

Credit Risk and Profitability Position of Nepalese Private and Joint Venture Commercial Banks

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Abstract

Credit concentrations, credit processes and other externalities have made credit risk more important over the past decade, followed by liquidity issues. This study was conducted to compare the credit risk exposure of various banks in terms of their liquidity, capital ratio, size, operational inefficiency, loan growth rate, and non-performing loans. It also investigated the spontaneous relationship between credit risk and bank profitability. Secondary data of 5 years from ten banks (5 each from joint venture and private banks) have been collected. The descriptive and comparative study designs were employed and SPSS software was used for the analysis of data. The results showed that the private banks surpass joint venture banks in terms of capital ratio and operating efficiency, but joint venture banks lead private banks in terms of liquidity, capital ratio, total assets, loan growth rate, and non-performing loans. However, the independent sample t-test did not show any significant differences on liquidity, capital ratio, size, and loan growth rate. The Pearson's correlation showed positive associations of capital ratio (moderate and significant), operating inefficiency (weak and insignificant), and loan growth rate (weak and insignificant) with ROA. In contrast, bank size and nonperforming loans have significant moderate negative correlations, but liquidity is not found to be correlated with ROA. The empirical findings of this study are considered helpful in evaluating the comparative credit risk exposure of the banking sector and have both managerial and academic implications.

Keywords: credit risk, ROA, non-performing loan, liquidity, capital ratio

1. Introduction

The financial sector is crucial in the context of developing economies and serves as the foundation for socioeconomic development. All commercial and governmental activities are certain to be regulated by the financial sector's stability. Banks and other financial institutions are involved in managing a variety of hazards, including interest rate risk, market risk, operational risk, liquidity and financing risk, and credit risk. Credit risk is mostly derived from loans, but there are other sources throughout a

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financial institution's operations, such as the trading book and both on and off the balance sheet (Nepal Rastra Bank [NRB], 2018). Thus, one of the main dangers connected to financial institutions that actively offer a range of credits in the form of loans and advances is credit risk. According to Basel Committee on Banking Supervision (Basel, 2000), credit risk is the possibility that a debtor or counterparty won't fulfill a contractually stipulated obligation in accordance with the agreed-upon terms. It is the loss brought on by credit customers' refusal to pay their debts in full and on time or their inability to do so.

Kolapo et al. (2012) provided a comprehensive list of the major factors that contribute to high credit risk in this context, including poor management, ineffective loan policies, interest rate volatility, low capital and liquidity ratios, inadequate credit appraisal, improper lending procedures, poor lending underwriting, government intervention, and ineffective central bank regulation. An organized and integrated method for identifying, measuring, monitoring, and controlling credit risk offers protection from the detrimental effects of credit risk on the institution's financial stability.

A significant exposure to credit risk results in financial losses and the possibility of financial instability, which might jeopardize the financial institution's capacity to continue operating and to generate revenue. Such detrimental effects could jeopardize the soundness of particular financial institutions and jeopardize the stability of the entire financial system as a result of inadequate risk assessment and management (NRB, 2018). Therefore, a fundamental concern for management of financial institutions is managing credit risk.

Effective credit risk management is essential to financial organizations' long-term viability. Since credit risk is the biggest threat to banks and has a substantial impact on their ability to conduct business, Giesecke (2004) affirmed the importance of accurate measurement and effective management of credit risk. The goal of credit risk management in financial institutions is to keep credit risk exposure within appropriate and acceptable ranges. A thorough approach to risk management must include the efficient management of credit risk (NRB, 2018). Due to their crucial role on profitability, credit performance and capital adequacy are subject to critical analysis and assessment regarding their effect on profitability performance of banks (Shrestha & Niraula, 2021).

The management of credit risk influences credit decisions, aids in preserving overall credit quality, and influences the banks' capacity to make a profit (Li & Zou, 2014). According to Bhattarai (2016), effective credit risk management dynamics lead to the commercial banks' financial stability. Lack of analysis of borrower defaults causes earnings to fluctuate, which exposes banks to an additional risk of profit volatility.

Research Issues and Objectives

Since last 10 years, the commercial banking industry in Nepal has experienced persistent liquidity problems resulting to increased interest rates and inflation. COVID-19 pandemic and other socio-economic issues provided more difficulties in managing credit risk and liquidity. The monetary policies of the central bank have addressed the issues. However financial sector still faces difficulties. The Credit risk problems are said to be caused by credit concentrations to a small number of borrowers, credit flow to the real estate industry and other unproductive sectors, problems in loan application procedure, and macroeconomic variables primarily. Bhattarai (2016) recognized the Nepalese commercial banking sector's deficient portfolio risk management, lax credit standards for counterparties and borrowers, and shifting environmental conditions as sources of credit risk exposures.

The commercial banks lead the financial industry in Nepal, and therefore the management of credit risk issues contribute for stable financial sector. In addition, Credit risk issues subsequently have an impact on their operational competitiveness, liquidity, performance, and other economic aspects of the Nepali economy as it stands today. A considerable volume of past studies is conducted to determine effect of credit risk factors on profitability. There is a gap of studies involving evaluation comparative credit risk exposure between two or more groups of banks. Thus, the issue of this study is on the credit risk standing of the private and joint venture banks and association between credit risk and profitability status. This study aims to examine the association of credit risk with profitability of private and joint venture banks in Nepal.

3. Literature Review

Sources of Credit Risk

An increased credit risk downfalls banks' operating and financial performance. A high level credit risk leads a bank to the liquidity and solvency situation. Tehulu and Olana (2014) argued that banks face a variety of risks from both internal and external sources, including ineffective managers, lax regulations, and harsh economic situations.

Basel (2000) outlined three major sources of credit problems. The first source of credit risks arises due to internal and external reasons. The internal reasons of credit risk are credit concentrations and issues on credit process. Credit concentrations are lenders weakness and the most significant cause of major credit problems. It is defined as any exposure where the potential losses are large relative to the bank's capital, total assets or the bank's overall risk level. Credit concentrations are of two types; the conventional credit concentrations where banks concentrations of credits to

single borrowers or counterparties, a group of connected counterparties, and sectors or industries, such as commercial real estate, and oil and gas (Basel, 2000).

The next concentrations are based on common or correlated risk factors. The second source of credit risk is issues prevailing in credit process. It arises due to weaknesses in the credit granting and monitoring processes which can be avoided or mitigated by a strong internal credit process. The lack of a thorough credit assessment, the absence of testing and validation of new lending techniques, subjective decision-making by senior management, lack of effective credit review process, failure to monitor borrowers or collateral values, and credit-related fraud expose credit risks pose high credit risk (Basel, 2000). The third external source is market and liquidity-sensitive credit exposures. The market-sensitive exposures include foreign exchange and financial derivative contracts. Whereas liquidity-sensitive exposures include margin and collateral agreements with periodic margin calls, liquidity back-up lines, commitments and some letters of credit and some unwind provisions of securitizations.

Theories of Credit Risk

Two theories are commonly used in the study of credit risk-credit risk theory and financial distress theory. The first credit risk theory is based on credit default. The default model by Merton (1977) became the dominant credit risk theory. This theory contends that the inability of borrowers to uphold their obligations to their banks has an impact on the capital structure of the banks and ties a firm's credit risk to its capital structure in terms of its equity and debt obligations. Weak operating and financial performance are a result of the uneven capital structure. Through the periodic issuing of guidelines and policy measures, the central banks are concerned with evaluating and controlling the banking credit status that leads to liquidity concerns. As credit intermediates, the main challenge facing banks is a credit default brought on by borrowers who are unable to pay back the loans they obtained from their banks.

The financial distress theory is the second credit risk theory. A bank's financial stability is a requirement for conducting banking operations, making the notion of financial distress essential. According to the theory, indicators of financial difficulty appear when banks fail to pay their debts by the due dates. The financial health of banks is also impacted by some risky situations, such as systemic shocks brought on by the occurrence of COVID-19 (Shabir et al., 2023) and inadequate risk and financial performance monitoring. The effects of credit default damage operational capacity, for example, making it impossible to service depositor withdrawal requests due to insufficient liquidity. This could eventually lead to a bank's failure by impairing its liquidity, cash reserve ratio, and capital adequacy ratio. Additionally,

the circumstance negatively impacts the depositor's competitiveness, image, and confidence. The bank will eventually become insolvent or bankrupt as a result of a credit default.

Empirical review

Ombaba (2013) concluded that the non-performing loans to total loan ratio, which is the most frequently employed by analysts, poses a serious threat to the banking system and adversely affects the profitability of the bank as a result of the bad loans. According to Suganya and Kengatharan (2018), operational cost-effectiveness and non-performing loans showed a negative profitability relationship whereas bank capital had a positive impact on bank profitability. Additionally, Ndoka and Islami (2016) discovered no link between adequate capital and the bank's profitability. The study of Bagale (2023) concluded that credit risk factors; bank size and liquidity ratio created positive impact on ROE but cash reserve ratio, capital adequacy ratio, loan loss provision ratio and non-performing loan ratio found to have negative impact on ROE in Nepali commercial bank.

Bhattarai (2016) concluded that there was a substantial correlation between bank performance and measures of credit risk. He presented inconsistent regression analysis results. He discovered that bank size and cost per loan assets had a positive impact on performance. Although non-performing loans had a detrimental impact on bank performance, capital adequacy ratio and cash reserves did not. Noor et al. (2018) found co-integration among the study variables- percent of classified loan (POCL) and profitability ratios. They revealed significant negative impact of POCL on ROI. The impact of POCL was not significant on ROA and ROE in the short run. But in the long run, there is significant impact of POCL on ROA and ROE.

Oke and Tiamiyu (2022) investigated mixed effect of credit risk variables on profitability. They reveal negative statistically significant effect of non-performing loan ratio and Loan loss provision on ROE. However, their findings suggest positive and significant effect of foreign currency ratio, net interest income ratio, and total assets on ROE. Cheng et al. (2020) evaluated association between bank risks in terms of credit risk, liquidity risk, and operational risk with bank profitability. They showed a significant positive association among bank profitability and credit risk (measured by non-performing loan ratio, capital adequacy ratio, and cost per loan). Li and Zou (2014) discovered a beneficial impact of credit risk management on commercial banks' profitability.

The empirical findings of Islam and Rana (2022) indicated that credit risk measured in terms of capital adequacy ratio, interest rate risk, and operation risk ratio, loan-to-deposit ratio, non-performing loans, GDP growth rate, and inflation rate influence the

profitability of commercial banks as measured by ROA, ROE, and NIM. The findings of Lalon (2015) showed a positive relationship between credit risk management practices and Banks profitability (ROA). Lew and Lau (2022) found credit risk measurers' significant relationship with the performance in terms of ROE and ROA of commercial banks. In addition, with the balanced panel data of 19 commercial banks in Nepal, Shrestha and Niraula (2021) found significant negative impact of non-performing loan ratio on return on assets. However, the consequence of capital adequacy ratio was found positive on ROA.

3. Research Methods

The main objective of this study is to investigate the impact of credit risk variables on the profitability of commercial banks in Nepal. Further, it evaluates the result by comparing the performance of private banks with that of joint venture banks. The descriptive design has been adopted to describe the characteristics of study variables. Further, the comparative design has been employed to draw the conclusion. These tools were helpful in investigating the direction, magnitude of the association and more the casual relationship of credit risk determinants and profitability of the banks. The secondary data has been used for bank credit risk in terms of liquidity, capital ratio, size, operational efficiency, loan growth rate, and non-performing loans and profitability represented by ROA. The data was based on panel data collected from databases (annual reports) provided on websites of the banks. This study considers two commercial bank groups: joint venture banks and private banks, which are significant players in the financial sector and take significant credit risk implications. 18 commercial banks (12 private and 6 joint venture) with operating histories make up the study's population. The sample is based on convenient method and includes data from ten sample banks (5 from each group) spanning five years. Mean and standard deviation are two descriptive statistics that are used to investigate the sample banks' level of credit risk and profitability. To ascertain whether there are differences between the two types of banks, the independent samples t-tests were run. In order to investigate relationships between the risk variable and the profitability measure, Pearson's correlation analysis was also carried out. A total of five years of data from sample banks were gathered from online sources, and SPSS software was used for the necessary processing, computations, and analysis.

Study Variables and Measures

Based on the empirical evidences reported in the earlier sections, this study has used the return on assets (ROA) as the proxy of profitability measure. Similarly, six variables namely; liquidity, capital ratio, bank size, operating inefficiency, gross loan and non-performing loan are taken as predictors of ROA. The predefined research objectives aim to describe comparative status of credit risk and profitability factors of

the sample banks. Similarly, to determine direction and magnitude of the association among the independent and dependent variable is another objective of the study. A brief description of study variables and their measurement is presented in Table 1.

Table 1

Study Variables and Definitions

Variables	Measures
Return on Assets (ROA)	Measured as net profit after tax to total assets.
Bank Liquidity (BL)	Measured as total loans divided by total deposits.
Capital Ratio (CR)	Measured as total equity to total assets.
Bank Size (BS)	Measured as natural logarithm of total assets.
Operating Inefficiency (OI)	Measured as total operating expenses divided by total assets.
Growth rate in Loan (LR)	Measured as the difference between current year loans and previous year loans divided by previous year loans.
Non-performing Loan (NPL)	Measured as the non-performing loans to total loans

4. Results

Descriptive analysis of credit risk and profitability

Table 2 reports comparative descriptive statistics of the study variables.

Table 2

Descriptive Statistics

Variables	Private Commercial Banks				Joint Ventures Commercial Banks			
	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max
ROA	1.35	0.41	0.71	2.15	1.57	0.46	0.70	2.61
BL	85.48	6.56	72.00	95.00	86.12	5.37	66.00	92.00
CR	0.12	0.02	0.08	0.14	0.11	0.01	0.10	0.15
BS	11.23	0.17	10.92	11.56	11.24	0.14	11.01	11.62
OI	1.50	0.37	0.56	2.24	5.76	5.85	0.02	17.96
GL	0.22	0.17	0.02	0.75	0.44	1.25	0.06	6.42
NPL	1.71	0.94	0.55	3.98	0.81	0.70	0.12	2.68

Note. $N = 10$ ($n = 5$ for each group).

In terms of profitability, joint venture banks ($M=1.57$, $SD=.463$) perform better than private banks private banks ($M=1.32$, $SD=.413$) with highest 2.61 ROA. Similar to

the result liquidity, joint venture banks pose more liquidity status ($M=86.12$, $SD=.5.372$) than private banks ($M=85.46$, $SD=6.65$). Private Banks have higher capital ratio ($M=.115$, $SD=.019$) with comparison to joint venture banks ($M=.114$, $SD=.011$). In addition, the asset size of private banks ($M=.11.239$, $SD=.166$) is little lower than of the joint venture banks ($M=.11.241$, $SD=145$). With regard to operating inefficiency, the joint venture banks ($M=5.757$, $SD=5.853$) face more inefficiencies with comparison to private banks ($M=1.496$, $SD=.374$).

The status of loan growth rate of joint venture banks ($M=.436$, $SD=1.251$) is very higher than private banks ($M=.222$, $SD=.172$). The non-performing loan of private banks ($M=1.712$, $SD=.936$) was quite higher than of the joint venture banks ($M=.808$, $SD=.703$). Therefore, in comparison to private bank, joint venture banks have better status of liquidity, capital ratio, total assets, and loan growth rate. In contrast, operating inefficiency of joint venture bank is higher than of private which exposes more credit risk. Private banks, in other hand, hold better capital ratio and less operating inefficiency than the joint ventures but higher rate of non-performing loan provide more credit risk.

Analysis of difference in study credit risk and profitability between private and joint venture banks

To ascertain whether credit risk indicators differ across the study's private and joint venture banks, the Independent Samples Test (two-sample t test) was performed. The outcome demonstrated that the individual Levene's test significance statistics ($p>0.05$) for the four factors that determine credit risk (viz. bank liquidity, bank size, NPL, and GL) are not statistically significant; consequently, joint venture banks do not have significantly different scores for these factors than do private banks. Similar to this, Levene's test revealed that two independent variables—capital ratio and operating efficiency—are significantly different in private and joint venture banks ($p0.05$). Similar test statistics indicated that the ROA of these bank types did not differ much. Table 3 summarizes the specific test settings.

As per the result reported in Table 3, there was a no significant difference in the profitability (ROA) of private banks ($M=1.32$, $SD=.413$) and joint venture banks ($M=1.569$, $SD=.463$) due to test outcomes ($t=-1.54$, $p=.086$). Similar to liquidity, there was no statistically significant difference between private banks ($M=85.46$, $SD=6.65$) and joint venture banks ($M=86.12$, $SD=.5.372$) for credit risk characteristics ($t=-.377$, $p=.708$). Similarly, there was no significant difference ($t=.193$, $p=.848$) observed in the capital ratios of private banks ($M=.115$, $SD=.019$) and joint venture banks ($M=.114$, $SD=.011$). In addition, size of the banks also found not significantly different ($t=-.034$, $p=.937$), between the private banks ($M=.11.239$, $SD=.166$) and joint venture banks ($M=.11.241$, $SD=145$). Since values of $t=-3.631$,

$p=.001$, there was a significant difference in operating efficiency between joint venture banks ($M=5.757$, $SD=5.853$) and private banks ($M=1.496$, $SD=.374$).

Table 3

Two Sample t-test Result

	Private Banks		Joint Venture Banks		Levene's Test for Equality of Variances			
	Mean	S.D.	Mean	S.D.	F	Sig.	t-stat.	Sig.
ROA	1.352	.413	1.569	.463	.586	.448	-1.54	.086
BL	85.48	6.565	86.12	5.372	2.304	.136	-.377	.708
CR	.115	.019	.114	.011	10.667	.002	.193	.848
BS	11.239	.166	11.241	.145	.460	.501	-.034	.937
OI	1.496	.374	5.757	5.853	25.604	.000	-3.631	.001
GL	.222	.170	.436	1.251	2.490	.121	-.848	.400
NPL	1.712	.936	.808	.703	1.372	.247	3.856	.000

In addition, there was no statistically significant difference between the GL for private banks ($M=.222$, $SD=.172$, $t=-.848$, $p=.400$) and joint venture banks ($M=.436$, $SD=1.251$). The result also revealed that there was a significant difference in NPL between private banks ($M=1.712$, $SD=.936$) and joint venture banks ($M=.808$, $SD=.703$) with test statistics ($t=3.856$, $p=.000$). Thus, the results have indicated that the status of credit risk factors; operating efficiency and non-performing loan are considerably different in private and joint venture banks. However, other parameters such as liquidity, capital ratio, size, and loan growth rate did not find any significant differences between the two bank types.

Correlation analysis of the study variables

Regarding credit risk indicators and the profitability of the sample banks, Table 4 exhibits Spearman's correlation coefficients and their corresponding significant values. For both bank types separately and additionally for the full sample, the associations between study variables are presented and examined.

As shown in Table 4, the BL and BS of both private and joint venture banks had a negative correlation with ROA. There was no statistically significant correlation between BL, BS, and ROA. This shown that there is no relationship between bank liquidity, bank size, and bank return on assets. Any rise in capital ratio results in an improvement in return on assets for both private and joint venture banks in Nepal, according to a significant positive association between CR and ROA. The link

between a private commercial bank's OI and ROA is clearly negative, indicating that a rise in OI (total operating expenses) will reduce a bank's return on assets.

Table 4
Correlation for Study Variables

Variables	Private Commercial Banks		Joint Ventures Banks		Overall Banks	
	Coefficient	Sig.	Coefficient	Sig.	Coefficient	Sig.
BL	-0.052	0.804	-0.046	0.826	-0.034	0.815
CR	.655**	.000	.483*	.015	.535**	.000
BS	-.207	0.322	-.337	.100	-.259	.069
OI	-.429*	.032	.239	.249	.251	.078
GL	-.331	0.106	.188	0.368	.135	0.350
NPL	-.377	0.063	-.141	0.502	-.343*	0.015

* $p < .05$. ** $< .01$.

Similar to this, OI and ROA of joint venture banks have a positive but minimal association. For private and joint venture banks, the OI results are inconsistent. While there is a positive correlation between GL and ROA of joint venture banks, there is a negative correlation between GL and ROA of private commercial banks. The GL correlations for both banks are inconsistent and statistically negligible.

As a result, when all the banks included in the study were considered, the association between credit risk factors and ROA resulted in a range of outcomes. The findings revealed no relationship between bank liquidity and ROA, with $r(49) = -.03, p > .05$. Capital ratio and ROA exhibited a significant moderately favorable connection ($r(49) = .56, p .001$). There is a modest negative correlation between bank size and ROA, $r(49) = .56, p < .001$. Operating inefficiency had a weak but insignificant correlation ($r(49) = .25, p .078$) with ROA. Additionally, it was discovered that loan growth and ROA had a weakly positive correlation ($r(49) = .13, p .350$). Non-performing loans and ROA had a significant moderate, negative relationship ($r(49) = -.343, p .015$).

4. Discussion

The finding of the study has shown a negative and insignificant association with ROA which is in contrast to the empirical findings of Cheng et al. (2020), who reported positive and significant associations between the variables. The liquidity crisis of banks has been a common issue since the last decade; therefore, banks shall

improve their liquidity status with various measures as per guidance provided by the central banks.

On the other hand, the capital ratio of both bank types produced a positive and significant association with ROA, consistent with the many previous findings (Cheng et al., 2020; Islam & Rana, 2022; Kurawa & Garba, 2014; Lew & Lau, 2022; Shrestha & Niraula, 2021; Suganya & Kengatharan, 2018). However, this finding contradicts the studies of Ndoka and Islami (2016) and Bagale (2023), who revealed insignificant relations between these variables. The finding has indicated that the increment in equity portion in the capital structure helps maintain the profitability situation of banks.

Similarly, the result showed that bank size was associated with ROA in a negative and insignificant manner. It is due to the large size of the sample banks, which contributes to liquidity creation and is thus a reason for lower profitability. The finding is consistent with the result of Suganya and Kengatharan (2018) but inconsistent with the results of Bhattari (2016) and Bagale (2023).

The results have shown higher operating inefficiencies of joint venture banks than private banks. It may be due to their higher operating expenses. The result showed a negative and insignificant association between operating inefficiency and profitability. This result supports the finding of Suganya and Kengatharan (2018) but opposes the result of Kurawa and Garba (2014). The result has indicated the need to reduce the operating inefficiencies of the banks as they reduce profitability and increase their credit risk. The growth rate in loans correlates positively with profitability in the case of joint venture banks but negatively in the case of private banks. However, there is a positive association between loan growth and ROA for all banks. The private banks could review their loan status and processes to improve the situation.

A non-performing Loan was found to be insignificantly negatively associated with profitability. This result is consistent with the findings of Suganya and Kengatharan (2018) but not in line with the findings of Oke and Tihamiyu (2022), Cheng et al. (2020), Islam and Rana (2022), and Lew and Lau (2022). Higher non-performing loans create more credit risk and affect profitability too. The private sector banks should effectively manage non-performing loans by creating more provisions.

Conclusion

The bank's credit risk is rated moderate as almost all credit risk determinants are within acceptable limits. The joint venture banks lead private banks in terms of liquidity, capital ratio, total assets, non-performing loans, and loan growth rate status, but they pose more operating inefficiencies than private banks. However, private

banks enjoy a higher capital ratio and lower operating inefficiency. Thus, exposure to credit risk is relatively lower in joint venture banks. The result of the independent t-test indicates a significant difference in non-performing loans and operating inefficiency between the bank groups. The profitability and other credit risk variables; liquidity, capital ratio, size, and loan growth rate, are not significant differences between the two bank types.

The correlation results of private banks showed a positive and significant association with capital ratio, and the remaining credit risk variables are negatively correlate with profitability. In the case of joint venture banks, capital ratio, operating inefficiency, and growth in loan rates have positive associations with profitability, but liquidity, size, and non-performing loans have negative associations with profitability. By considering all sample banks, the association of bank liquidity and capital ratio with ROA is significant and moderate. A modest negative correlation among bank size, operating inefficiency, and nonperforming loans is found with ROA. Additionally, loan growth and ROA have a weak but positive correlation with ROA.

The findings of the study provide important insight to bank managers in managing credit risk issues for better liquidity and operational efficiencies. The implications of the findings are also important for maintaining concentration, processing non-performing loans, and operating inefficiency issues. Policymakers can review existing policies to mitigate negative consequences and bring stability to financial institutions. The study included samples and data from a limited number of banks, allowing future studies to explore credit risk and profitability issues more extensively.

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