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Credit risk management and profitability of commercial banks in Nepal

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Abstract
A strong credit risk management avoids significant drawback and increase financial performance of banks. Good financial performance rewards employee as well as shareholders for their working environment and investment. The credit risk management is an important predictor for the profitability of the bank. Therefore, the credit risk management greatly impact on profitability of the bank. Data were collection from the sample of 15 commercial banks operated in Nepali economy for the period of 2011 to 2020 have been collected and analyzed using mean, standard deviation, correlation and regression analysis. Pooled regression analysis model (OLS) of panel data analysis is used as a major tool of analysis. In the model specification return on equity (ROE) was used as bank profitability indicators while capital adequacy ratio, cash reserve ratio, loan loss provision ratio, non-performing loan ratio and bank size were used as indicators of credit risk management. The finding indicates that credit risk has the significant impact on profitability of commercial banks in Nepal. The study reveals that cash reserve ratio, loan loss provision ratio and non-performing loan ratio has insignificant negative impact on return on equity in Nepali commercial bank. The study reveals that bank size and liquidity ratio has positive impact on return on equity. The study also reveals that liquidity ratio has significant positive impact on return on equity in Nepali commercial bank. Capital adequacy ratio also reveals has significant negative impact on return on equity. Thus, this study concludes that the credit risk management is an important predictor for the profitability of the bank. Therefore, the success of the bank in term of profitability depends on its credit risk management.

Keywords: return on equity, capital adequacy ratio, loan loss provision ratio, cash reserve ratio, liquidity ratio, non-performing loan ratio and bank size

Introduction

Credit risk (also known as default risk, performance risk, or counterparty risk) is defined as the possibility that a contractual party will fail to meet its obligation in accordance with the agreed terms (Brown and Moles, 2012). 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 a debtor or counterparty will default in satisfying a contractually predetermined obligation according to the agreed-upon terms. It is a risk of financial loss whereby money invested by their customers in the form of loans is not repaid (Giesecke, 2004). Because of the nature of their business, banks face significant credit risk, and the success of their financial performance is dependent on the efficient management of this and any other type of risk that they face (Giesecke, 2004). Banks are very important in every economy because they provide special functions or services in the country (Altman *et al*., 2002). There are plenty of differences between types of banks. And much of this differentiation rests in the products and services that banks offer (Howells and Bain, 2008). For instance, commercial banks hold deposits, bundling them together as loans, operating payment mechanisms, etc. Nowadays, financial institutions play a highly significant, even vital, role in an economy. According to Rajaraman and Vasishtha (2002), Kroszner *et al*. (2007), and Kristo (2013), financial system stability is the foundation of modern macroeconomic policy and a prerequisite for strong economic growth, which ensures macroeconomic stability and enables strong financial institutions (Bairamli and Kostoglou, 2010).

Credit risk management (CRM) in a financial institution starts with the establishment of sound lending principles and an efficient framework for managing the risk. Policies, industry-specific standards, and guidelines, together with risk concentration limits, are designed under the supervision of the risk management committee. These policies, standards, and procedures also govern how credit risk is measured, monitored, reported, and controlled. As market conditions change rapidly, the adequacy and effectiveness of internal controls should be reviewed regularly to manage credit risk effectively. Risk management is defined as the process that a bank puts in place to control its financial exposures (Santimero, 1997). Policies, industry-specific standards, and guidelines, together with risk concentration limits, are designed under the supervision of the risk management committee. The profitability ratios used to measure how well a business is functioning in terms of profit as market conditions change rapidly, the adequacy and effectiveness of internal controls should be reviewed regularly to manage credit risk effectively. Risk management is defined as the process that a bank puts in place to control its financial exposures (Chatterjee, 2005).

In today's context, it also affects the national economy to some extent because if the bank provides credit to a retailer, it will raise the customer's status. Similarly, it provides cash to trade and industry too. The government will get taxes from them and help increase the national economy. It also provides security against depositors. Credit is assumed to be the wealth maximization derivative from the start. However, other factors can also affect profitability and wealth maximization, but the most effective factor is regarded as credit risk. It is the most challenging task because it is the

backbone of commercial banking. Thus, effective management of credit should seriously be considered. Credit extended to borrowers may be at risk of default, so that whereas banks extend credit on the understanding that borrowers will repay their loans, some borrowers usually default, and as a result, banks' income decreases due to the need to make provisions for the loans. 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 in their profits.

Review of Literature

In this section of the study, findings from the recent studies which examines the profitability of the commercial bank has been reviewed. Afriyie and Akotey (2012) [8] examined the impact of credit risk management on the profitability of rural and community banks in Ghana by using a panel regression model for the period of 2006 to 2010. The independent variables that the author has taken are non-performing loans and capital adequacy ratio as indicators of credit risk management, whereas the dependent variables that the author has taken are return on assets and return on equity as indicators of the profitability of the bank. The findings of the study showed a significant positive relationship between non-performing loans and the profitability of the bank, which means non-performing loans are increasing proportionately to profitability. The author has discovered the root cause of ineffective credit risk management: the bank shifts the cost of loan defaults to other customers who have higher interest loans.

Bhattarai (2016) [9] has examined the effect of credit risk on the performance of Nepalese commercial banks using pooled data from 14 commercial banks for the period of 2010 to 2015. The author found that the non-performing loan ratio has a negative effect on bank performance, whereas cost per asset has a positive effect on bank performance. Moreover, the author concluded that there is a significant relationship between bank performance and credit risk indicators.

Pradhan and Shrestha (2017) examined the impact of capital adequacy and bank operating efficiency on the financial performance of Nepalese commercial banks using data from the period of 2005–06 to 2012–13. The result showed that total deposits to total assets and banks' operating efficiency are the major variables determining the financial performance of commercial banks in Nepal. Similarly, bank operating efficiency, loan ratio, total deposit to total assets, and loan loss provision to total equity have a significantly positive impact on the financial performance of commercial banks. Loan loss provisions to the total loan core capital ratio, the risk-weighted ratio, and the total capital ratio have a negative impact on the financial performance of Nepalese commercial banks.

Kaaya and Pastory (2013) evaluated the linkage between the credit risk measures and the financial health (ROA) of eleven banks in Tanzania with the help of a regression model. A negative relationship between the variables has been found, which proves more risk in credit advancements would result in more losses to banks or lower banking profits. Singh (2013) investigated various types of credit advances, their impact on loan superiority, the development and distribution of various guidelines to strategic business units (SBUs) for NPAs and recoveries, the volume of exposure, periodic performance reviews, adequate controlling and monitoring mechanisms, and so on.

Onuko *et al*. (2015) analyzed the impact of management of credit risk on the quality of the loan portfolios of tier-I Kenyan commercial banks. The study was based on both primary and secondary sources of data collection. Five Tier I Kenyan commercial banks were selected for the study. For the purpose of collecting data from the primary source, the questionnaire method was adopted for the selected banks, whereas for the secondary source, data was collected from audited financial statements and Central Bank of Kenya (CBK) reports of five banks from 2009 to 2013. Descriptive statistics and a regression model were used to analyze the data. In the regression model, the independent variable was measured as loan pricing, whereas the dependent variable was measured as the quality of the loan portfolio. The proxy for loan portfolio quality was indicated by non-performing assets (NPAs). According to the empirical findings, loan pricing was significantly and positively related to NPA.

Tuladhar (2017) investigated the impact of credit risk management on the profitability of a Nepalese commercial bank. Data from twenty-eight commercial banks for the period of 2011–2015 have been collected and analyzed using pooled regression analysis and panel data analysis. As indicators of credit risk management, the independent variables in this study are capital adequacy ratio (CAR), liquidity ratio (LR), bank size (BS), asset quality ratio (AQR), leverage ratio (LER), non-performing loan ratio (NPLR), cash reserve ratio (CRR), coverage ratio (CR), and the number of female board members (FBM), while the dependent variables are return on equity (ROE) and return on assets (ROA).The result showed that coverage ratio, capital adequacy ratio, and bank size have a positive impact on the performance of the bank. However, the leverage ratio, non-performing loan ratio, and female board members were discovered to have a negative impact on the bank's performance; however, the liquidity ratio, asset quality ratio, and cash reserve ratio were discovered to be insignificant variables in determining the bank's performance. The study recommends an effective credit risk management strategy for the commercial bank of Nepal that should maintain the optimal level of the above-mentioned variables to enhance financial performance.

Zubairi and Ahson (2014) [49] examined the strength of the linkage between current risk management practices and profitability of five Islamic banks in Pakistan over a seven-year period (2007–2013) using primary (a survey questionnaire) and secondary data (annual reports). The dependent variables in this ROA and ROE are similar to those in many other studies.The explanatory variables are advances and investments/total assets, number of branches, GDP per capita, interest rates, competition, and taxation. In this study, a pooled regression analysis was employed to ascertain the relationship between risk management practices and bank profitability. The study concludes that risk management had a significantly negative impact on profitability during the period 2007–2013.

Poudel (2012) [41] attempted to identify the various parameters pertinent to credit risk management as it affects banks' financial performance by using data from 31 commercial banks in Nepal from 2001 to 2011 and applying multiple regression analysis. The parameters specified in the study were default rate, cost per loan asset, and capital adequacy ratio. The findings revealed that all these factors have an inverse impact on banks' financial performance and that default rate is the most significant predictor of bank

financial performance. Based on the findings, the author suggests that Nepalese commercial banks place a greater emphasis on risk management, as risk management in general has a significant impact on bank performance. Further, the author recommends that in order to reduce risk on loans and achieve maximum performance, the banks need to allocate more funds to default rate management and try to maintain an optimum level of capital adequacy.

Wolday, E. (2015) [48] investigated the impact of credit risk management on the performance of a selected commercial bank in Ethiopia. The author has selected seven commercial banks credit risk management on the performance of a selected commercial bank in Ethiopia. The author has selected seven commercial banks as a sample using balance panel data from 2009 to 2013, and 35 observations have been used for the analysis. The study only used a quantitative approach, focusing on the description of SPSS output, and conducted empirical analysis using a regression model. The independent variables used by the author included loan loss provision, liquidity, operating inefficiency, loan growth, and capital adequacy ratio as credit risk management, whereas the dependent variable used return on equity as an indicator of profitability. The findings of the study showed that loan loss provision, operating inefficiency, and loan growth have positive and statistically significant impacts on bank profitability; profitability and capital adequacy have a negative but statistically significant relationship with bank return on equity. The author advised commercial banks to prioritize legally inspected credit risk factors.

Methodology

The research design used in this study is descriptive and causal comparative research design, which is used to deal with the issues relating to profitability associated with the commercial banks operated in Nepal.

Table 1: Name and sample banks for the study

SN	Name of the selected banks	Period Covers	Observation
1	Nepal Bank Limited	2011/12 - 2020/21	10
2	Rastriya Banijya Bank Limited	2011/12 - 2020/21	10
3	Nabil Bank Limited	2011/12 - 2020/21	10
4	Nepal Investment Bank Limited	2011/12 - 2020/21	10
5	Standard Charted Bank Nepal Ltd	2011/12 - 2020/21	10
6	Himalayan Bank Limited	2011/12 - 2020/21	10
7	Nepal SBI Bank Limited	2011/12 - 2020/21	10
8	Everest Bank Limited	2011/12 - 2020/21	10
9	Nepal Credit & Commerce Bank	2011/12 - 2020/21	10
10	NIC Asia Bank Limited	2011/12 - 2020/21	10
11	Global IME Bank Limited	2011/12 - 2020/21	10
12	Machhapuchre Bank Limited	2011/12 - 2020/21	10
13	Kumari Bank Limited	2011/12 - 2020/21	10
14	Siddhartha Bank Limited	2011/12 - 2020/21	10
15	Mega Bank Limited	2011/12 - 2020/21	10

The overall study is based on the secondary sources of data. Table 1 shows the name of the sample commercial banks selected for the study along with the study period and number of observations. Pooled OLS model of panel data analysis is used as a major tool for data analysis to identify the major indicators of profitability in commercial banks operated in Nepali economy. The model used for the analysis is;

$$Y = \alpha + \beta X_{it} + \varepsilon_{it} \quad (1)$$

Where, Y is the dependent variable α is constant; β is the coefficient of explanatory variable, X_{it} is the vector of explanatory variables, and ϵ_{it} is the error term and in addition, we note that i = 1, 2, 3,....15 commercial banks while t = 1, 2, ….10 since this analysis captures ten years. Adapting this basic model, following model, following models are estimated.

The model can also be presented in detail as follows;

$$ROE_{it} = \alpha + \beta 1 CAR + \beta 2 LR + \beta 3 NPL + \beta 4 CRR + \beta 5\ LLP + \beta 6 BZ + \varepsilon_{it} \quad (1a)$$

Where,

ROE_{it} Represents return on equity of bank *i* in year *t*;

CAR represents capital adequacy ratio of bank *i* in year *t;*

LR represents Liquidity ratio of bank of bank *i in* year *t;*

NPL represents Non-performing loan ratio of bank of banks *i in* year *t;*

CRR represents Cash Reserve ratio of bank of banks *i in* year *t;*

LLP represents Loan-loss Provision ratio of bank of banks *i in* year *t;*

BZ represents Bank size ratio of bank of banks *i in* year *t;*

The detail definitions of the explained as follows;

Dependent Variable

Return on Equity (ROE)

Return on equity (ROE) is the ratio of net income to total equity capital, which measures the return to shareholders on their equity. It measures how well the management is utilizing the shareholder's invested money to generate profit (Athanasoglou, Brissimis, & Delis, 2008). ROE is one of the most important measures for evaluating the efficiency and profitability of a bank's management based on the equity that shareholders have contributed to the bank. The equation for ROE is written as,

$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Total Equity}}$$

Independent Variable

Capital Adequacy Ratio (CAR)

The capital adequacy ratio, calculated as the ratio of the amount of capital to the risk-weighted sum of a bank's assets, is a measure of a bank's capital amount expressed as a percentage of its risk-weighted credit exposure (Poudel,

2012) [41]. The equation for capital adequacy ratio (CAR) is given by:

$$CAR = \frac{\text{Total Capital}}{\text{Risk weighted assets}}$$

Liquidity ratio (LR)

Liquidity in banks refers to a situation where they can manage sufficient funds either by increasing their liabilities or converting their assets to cash at a reasonable cost in a short span of time (Abdelrahim, 2013). The equation for liquidity ratio (LR) is mathematically given by:

$$\text{Liquidity ratio (LR)} = \frac{\text{Liquidity assets}}{\text{Total deposit}}$$

Non-performing loan ratio (NPL)

Among various indicators of credit risk and financial stability, the non-performing loan ratio (NPL) holds critical importance, as an increase in NPL is regarded as a failure of credit policy in banks, a reduction in bank earnings, and a major reason for the financial crisis (Saba, Kouser, & Azeem, 2012). The equation for the non-performing loan ratio (NPL) is expressed as:

$$NPL = \frac{\text{Non performing loans}}{\text{Total loan}}$$

Cash Reserve Ratio (CRR)

The cash reserve ratio is specified as a percentage of the total deposits of customers held by the central bank. It is one of the monetary policy tools used by the reserve bank to control the money supply in the economy (Abid & Lodhi, 2015). The equation for cash reserve ratio (CRR) is given by:

$$\text{Cash Reserve Ratio (CRR)} = \frac{\text{Reserves requirement with the NRB}}{\text{Total deposits of customers}}$$

Bank Size (BS)

Bank size accounts for the existing economies and diseconomies of scale in the banking market (Athanasoglou, Brissimis, & Delis, 2008). The calculation for bank size used in this study is as follows:

Bank Size = Natural logarithm of total assets

Loan- loss Provision Ratio (LLP)

Loan loss provisions are the portion of the loan repayments set aside by banks to cover the portions of the loss on defaulted loan payments. It helps the bank balance the income and survey during bad times and is recorded in the income statement as a non- cash expense.

$$\text{Loan loss provision ratio} = \frac{\text{Loan loss provision}}{\text{Total loan}}$$

Results and Finding

In this section of the study, the results from the secondary data for profitability in Nepali commercial banks have been presented. Different statistics, correlation matrix and panel data analysis were used as the major tools for the analysis.

Descriptive statistics

Descriptive statistics includes minimum value, maximum value, mean value and standard deviation with of 15 commercial banks for the study period 2011 to 2020 that makes total of 150 observations. In this table profitability is dependent variable and Bank size, Capital adequacy ratio, Cash reserves ratio, Loan loss provision, liquidity ratio and Non-performing loan are independent variables.

Table 2: Descriptive statistics of the variables

Variables	N	Mean	Std. Dev.	Minimum	Maximum
ROE	150	15.786	9.3812	-6.07	76.9599
CAR	150	12.7252	3.6262	-9.35	23.68
CRR	150	15.1799	8.8987	3.05	37.52
LQ	150	30.6171	7.5529	20.1	57.44
LLP	150	0.6927	0.5734	0.008	2.68
NPL	150	1.6618	1.3309	0.08	7.27
BS	150	11.3998	0.7034	9.3413	13.2534

(**Sources:** Annual Report of Banks)

According to Table 4.2, the average ROE number is 15.786 percent, meaning that from 2011 to 2020, the equity of commercial banks generated a return of 15.786 percent. As opposed to the regulatory requirement of the NRB 2020 regulation, which is 11 percent, the minimum capital adequacy ratio is -9.35 percent, which is extremely low. The average CAR, however, is 12.7252 percent, which exceeds the NRB's legal threshold. The required regulatory minimum cash reserve ratio is 4%, whereas the actual ratio is 3.05 percent. This could be interpreted as a breach of Nepal Rastra Bank's (NRB's) Unified 2015 regulations requiring commercial banks to maintain CRR. Between 2011 and 2015, the average non-performing loan ratio was 1.6618 percent. How far the variable deviates from the mean is shown in the standard deviation column. In this case, BS, and LLP have the lowest standard deviations, but ROE and CRR have the most. Our factor is more spread out or changeable the bigger the standard deviation.

Correlation Analysis

In this section of analysis, the Pearson correlation coefficients between different pairs of research variables have been analyzed.

Table 3: Pearson Correlation coefficients

Variables	ROA	ROE	NPL	LQ	LLP	CRR	CAR	BS
ROA	1							
ROE	0.5395**	1						
NPL	-0.0939*	0.0118	1					
LQ	0.2833**	0.2690*	0.2029**	1				
LLP	0.0255	0.0962	0.3697*	0.2844**	1			
CRR	-0.0368	0.0480	-0.0261*	0.1409*	0.2444**	1		
CAR	0.1331	-0.1014**	-0.6014	-0.1507**	-0.2877**	-0.1785**	1	
BS	0.0646	0.0220	-0.1344	-0.0913	-0.3202**	-0.0739	0.0794**	1

Note: Results are drawn from EVIEWS- 12

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

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

The value of the correlation coefficient r is (-0.0939*), which means there is a negative linear relationship between the non-performing loan ratio and return on assets. The negative relationship further confirms that the higher the credit risk, the lower the profitability among the commercial banks in Nepal. Similarly, the value correlation coefficient r = (-0.0368), indicating that the cash reserve ratio and return on assets have a negative and significant relationship. This means that the higher the CRR, the lower the profitability. The results show that there is a positive and significant relationship between the capital adequacy ratio (0.1331) and the return on assets. The positive relationship between the capital adequacy ratio and return on assets further confirms that the higher the capital adequacy ratio, the higher the profitability among the commercial banks in Nepal. Similarly, the correlation coefficients of LQ (0.2833**), LLP (0.0255), and BS (0.0646) are positive with return on assets. The positive correlation coefficients further confirm that the higher the LQ, LLP, and bank size, the higher the profitability among the commercial banks in Nepal. The correlation coefficient of CAR (-0.1014**) with return on equity shows a negative relationship with return on equity. The negative relationship between capital adequacy ratio and return on equity further confirms that the higher the CAR, the lower the profitability among the commercial banks in Nepal. The correlation coefficients of NPL (0.0118), LQ (0.2690*), LLP (0.0962), CRR (0.0480), and BS (0.0220) are positive with return on equity. The positive correlation coefficient further confirms that the higher the NPL, LQ, LLP, CRR, and BS, the higher the profitability among the commercial banks in Nepal.

Regression Results

Regression analysis is a mathematical tool that uses to estimate or predict the cause- effect relationship between the two or more variables. In this study, a panel data analysis model is employed for data analysis. There are three estimation models for the panel regression model, i.e., polled ordinary least square (POLS), random effect model (REM) and fixed effect model (FEM). To determine the appropriate model for data analysis, a model diagnostic test statistic was used. The Breaush Pagan LM Test is employed to select an appropriate model.

Table 4: Breush Pagan LM Test

	Cross-section	Test Hypothesis Time	Both
Breusch- Pagan	0.0639	5.3032	5.3672
	0.8004	0.0213	0.0205

Note: Results are drawn from EVIEWS- 12
H0: POLS is better than random effect model, select POLS(P> 0.05)

The table shows the result of the Breusch-Pagan test, and the p value is significant, so the null hypothesis is rejected at the 5% level of significance. It indicates that the pool's OLS is applicable to the data. The Breusch-Pagan test for ROE calculated the p value to be 0.8004, which is greater than the alpha of 0.05, implying that the pool OLS model is a better one.

Table 5: Results of pooled regression analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPL	-0.8824	0.4699	-1.8775	0.0625
LQ	0.2102	0.1004	2.0930	0.0381
LLP	-1.3308	1.3605	-0.9782	0.3296
CAR	-1.7513	0.3474	-5.0412	0
CRR	-0.0384	0.0573	-0.6706	0.5036
BS	0.2756	0.7744	0.3559	0.7224
C	31.151	10.3423	3.0120	0.0031
R-squared	0.193435			
Adjusted R-squared	0.159593	Durbin-Watson stat		1.191765
F-statistic	5.715851			
Prob(F-statistic)	0.000024			

Note: Results are drawn from EVIEWS- 12

The table no 5 shows the result of overall regression analysis. The result indicates19.34 percent variation in return on equity is explained by cash reserve ratio, capital adequacy ratio, liquidity ratio, bank size, non-performing loan ratio, and loan loss provision as explained by R^2.LR has a positive and significant relationship with bank profitability. It indicates that LR is also an important variable affecting the ROE of commercial banks in Nepal. Durbun Watson stat shows that above table 1.1917 it means less than 2 it shows positive autocorrelation. It indicates that LR is also an important variable affecting the ROE of commercial banks in Nepal. Keeping all the other factors constant, a 1 percent increase in LR leads to an increase in ROE of 0.2102 percent. LLP has a positive but insignificant relationship with bank profitability. Keeping all the other factors constant, 1 percent increase in LLP lead to an increase in ROE of 1.3308 percent. CRR has a negative and insignificant relationship with the ROE of commercial banks in Nepal, which is what is expected. Keeping the other factors constant, a 1 percent increase in CRR results in a 0.0384 percent decrease in ROE. CAR has a negative and significant relationship with ROE for commercial banks in Nepal, which is what is expected. Keeping the other factors constant, 1 percent increase in CAR results in a 1.7513 percent decrease in ROE. BS has a positive and insignificant relationship with the ROE of commercial banks in Nepal, which is what is expected. Keeping the other factors constant, 1 percent increase in BS results in a 0.2756 percent decrease in ROE. NPLs have a negative and insignificant impact on bank profitability. Keeping all other variables constant, the result on NPL was a 1 percent increase in NPL results in 0.8824 percent decrease in ROE.

Discussion

The analysis revealed that capital adequacy ratio (CAR) has negative impact on ROE of Nepalese commercial bank. So, this study shows negative result of ROE with CAR. Nepalese commercial bank has higher capital adequacy ratio which absorb credit losses by preventing the bank from financial loss. The finding is similar to previous researcher and they are Bhattrai (2014), Ogboi and Unuafe (2013) [40] and Wolday, E. (2015) [48]. Non-performing loan ratio has a statistically negative impact on profitability of Nepalese commercial bank. The finding proves that Nepalese commercial banks are weak to recover loan and advance from customers at the time mentioned in the agreement. The finding is similar to the previous researchers and they are Tuladhar (2017), Bhattrai (2014), Kaaya and Pastory (2013) and Opoku (2016). Bank size (BS) has a positive

relationship with the financial performance of Nepalese commercial banks. This finding is what is expected and to the finding of Bhattarai (2014) [9] but contradictory to that of Abdelrahim (2013). This result is consistent with the hypothesis that larger Nepalese commercial banks are able to make more profit.

Liquidity ratio (LR) has a positive and a significant relationship with the financial performance of Nepalese commercial banks. A number of empirical studies based on the relationship between the liquidity ratio and bank profitability showed mixed results. Abdelrahim (2013) found a strong and significant positive impact of LR on bank performance, whereas Adeusi *et al*. (2014) [2] and Ogboi and Unuafe (2013) [40] found a negative effect of LR on the financial performance. Bhattarai (2014) [9] has found that the cash reserve ratio has a inverse impact on bank profitability. From this study and the evidences, CRR is matched. The analysis revealed that loan loss provision ratio has negative relationship on the ROE of Nepalese commercial banks. The finding is similar to previous researcher and they are Thapa (2016) and Pradhan and Shrestha (2017).

The findings of the study indicates that the commercial banks have a good credit risk management practice which are evidence by the significant result for CAR and LR. The overall result shows that the credit risk management is an important predictor for the profitability of banks. Therefore, the success of the bank in term of profitability depends on its credit risk management.

Conclusion and Implications

The study was conducted to assess the effect of credit risk exposures on Bank profitability. Explanatory variables include: CAR, CRR, LQ, NPL, LLP, and BS, representing credit risk exposure. The study reveals that bank size and liquidity ratio have a positive impact on return on equity. The capital adequacy ratio also reveals a significant negative impact on return on equity. The study concludes capital adequacy ratio, and liquidity ratio have the greatest impact on the financial performance of sample commercial banks, while loan loss provision ratio, cash reserve ratio, and bank size have the least effect.

On the basis of the conclusion of this study, the following implications are mentioned for various people. This study is based on secondary data about credit risk management and its impact on profitability of Nepalese commercial banks. Most of the banks are facing number of risks on day to day activities such as credit risk, operation risk, market risk, liquidity risk, interest risk, foreign exchange risk. Among those risks which have been faced by banks, the credit risk plays the significant role on its financial performance.

In context of Nepal, commercial banks are facing difficulties over the past years due to the relaxed credit standard, poor portfolio risks management and loan approvals without proper examination which increases the non-performing loan. So, this study helps to find out the real problems in implementation of credit risk management for commercial bank in Nepal and it also helps in following areas.

- This study helps for Nepalese banking industry to insure that the effective strategy are being implemented to minimize risk for expanding market and financial return.
- Nepal Rastra Bank can utilize the findings of this thesis to formulate plan and policies for bank and financial institutions to reduce credit risk in the bank and financial sectors.
- At last, it would be important to all sample banks to know about the financial performance and condition of risk management.

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