Assessing the Impact of Credit Risk Management on Profitability of Commercial Banks in Nepal

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Abstract

This study aims to examine how the credit risk management influence on profitability of commercial banks in Nepal. The study was based on descriptive and causal comparative research design to address the issues of credit risk and performance of commercial banks. This study was based on secondary data and quantitate data in nature. There were 20 commercial banks operating in Nepal. So, all the commercial banks were used population for the study. Therefore, the sample size for this study were selected three commercial banks such as Nepal Bank Limited (NBL), Nabil Bank Limited (NABIL) and Kumari Bank Limited (KBL) as a sample bank from population using random sampling by lottery method. The secondary sources of data were collected from 2014/15 to 2023/24. The published financial statements of the sample commercial bank in Nepal as the recent fiscal year reported in the respective commercial bank's website. This study was used descriptive analysis, correlation and multiple regression analysis during the study period using MS Excel 20 and SPSS version 26 software. The finding of the study revealed that NPLs illustrates that significant negative effect on return on assets (ROA). CAR showed a negative but statistically insignificant relationship with ROA. The credit to deposit ratio (CDR) was found a significant negative effect on ROA. The cash reserve ratio (CRR) demonstrated a positive but statistically insignificant relationship with ROA.NABIL bank demonstrated the sound financial performance and stability among the sampled commercial banks. The implication of the study emphasized the need for credit assessment procedures, continuous borrower monitoring and loan recovery mechanisms to control non- performing loans (NPLs). Future directions for research could be additional bank-specific factors such as bank size, leverage, cost to income ratio of development banks on profitability in Nepal.

Keywords: Capital adequacy ratio, credit risk management, return on assets, credit deposit ratio, cash reserves ratio,

Introduction

Modern banks the world's highest financial organizations, with branches and affiliates in everyone's life. Some a variety of differences between bank types. The greater part of this differentiation is product and service-based offered by banks (Howells & Bain, 2008). Commercial banks, for example, take deposits, consolidate them into loans, and work with payment systems. Banks provide the economy with necessary capital through advances and loans. However, there exists a chance that these loans are not going to be paid within time, and this is called credit risk. Risk is the threat of harm, injury, liability, loss, or any other unfavorable occurrence as a result of internal or external factors. Banking sector plays vital role for economic development of a nation through the mobilization of savings and providing credit to borrowers. However, Nepali people are limited financial literacy, collateral-based lending exposure to economic shocks and regulatory changes by Nepal Rastra Bank (NRB). Commercial banks should consider each credit's risk/reward trade-off and the profitability of it. Coyle (2000) refers to credit risk as losses due to the inability of credit customers to pay in time and in full. It arises mainly owing to direct lending as well as some off-

balance sheet items i.e. guarantee, letter of credits, foreign exchange, forward contracts and assets in the form of debt securities held by the bank and derivatives. When borrower's asset values exceed their indebtedness, they repay loans but when borrowers assets values are less than loan values, they do not repay and they could, therefore, exercise their option to default (Sinkey, 2000). The commercial banks need to collect information about borrowers whose assets are in their portfolios and to monitor those borrower overtime (Saunders & Cornett, 2000). The flexible credit rationing policy can also be a source high NPLs rate in the highly competitive banking environment of today's world. Therefore, it is clear that why commercial banks need to manage credit risk mainly from NPLs (Juliana, 2017). Poudel (2018) investigated that credit risk illustrates a significant negative effect on the profitability of commercial banks in Nepal. However, the solvency ratio, interest spread rate, and inflation show a negative but statistically insignificant influence on profitability. Conversely, the capital adequacy ratio, total assets, and GDP growth have a significant positive influence on the profitability of these banks. Lastly, the inter-bank interest rate displays a positive influence on profitability it is statistically insignificant.

In recent years, the Nepali banking sector has significant challenges in maintaining profitability increasing credit exposure and loan defaults. The credit expansion is a major source of income for commercial banks, it also introduces credit risk primarily through non- performing loans (NPLs), inadequate loan provisioning and poor borrower evaluation. The quality of a bank's assets is exposure to certain risks, trends in non-performing loans, quality and profitability of its borrowers. The study research problem total assets and total loan and advance have positive on Nepalese commercial banks' profitability. Total equity was also shown to have no significant impact and deposit having a negative significant impact on profitability of commercial banks. Despite the empirical studies, this study concerned the research questions in the context of Nepali commercial banks. In Nepal, commercial banks are often exposed to high credit risks due to concentration of loans in real estate, trading and poor credit appraised systems. Non- performing loans are rising in Nepali economy. NPLs ratios which negatively influence profitability and liquidity. As a result, profitability pressures influence economic slowdown, interest rate volatility and market competition among the commercial banks. Therefore, profit margins have reduced. The research questions were as follows; What was the status of credit indicators and profitability of sampled commercial banks during the study period? Does there exists the relationship between credit indicators and the profitability of sampled banks? What is the impact of credit risk on the profitability of sampled commercial banks? The purpose of the study is to assess how credit risk management influence the profitability of commercial banks in Nepal. The specific purposes were to assess the status of credit indictors and profitability of sampled commercial banks, to analyze the relationship between credit performance and profitability of sampled commercial banks and to examine the impact of credit risk on the profitability. The credit risk includes non-performing loans (NPLs). Capital adequacy ratios (CAR), cash reserves ratio (CRR) and credit deposit ratio (CDR). Furthermore, the profitability measures return on assets and return on equity of commercial banks. However, this study focuses ROA as the profitability and four credit indicators (NPLs, CAR, CRR and CDR). The study examined the addressed a research gap by analyzing the credit risk approaches of NBL, NABIL, and KBL during the study period. It focused on key indicators such as non-performing loan ratio, capital adequacy ratio, cash reserve ratio, and credit deposit ratio. This study provides how effective credit risk management influences banks' financial stability and performance in Nepal. Niraula and Maharjan (2024) investigated that CAR and CDR were taken as the indicators of credit risk management whereas consumer price index, base rate and GDP growth rate were taken as elements of macroeconomic variables. This study revealed that a negative impact of NPLs on the profitability of commercial banks. Similarly, the study found that a positive impact of CAR and negative impact of CDR on profitability. Poudel (2012) examined that there was statistically negative relationship between ROA and CAR. Furthermore, NPLs, CAR, and CDR were used as indicators of credit risk management. The study revealed that there was statistically significant relationship between NPLs and CAR with profitability of commercial banks. However, there was insignificant relationship between CDR and profitability of Nepali commercial banks (Parajuli, 2024). Chhetri (2021) investigated that the non-performing loan ratio (NPLR) negatively and significantly affects

financial performance, measured by ROA. In contrast, the capital adequacy ratio (CAR) and bank size (BS) showed a negative but statistically insignificant influence on ROA. Furthermore, the credit-to-deposit ratio (CDR) revealed a positive insignificant relationship with financial performance measured by ROA. The hypotheses of the study are as follows;

H1: Non-performing loan ratios has a significant and negative effect on ROA of commercial banks in Nepal.
H2: Capital adequacy ratio has a significant and positive effect on ROA of commercial banks in Nepal.
H3: Credit to deposit ratio has a significant and positive effect on ROA of commercial banks in Nepal.
H4: Cash reserves ratio has a significant and negative effect on ROA of commercial banks in Nepal.

Review of Literature
Credit risk theory also implies that default risk of loans significantly influences the profit of a bank. Credit risk is quantified by the ratio of non-performing loans (NPLs), which represents the percentage of loans in or in the process of defaulting. As there are greater NPLs of a bank, the bank has to invest more resources in order to absorb potential losses arising from defaults using loan loss provision. These provisions reduce net income, which in turn diminishes the profitability of the bank (Tan et al., 2017). Credit is the sum of money that a creditor (bank) lends to a borrower (customer), either with or without security (Vasudevan & Radhaswamy,1979). According to Santomero (1997) investigated that the presence of CRM limits the probability of losses by reducing risks that does not bring reasonable return. Credit risk management is an essential element of a bank's financial position. Financial intermediation theory state that banks act as intermediaries between savers and borrowers, mobilizing their deposits into productive loans. CDR and CRR measure how effectively commercial banks transformed deposits into loans and advances and manage their liquidity (Gurley & Shaw, 1960). Similarly, commercial banks must hold sufficient capital buffers to absorb unexpected losses. Higher capital adequacy enhances economic stability which can indirectly support profitability ((Berger, 1995). CAR measures a bank's ability to manage credit shocks. Therefore, adequate capital reduces insolvency risk and lower funding costs. ROA shows the effectiveness of a bank's management in earning profits at the level of available assets. Non-performing loan (NPLs) can be defined as the non-productive assets of the banks. Generally, the loan, which does not repay within three months, is known as nonperforming loans (Dahal & Dahal, 2002). Capital adequacy is the level of capital required by the banks to enable them withstand the risks. Capital adequacy ratio is directly proportional to the resilience of the bank to crisis situations (Dahal & Dahal, 2002). Afriyie and Akotey (2013) demonstrated that the existence of a significant positive relationship between non-performing loans and bank profitability meaning that even though there is huge loan default, non-performing loans are increasing proportionately to profitability. Yeasin (2022) investigated that there is a significant negative relationship between non-performing loans, capital adequacy ratio, and financial performance of commercial banks in Bangladesh. However, the relationship between loans-to-deposit ratio and financial performance of commercial banks is to be positive.

Maharjan (2020) claimed that capital adequacy ratio, non-performing loan, loans, and advances to deposit ratio, loan loss provision ratio and profitability measures on ROA and ROE. This study concludes that NPL has inverse but insignificant impact on profitability however, CAR and loan loss provision have positive significant impact. Jain and Sangeetha (2021) examined the consequence of credit risk management on the financial performance of commercial banks. The study has significant positive impact on financial performance indicators like return on assets and returns on equity. Kwashie et al. (2022) claimed the impact of credit risk on financial performance measured by ROA of 15 commercial banks in Ghana from 2013 to 2018. It includes NPL, CAR, loan and advances as credit risk variables and bank size, bank's age, GDP, inflation, monetary policy rate as control variables. The result found that NPL negative significant, CAR and loans and advances ratio have positive effect on bank's performance. The study's findings show that non-performing loans (NPLs) significantly hinder bank performance and the growth of total assets in Nepal. Variables such as credit to deposit ratio, non-performing loans, and inflation were found to be statistically significant predictors of commercial banks' growth. Furthermore, this study highlighted that credit management practices in Nepalese commercial banks remain below optimal standards (Humagain,2023).

Sigdel and Deswal (2023) investigated that rising NPLs lower the profitability of Nepali commercial banks. Conversely, the credit to deposit ratio has a significant negative impact. An increase in CAR and interest spread rate enhances bank profitability. Similarly, GDP growth rate has a positive but statistically insignificant influence on ROA. Prior studies investigated that non-performing loans (NPLs) and credit to deposit ratios (CDR) are the determinants of commercial banks financial performance in Nepal (Chhetri, 2021; Humagain, 2023; Sigdel & Deswal, 2023). CAR has a negative and statistical insignificant relationship with ROA. Profitability increases with interest spread rate increased while base rate has a significant negative impact. As a result, credit risk reduces the ROA (Kalwar & Shrestha, 2024). Isanzu (2017) investigated the effect of credit risk on the financial performance of Chinese banks. Secondary data were gathered from the five largest commercial banks in China over a seven-year period (2008–2014). Credit risk was assessed using non-performing loans, capital adequacy ratio, impaired loan reserves, and loan impairment charges, while return on assets (ROA) was used to measure financial performance. Result showed that both non-performing loans and capital adequacy significantly influence the financial performance of Chinese commercial banks. Tuladhar (2017) suggested that credit risk management significantly affects the profitability of Nepalese commercial banks. The coverage ratio, capital adequacy ratio, and bank size positively influence bank performance, whereas leverage ratio, non-performing loan ratio, and the presence of female board members negatively affect their profitability. Furthermore, liquidity ratio, asset quality, and cash reserve ratio were found to have no significant influence on bank performance. Bhattarai (2016) investigated that the non-performing loan ratio negatively affects bank performance, while cost per loan assets has a positive influence. Furthermore, bank size positively influences bank performance. However, capital adequacy ratio and cash reserve were not found to significantly affect bank performance. Pandey and Joshi (2023) examined that the impact of credit risk management on the profitability of Nepalese commercial banks. The beta coefficients for default rate and cost per asset in relation to profitability (ROA and ROE) were negative and statistically significant. Conversely, the beta coefficient for capital adequacy ratio was positive and significant, showing a statistically positive relationship between capital adequacy and bank profitability. The findings of the study capital adequacy ratio, non-performing loans, cost-to-income ratio, and loan loss provisions negatively and significantly affect the profitability of commercial banks. On the other hand, the leverage ratio shows a significant positive influence, but only on return on equity (Poudel et al.,2024). The fixed effects model results that increased capital adequacy ratio and larger bank size statistically significantly enhance profitability. However, a higher proportion of NPLs has a negative influence on ROE (Dahal & Dhungana, 2025).

Research Methodology
The study was based on descriptive and causal comparative research design to address the issues of credit risk and performance of commercial banks. Descriptive research design was used for describes the financial figures and facts of commercial banks in Nepal. Furthermore, this study used a causal comparative research design to examine impact of explanatory variables on return on assets of Nepali commercial banks. This study is based on secondary data and quantitate data in nature. There were 20 commercial banks operating in Nepal. So, all the commercial banks are population for the study. Therefore, the sample size for this study were selected three commercial banks such as Nepal Bank Limited (NBL), Nabil Bank Limited (NABIL) and Kumari Bank Limited (KBL) as a sample bank from population using random sampling by lottery method. The secondary sources of data were collected from 2014/15 to 2023/24. The data was quantitative in nature. The published financial statements of the sample commercial bank in Nepal as the recent fiscal year recorded in the respective bank's website. This study is based on secondary data collection from the bank's website and published annual reports of sampled commercial banks. This study was used descriptive analysis, correlation and multiple regression analysis during the study period by using MS excel and SPSS 26 software. Model specification presented as follows;

$$ROA_{it} = \beta 0 + \beta_1 CRR + \beta_2 NPL + \beta_3 CAR + \beta_4 CDR + et$$

Where ROA = Return on assets, CRR = Cash reserve ratio, NPL = non-performing loan

CAR = Capital adequacy ratio CDR = Credit deposit ratio
   β_0= Constant, $\beta_1, \beta_2, \beta_3$ and β_4 are coefficient parameters of explanatory variables
   et= Error term

 Based on empirical studies, the dependent variable is ROA measures profitability of commercial banks. Similarly, major credit risk indicators are credit deposit ratio (CDR), non-performing loan (NPL), capital adequacy ratio (CAR) and cash reserve ratio (CRR). So, the conceptual framework for this study presented

Conceptual Framework, **Fig 1**

Independent Variables   Dependent Variables
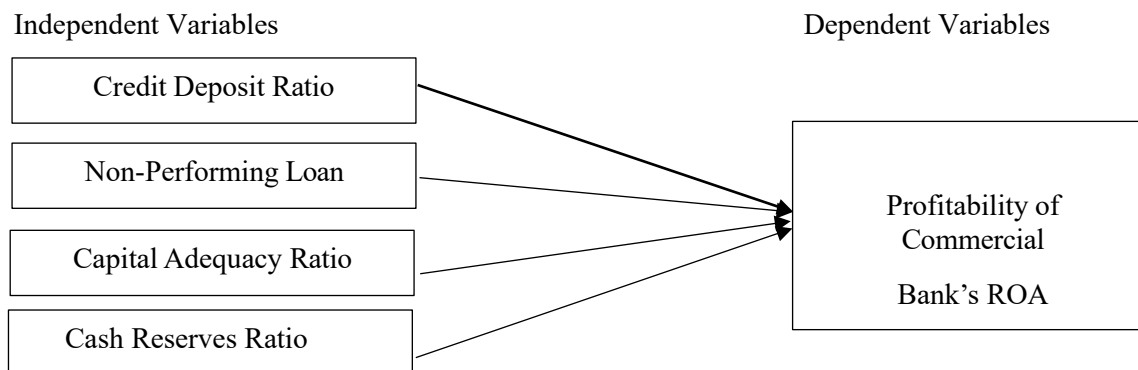
 Adapted from Bhattrarai (2016) and Parajuli (2023)

A conceptual framework illustrates that relationship between the independent variables and dependent variables. Return on assets (ROA) is an indicator of how profitable a company is relative to its total assets' utilization. It provides a manager, investor, and market analyst an idea as to how efficient a bank's management used their assets to generate earning. Credit deposit ratio is used to assess a bank's credit risk as well as liquidity by comparing a bank's total loans to its total deposits for the study period. A nonperforming loan (NPL) is amount of borrowed money upon which the debtor has not made the scheduled payments for a period of time. Capital adequacy ratios are a measure of the amount of a bank's capital expressed as a percentage of its risk weighted credit exposures. Furthermore, cash reserve ratios were distributed according to the cash reserve bank's standards based on liquidity. It is the ratio of a commercial bank's total deposits that must be a reserve in the form of cash with the central bank as Nepal Rastra Bank.

Result and Analysis
The return on equity (ROE) ratio which is also known as the return on net worth is used by investors to determine the amount of return they are receiving from their capital investment. Return on assets (ROA) is a financial ratio that shows the percentage of profit that a company earns in relation to its overall resource's total assets.

Table 1: Return on Equity and Return on Assets of Sampled Commercial Banks

Years	Return on Equity (%)			Return on Assets (%)		
	NBL	NABIL	KBL	NBL	NABIL	KBL
2014/15	0.00	22.73	0.00	2.00	2.06	1.06
2015/16	0.00	25.61	0.00	2.06	2.32	1.69
2016/17	7.57	22.41	0.00	2.13	2.69	1.29
2017/18	13.99	20.94	0.00	2.41	2.61	1.26
2018/19	8.87	17.76	7.08	1.51	2.11	1.17
2019/20	7.87	13.61	5.71	1.22	1.58	0.76
2020/21	9.36	15.19	4.00	1.33	1.71	1.04
2021/22	8.51	9.78	9.44	1.12	1.20	1.22

2022/23	9.55	11.66	1.47	1.81	1.42	0.14
2023/24	0.08	10.72	0.013	0.01	1.19	0.00
Mean	6.58	17.04	2.77	1.56	1.89	0.96
SD	4.85	5.65	3.55	0.69	0.55	0.53
CV	0.74	0.33	1.28	0.44	0.29	0.55

Note: *Annual Reports of Sampled Banks.*

Table 1 illustrates the return on equity ratio of NBL, NABIL and KBL. The highest ROE of NABIL is 25.61 in 2015/16 and the lowest ROE of KBL is 0.00 in 2023/24. the highest mean is 17.04 of NABIL Bank. Therefore, the NABIL Bank is better based on mean whereas KBL has lowest value 2.8 which is poor. The CV of NABIL is 0.33 which better than other sampled banks and the CV of KBL was 1.28 which is not good. Therefore, NABIL bank performed better than another sampled commercial bank. Similarly, the highest ROA of NABIL is 2.69 in 2016/17 and the lowest ROA KBL is 0.00 in 2023/24, the highest mean is 1.89 of NABIL Bank. Therefore, the NABIL bank is better according to the mean whereas KBL has lowest value 0.96 which is low. The CV of NABIL is 0.29 which better than NBL and KBL. Hence, NABIL is better than NBL and KBL.

Table 2: Non- Performing Loan and Capital Adequacy Ratio of Sampled Commercial Banks

Years	Non-Performing Loan (%)			Capital Adequacy Ratio (%)		
	NBL	NABIL	KBL	NBL	NABIL	KBL
2014/2015	3.98	1.82	2.49	7.49	11.57	10.84
2015/2016	3.11	1.14	1.15	10.20	11.73	11.69
2016/2017	3.32	0.80	1.86	14.47	12.90	14.50
2017/2018	3.37	0.55	1.05	11.27	13.00	13.36
2018/2019	2.64	0.74	1.01	16.80	12.5	11.75
2019/2020	2.47	0.98	1.39	17.01	13.07	15.35
2020/2021	2.05	0.84	0.96	16.80	12.77	13.71
2021/2022	1.83	1.62	1.11	15.05	13.09	12.63
2022/2023	2.85	3.39	4.96	13.74	12.54	12.11
2023/2024	4.33	4.45	5.96	14.49	12.24	11.42
Mean	2.99	1.63	2.19	13.73	12.54	12.74
SD	3.28	1.27	2.41	3.16	0.62	1.46
CV	1.09	0.78	1.100	0.23	0.05	0.11

Note: *Annual Reports of Sampled Banks.*

Table 2 illustrates the non-performing loan ratio of NBL, NABIL and KBL The highest NPL of KBL is 5.96 percent in fiscal year 2023/24 and the lowest NPL of NABIL is 0.55 percent in year 2017/18, the highest mean is 2.99 percent of NBL. So, the NABIL bank is better based on the mean whereas NBL has the highest value 2.99 percent which is poor. The CV of NBL is 1.09 which poor than KBL and NABIL bank. Similarly, based on CAR, the highest CAR of NBL is 17.01percent in fiscal year 2019/20 and the lowest CAR of NBL is 7.49 percent in year 2014/15. The highest mean was 13.73 of NBL bank. The average capital adequacy ratio of NBL, NABIL, and KBL Bank are 13.73 percent ,12.54 percent and 12.736 percent which indicates that all sample commercial banks have maintained a rate as set by NRB and they have adequate capital during the study period. According to NRB, the minimum capital adequacy ratio 11.5 percent has to be maintained by all sampled commercial banks. The CV of NABIL is 0.05 which better than KBL and NBL Bank. Therefore, NABIL bank is better than NBL and KBL bank

Table 3: Cash Reserve Ratio and Credit Deposit Ratio of Sampled Commercial Banks

Years	Cash Reserve Ratio (%)	Credit Deposit Ratio (%)

	NBL	NABIL	KBL	NBL	NABIL	KBL
2014/2015	11.55	14.15	7.48	68.45	64.43	81.00
2015/2016	17.46	6.77	8.74	71.05	70.49	79.34
2016/2017	18.81	10.02	10.33	79.17	65.38	87.60
2017/2018	9.05	10.02	6.85	75.68	82.66	89.55
2018/2019	4.06	4.19	4.59	78.14	81.96	90.11
2019/2020	4.53	11.2	3.78	72.25	79.72	92.19
2020/2021	4.19	3.66	3.72	82.76	89.84	90.99
2021/2022	3.49	4.13	3.78	86.97	92.49	86.58
2022/2023	7.97	6.89	4.10	72.65	84.19	86.03
2023/2024	4.00	4.31	30.47	72.99	83.60	79.59
Mean	8.51	7.54	8.38	76.01	79.48	86.29
SD	5.88	3.63	8.11	5.74	9.65	4.77
CV	0.69	0.48	0.97	0.08	0.12	0.06

Note: *Annual Reports of Sampled Banks.*

Table 3 illustrates the cash reserve ratio of NBL, NABIL and KBL. The highest CRR of KBL is 30.47 percent in fiscal year 2023/24 and the lowest CRR of NBL is 3.49 percent in year 2021/22. The CRR highest mean is 8.51 percent of NBL. According to NRB, the minimum cash reverse ratio of 4 percent has to be maintained by commercial banks. The average cash reverse ratio of NBL, NABIL, and KBL Bank are 8.51, 7.54 and 8.38 percent respectively. It means that all sampled commercial banks have maintained a rate as stated by NRB and they have CRR on hand during the study period. However, among the sampled commercial banks, NABIL Bank has been able to maintain better CRR as compared to NBL and KBL. The CV of NABIL is .48 which less than NBL and KBL bank. Therefore, NABIL bank is better than NBL and KBL bank according to CRR. Similarly, the CDR illustrates of NBL, NABIL and KBL. The highest CDR of NABIL is 92.49 percent in fiscal year 2021/22 and the lowest CDR of NABIL is 64.43 percent in year 2014/15. The highest mean is 86.29 percent of KBL Bank. Therefore, the KBL Bank is better based on mean whereas NBL has lowest value 76.01percent. The CV of KBL is 0.056 which better than NBL and NABIL bank.

Table 4: Descriptive Analysis of Variables of Sampled Commercial Banks (n = 30)

Variables	No of Observation	Mean	Standard Deviation	Minimum	Maximum
ROE	30	8.79	7.67	.00	25.61
ROA	30	1.47	.695	.00	2.69
CRR	30	8.14	5.91	3.49	30.47
NPL	30	2.27	1.43	.55	5.96
CAR	30	13.003	2.03	7.49	17.01
CDR	30	80.59	8.07	64.43	92.49

Note: *Author Calculation*.

Table 4 illustrates the average ROE 8.79 percent during the study period. It means that on return on equity of sampled commercial banks in Nepal earns 8.79 percent. The standard deviation of return on assets (ROA) is .695 which show the lack of substantial variation. The result illustrates that the cash reserve ratio is 8.14 percentage and minimum value of cash reserve ratio is 3.49 percent and maximum value of CRR was 30.47. The non-performing loan ratio among the sample commercial banks in Nepal is varied from .55 to 5.96 percent with the mean and standard deviation 2.27 percent and 1.43 percent respectively which indicates volatility among the banks' ability in credit risk management. The minimum capital adequacy ratio is 7.49 percent that is lower than regulatory requirement of 11 percent and maximum CAR was 17.01 percent that

is greater than mandatory CAR 11percent as set by NRB. The minimum value of CDR is 64.43 percent and maximum value was 92.49 percent.

Table 5: Relationship Among Credit Indicators and Profitability of Sampled Commercial Banks

Variables	CDR	CAR	ROE	ROA	CRR	NPL
CDR	1					
CAR	.262	1				
ROE	-.284	.051	1			
ROA	-.443*	-.223	.644**	1		
CRR	-.387*	-.367*	-.132	.086	1	
NPL	-.239	-.195	-.452*	-.479**	.419*	1

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

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

Table 5 illustrates that the correlation matrix among the study variables; CDR, CAR, ROE, ROA, CRR and NPLs. The results revealed that CDR is negatively and significantly correlated with ROA $(r = -.443, p < .05)$ and CRR $(r = -.387, p < .05)$. It means that higher credit expansion is related with lower returns on assets and reduced cash reserves. CAR demonstrates that weak and insignificant correlations with all variables. As a result, there was limited influence in this dataset. ROE shows a strong positive and significant correlation with ROA $(r = .644, p < .01)$ which shows both the profitability measures. Furthermore, ROE has a significant negative correlation with NPL $(r = -.452, p < .05)$. implying that higher levels of non-performing loans reduce shareholders' returns. Similarly, ROA is negatively and significantly correlated with NPL $(r = -.479, p < .01)$. It demonstrates that poor loan quality adversely affects asset profitability. CRR is positively and significantly related with NPL $(r = .419, p < .05)$ however, negatively correlated with CDR and CAR. It means that commercial banks with higher non-performing loans maintain higher reserves while reducing lending and CAR.

Table 6: Impact of Credit Risk on Return on Assets of Sampled Commercial Banks

Variable	Dependent variable ROA				
	Coefficients	Standard Error	t Stat	P-value	VIF
Constant	6.520	1.150	5.667	.001	
CRR	.012	.018	.687	.498	1.461
NPL	-.331	.068	-4.896	.001	1.225
CAR	- .062	.047	-1.332	.195	1.181
CDR	-.045	.012	-3.740	.001	1.208

$R^2 = .605$, Adjusted $R^2 = .541$, F-stat= 9.557, P-value = 0.001<0.01
Note: *Author Calculation.*

Table 6 illustrates that the regression model was to examine the impact of credit risk indicators on the profitability of commercial banks which measured by ROA as the dependent variable. The model illustrates that a good fit with R² value of 0.605. It means that 60.5 percent of the variation in ROA is explained by the credit risk indicators as independent variables. Furthermore, the adjusted R² of confirmed the model explanatory power. The F-statistic $(4,25) = 9.557, p < .01$) revealed that the model is statistically significant that the explanatory variables jointly have a significant consequence on bank ROA. Among the independent variables, CRR has a positive but statistically insignificant relationship with ROA ($\beta1 = .012, p = .498$). This suggests that variations in CRR do not significantly influence bank profitability within the study period. The NPLs ratio exhibits a negative and highly significant influence on ROA ($\beta2 = -.331, p < .001$). This means that higher levels of NPLs substantially reduce banks ROA. The CAR has a negative but statistically insignificant with coefficient ($\beta3 = -.062, p = .195$). As a result, the CAR did not play a significant role in determining ROA in the sampled commercial banks. Similarly, the CDR demonstrates that a significant negative influence on ROA ($\beta4 = -.045, p < .001$). It means that excessive lending relative to deposits which have reduce ROA due to inefficiencies in fund utilization. Furthermore, the VIF values for all explanatory variables are below the threshold of 5. Therefore, there was no multicollinearity problem in the estimated regression model.

Discussion
This study examined the impact of credit risk indicators on the profitability of Nepali commercial banks. It includes non-performing loans (NPLs), capital adequacy ratio (CAR), cash reserve ratio (CRR) and credit to deposit ratio (CDR). The regression results revealed that NPLs illustrates that significant negative effect on return on assets (ROA). This is consistent with prior studies (Chhetri, 2021; Dahal & Dhungana, 2025; Sigdel & Deswal, 2023; Tan et al., 2017). Furthermore, the correlation analysis confirmed that higher NPL are associated with lower ROA ($r = -.479, p < .01$) and ROE ($r = -.452, p < .05$). As a result, poor asset quality reduces ROA through increased loan loss provisions. These findings accepted H1and need to monitoring and managing non-performing loans for financial stability. On the other hand, the theoretically perspective capital adequacy ratio (CAR) expected to positively affect profitability (H2). It showed a negative but statistically insignificant relationship with ROA. As a result, it is not support H2. This finding is inconsistent with studies by Jain and Sangeetha (2021) and Kwashie et al. (2022), which reported a positive significant influence of CAR on ROA of commercial banks. However, it concerned with Poudel (2012) and Bhattarai (2016), who found a negative relationship between CAR and ROA in the Nepali context. This inconsistency can reflect the dynamics of Nepali commercial banks. The regulatory capital adequacy cannot transform into improved short-term profitability but it serves more as a buffer against financial risks. The credit to deposit ratio (CDR) was found to have a significant negative effect on ROA. It contradicts the expected positive relationship hypothesis H3. This finding contrasts with prior studies (Yeasin, 2022; Chhetri, 2021) however, it is consistent with Sigdel and Deswal (2023) that suggested higher lending relative to deposits improve their profitability. Therefore, the negative relationship demonstrated that an aggressive lending that increases exposure to default risk. The cash reserve ratio (CRR) demonstrated a positive but statistically insignificant relationship with ROA. As a result, it is not supported by H4. However, financial intermediation theory (Gurley & Shaw,1969) suggested that higher CRR, lower funds available for lending activities and the lower ROA of commercial banks. Therefore, the statistically insignificant relationship means that variations in cash reserve ratio were not a main determinant of ROA of commercial banks during the study period. The positive correlation of CRR with NPLs (r = .419, p < .05) suggests that banks with higher non-performing loans maintained higher reserves as a precautionary motive, consistent with risk-averse banking behavior.

Conclusion and Implications

This study assessed the impact of credit risk management on profitability of commercial banks in Nepal. NABIL bank has better than NBL and KBL in terms of return on equity (ROE) and return on assets (ROA). Furthermore, NABIL bank has lower non-performing loans ratio (NPLs) in the terms of credit risk management and higher cash reserve ratio (CRR) with lower variability. All sampled commercial banks have met NRB's regulatory requirements for capital adequacy ratio (CAR) and cash reserve ratio (CRR). KBL had the highest average CDR among the sampled commercial banks. The researcher concluded that there was more efficient utilization of deposits in generating loans and advances. KBL performed that better in terms of average CDR management instead of NABIL and NBL. However, KBL showed lower ROE and ROA and higher default risk exposure. In conclusion, NABIL bank demonstrated the sound financial performance and stability among the sampled banks. Non-performing loans significantly reduce the profitability (ROA) of commercial banks in Nepal. As a result, it makes that determined the ROA in credit risk management. Capital adequacy ratio (CAR), and cash reserve ratio (CRR) do not statistically significant influence on ROA of commercial banks. It suggested that the regulatory capital and liquidity requirements could not sure to improve the return on assets (ROA). Credit to deposit (CDR) negatively influences on ROA. It indicates that excessive lending relative to deposits can be reduce the profitability of commercial banks due to higher default risk exposure and external economic factors in Nepal. The researcher concluded that effective monitoring of NPLs and lending practices are required for enhancing financial stability and profitability of commercial banks in Nepal. The implication of the study emphasized the need for credit assessment procedures, continuous borrower monitoring and loan recovery mechanisms to control non-performing loans (NPLs). Commercial banks can be optimizing the credit to deposit (CDR) to manage the lending activities with credit risk exposure. Nepal Rastra Bank (NRB) could continue undertake the capital adequacy and liquidity norms while credit evaluation standards. Future directions for research could be additional bank-specific factors such as bank size, leverage, cost to income ratio and their interaction with credit risk management of development banks on profitability in Nepal.

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