROA with 91.3% probability but after 79.6% probability. LATD, PPT and TDA have negative insignificant effects before implementing Basel III but positive insignificant effects after implementation Basel III. On the other hand, LLP and Bank size has a negative impact before and after implementing Basel III whereas LLP has significant impact before Basel III but insignificant impact after Basel III.

V. CONCLUSION

The main purpose of the study is to examine the impact of credit risk on the profitability of commercial banks of Bangladesh. The result shows that credit risk ratio NPLR has a significant negative impact on ROE. Besides the credit risk ratio, the study also found that loan loss provision ratio and macroeconomic variable GDP has a significant negative impact on profitability ratio ROE.GDP has the most significant impact on ROE. One unit increases in GDP causes 12.399 unit decreases in ROE where one unit increases in LLP and NPLR causes .502 units & .491 unit decreases in ROE respectively. The result also shows that NPLR, LATD, PPT and LLP have a significant impact on profitability ratio ROA. NPLR and LLP have negative impact on ROA where LATD and PPT have positive impact on ROA of all selected commercial banks of Bangladesh. The loan loss provision has the most significant negative impact on ROA as it is liable to decrease .029 unit ROA for one unit increase in LLP where one unit increase in NPLR reduce .025 unit ROA. The regression result for Basel III effect describes that NPLR has a significant negative impact on ROE, but this impact is less than that of before Basel III. From the result, it can be seen that after implementing Basel III, the impact of all variables on ROE has reduced except bank size. Furthermore, before Basel III, LATD, PPT, TDA and GDP have a negative impact on ROA but after Basel III, they affect ROA positively. After implementing Basel III, the impact of non-performing loans has increased on the return on assets. From the overall analysis, it can be said that the credit risk ratio NPLR has a significant impact on the profitability of commercial banks of Bangladesh. As several literature and this study shows that non-performing loan has a negative effect on profitability, the management need to take appropriate steps such as enact regulations and force everyone to follow these regulations, trained the employee on credit risk management, introduce credit rating system to minimize non-performing loan that helps banking sector to ensure financial soundness. Further research may be performed by considering all the commercial banks of Bangladesh for more time period and including more variables such as Operating cost to loan (OCL) ratio (total operating cost/total loan), Return on Risk Adjusted Capital (RORAC) calculated as (net income/ risk weighted assets), and Risk Adjusted Return on Capital (RAROC) calculated as (expected return/ value at risk) and so on.

REFERENCES

[1] Abbas, A., Zaidi, S. A. H., Ahmad, W., & Ashraf, R. U. (2014). Credit Risk Exposure and Performance of Banking Sector of Pakistan. *Journal of Basic and Applied Scientific Research, 4*(3), 240-245.

[2] Abdelrahim, D. K. (2013). Effectiveness of credit risk management of Saudi banks in the light of financial crisis: A Qualitative Study. *Asian transactions on Basic and Applied Sciences, 3*(2), 73-91.

[3] Alalade, S. A., Binuyo, B. & Oguntodu, J. (2014). Managing Credit Riskto Optimize Banks' profitability: A survey of selected Banks in Lagos State, Nigeria. *Research Journal of Finance and Accounting, 5*.

[4] Al-Tamimi, H. A. H., & AlMazrooei, F. M. (2007). Bank's risk management: A comparison study of UAE National and Foreign banks. *The Journal of Risk Finance, 8*(4), 394-409.

[5] Arif, A., Abrar, A., & Afzal, M. (2012). Credit risk and shareholders' Value in a Developing Economy: Evidence from Pakistani Banking System. *Journal of Economics and Behavioral Studies, 4*, 87-95.

[6] Drehmann, M. Sorensen, S., & Stringa, M. (2008). The Integreted Impact of Credit and Interest Rate Risk on Banks: An Economic Value and Capital Adequacy Perspective. *Bank of England Woring Paper No, 339*.

[7] Ejoh, N. O., Okpa, I. P., & Egbe, A. A. (2014). The impact of credit and liquidity risk management on the profitability of deposit money banks in Nigeria. *International Journal of Economics, Commerce and Management, 2*(9).

[8] Gatete, A. (2015, October). The effect of bank size on profitability of commercial banks in Kenya. Retrieved from http://erepository. uonbi.ac.ke/bitstream/handle/11295/93718/Alice%20gatete_%20The %20effect%20of%20bank%20size%20on%20profitability%20of%20 commercial%20banks%20in%20Kenya%20%20.pdf?sequence=3.

[9] Hosna, A., Manzura, B. & Juanjuan, S. (2009). Credit risk management and profitability in commercial Banks in Sweden. *Gothenburg University Library*, Retrieved from http://hdl.handle. net/2077/20857.

[10] Islam, F. T. (2018). Evaluating Loan Loss Provisioning for Non-Performing loans and Its Impact on the Profitability of commercial Banks in Bangladesh. *Asian Finance & Banking review, 2*(2), 33-41.

[11] Kurawa, J. M., & Garba, S. (2014). An Evaluation of the effect of Credit Risk Management (CRM) on the profitability of Nigerian Banks. *Journal of Modern Accounting and auditing, 10*(1), 104-115.

[12] Noman, A. H. M., Pervin, S., Chowdhury, M. M. C., & Banna, H. (2015). The Effect of Credit Risk on the Banking Profitability: A Case on Bangladesh. *Global journal of Management and Business, 15*(3), 40-48.

[13] Onaolapo, A. R. (2012). Analysis of credit risk management efficiency in Nigeria commercial banking Sector, (2004-2009). *Far East ournal of Marketing and Management, 2*. Retrieved from https://ideas.repec.org/a/fej/artcal/v2ay2012i4p39-52.html.

[14] Petria, N. P., Capraru, B., & Ihnatov, I. (2015). Determinants of banks' profitability: E6vidence from EU 27 banking system. *Procedia Economics and Finance, 20*, 518-524.

[15] Poudel, S. R. (2018). Impact of credit risk on profitability of commercial banks in Nepal. *Journal of Applied and Advanced Research*, *3*(6), 161-170.

[16] Raza, H., Saeed, A., & Hena, S. (2019). Determinants of Profitability in Banking Sector: An Evidence from Pakistan. *European Scientific Journal, 15*(7), 35-48.

[17] Richadr, E., Chijoriga, M., Kaijage, E., Peterson, C., & Bohman, H. (2008). Credit risk management system of a commercial bank in Tanzania. *Internationat journal of Emerging Markets, 3*(3), 323-332.

[18] Samad, A. (2015). Determinants of Banks Profitability: Emperical Evidence from Bangladesh Commercial Banks. *International Journal of Financial Research, 6*(3). DOI: 10.5430/ijfr.v6n3p173.

[19] Tan, Y. A, & Floros, C. (2012). Bank Profitability and GDP Growth in China: A note. *Journal of Chinese Economic and Business Studies*, *10*(3), 267-273.

[20] Yeasin, H. M. (2022, January 24). Impact of credit risk management on financial performance: A study of commercial banks in Bangladesh. *Interdisciplinary journal of Applied and Basic Subjects, 2*(1), 14-22.