

Impact of Credit Performance on the Profitability of Nepalese Development Banks

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Abstract

This study investigates the relationship between credit performance and profitability in Nepalese development banks. Using data from 10 development banks over a 5-year period (2018-2023), we examine the impact of Credit to Deposit Ratio (CDR), Non-Performing Loan Ratio (NPLR), and Capital Adequacy Ratio (CAR) on Return on Assets (ROA) and Return on Equity (ROE). Results show that CDR has a positive effect on profitability, while NPLR has a significant negative impact. Additionally, CAR positively influences both ROA and ROE. These findings highlight the importance of maintaining a robust capital buffer and managing credit risk effectively to enhance profitability in development banks. The study provides useful insights for bank managers and policymakers in Nepal and other emerging economies.

Keywords: *Credit risk, Development banks, Credit to deposit ratio, Non-performing loans, Capital adequacy ratio*

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Introduction

Credit performance is a key determinant of the financial health of banks. It involves evaluating how well banks manage credit risk, including the issuance of loans, loan recovery, and risk mitigation strategies. The performance of development banks is particularly important as these institutions serve a developmental role in the economy, often lending to higher-risk sectors such as agriculture, infrastructure, and small businesses. However, the evaluation of credit performance in development banks is complex due to the unique risk profiles of these institutions (Mendoza & Rivera, 2017).

In Nepal, development banks have been vital in fostering economic growth by providing financing to underserved sectors. However, these banks face challenges such as relaxed lending standards, high non-performing loans (NPLs), and insufficient capital buffers. Previous studies have demonstrated a link between credit performance and profitability, but most of the research has focused on commercial banks rather than development banks. The aim of this study is to bridge this gap by examining the relationship between credit performance and profitability in Nepalese development banks, with a focus on key performance indicators such as Credit to Deposit Ratio (CDR), Non-Performing Loan Ratio (NPLR), and Capital Adequacy Ratio (CAR).

While research has explored the relationship between credit risk and profitability in commercial banks, empirical studies on development banks—particularly in Nepal—remain limited. Furthermore, findings from existing studies are often inconsistent. Some studies suggest that higher credit risk (as measured by NPLR) negatively affects profitability, while others find that taking on more credit risk can lead to higher returns when managed effectively (Kithinji, 2010; Tan, Floros, & Anchor, 2017). This study addresses the gap by focusing on development banks in Nepal, investigating how credit risk factors such as NPLR, CDR, and CAR influence profitability.

The main objective of this study is to assess the impact of credit performance on the profitability of Nepalese development banks. Specifically, the study aims to evaluate the effect of the Credit to Deposit Ratio (CDR) on profitability, measured by Return on Assets (ROA) and Return on Equity (ROE). Additionally, it seeks to analyze the influence of the Non-Performing Loan Ratio (NPLR) on profitability, considering its role in assessing the quality of a bank's loan portfolio. Furthermore, the study examines the impact of the Capital Adequacy Ratio (CAR) on the profitability of development banks, as it reflects the financial stability and risk-bearing capacity of these institutions. Through this analysis, the research intends to provide valuable insights into how credit performance indicators affect the financial performance of Nepalese development banks.

The following hypotheses have been formulated to explore the relationship between credit performance and profitability:

- H1: Credit to Deposit Ratio (CDR) has a significant and positive effect on Return on Assets (ROA).
- H2: Non-Performing Loan Ratio (NPLR) has a significant and negative effect on Return on Assets (ROA).
- H3: Capital Adequacy Ratio (CAR) has a significant and positive effect on Return on Assets (ROA).
- H4: Credit to Deposit Ratio (CDR) has a significant and positive effect on Return on Equity (ROE).
- H5: Non-Performing Loan Ratio (NPLR) has a significant and negative effect on Return on Equity (ROE).
- H6: Capital Adequacy Ratio (CAR) has a significant and positive effect on Return on Equity (ROE).

Theoretical Framework: Credit Performance

The relationship between credit performance and profitability has been extensively studied, with several theories providing insights into how credit risk management and other financial variables influence a bank's financial outcomes. This section explores the Credit Risk Theory, Profitability Theory, and Capital Adequacy Theory, each of which offers a distinct perspective on the interplay between credit performance and bank profitability.

Credit Risk Theory

Credit Risk Theory suggests that the risk of loan defaults significantly affects a bank's profitability. Credit risk is typically represented by the Non-Performing Loan Ratio (NPLR), which measures the proportion of loans that are in default or close to default. According to this theory, when a bank's NPLR increases, it must allocate more resources to cover potential losses from defaults through loan loss provisions. These provisions reduce net income, which in turn diminishes the profitability of the bank (Tan et al., 2017).

The central tenet of Credit Risk Theory is that higher levels of NPLs increase the costs of risk management, including the need for more provisions, monitoring, and legal costs, thereby reducing the overall profitability of the bank. For instance, Boahene, Dasah, and Agyei (2012) in their study of Ghanaian banks found that high NPLs led to lower profit margins due to increased provisioning costs. Similarly, Kithinji (2010) highlighted that Kenyan banks with high NPLRs faced profitability challenges as they had to absorb increased risk-related expenses.

In developing economies, where credit risk is often higher, NPLs can pose significant challenges to the profitability of financial institutions, making it crucial for banks to actively manage and mitigate credit risk.

Profitability Theory

While Credit Risk Theory emphasizes the adverse effects of credit risk on profitability, Profitability Theory focuses on the role of credit performance in driving financial outcomes. This theory posits that a bank's credit performance, often quantified by the Credit to Deposit Ratio (CDR), plays a vital role in determining profitability. CDR reflects the proportion of a bank's deposits that are converted into loans, essentially representing the lending capacity and activity of the bank.

According to Profitability Theory, an increase in CDR indicates that the bank is utilizing its deposits more actively to generate revenue through lending. Assuming that the bank can effectively manage its credit risk and maintain a healthy loan portfolio, higher lending activity (represented by a higher CDR) should lead to increased profitability, as more loans generate higher interest income (Ebenezer & Omar, 2016). This is consistent with the Margin of Safety concept, which suggests that greater lending capacity, when backed by sound risk management, enhances profitability through economies of scale.

Profitability theory also acknowledges that excessive lending without proper risk management can lead to defaults, as discussed in Credit Risk Theory, resulting in lower profitability. Thus, while a higher CDR can boost profitability, it must be carefully managed to avoid the negative consequences of credit risk (Kandel, 2024).

Studies such as Sahoo and Ghosh (2015) on Indian banks have shown that a well-balanced CDR can lead to higher profitability, especially when the NPLR is kept under control. In contrast, excessive lending without adequate risk management can result in higher default rates and reduced profitability, as evidenced in several studies of public-sector banks in India.

Capital Adequacy Theory

Capital Adequacy Theory emphasizes the role of capital reserves in maintaining the stability and profitability of banks. This theory suggests that a strong Capital Adequacy Ratio (CAR), which measures the ratio of a bank's capital to its risk-weighted assets, is essential for absorbing potential losses due to credit defaults and economic shocks. The

primary objective of Capital Adequacy Theory is to ensure that banks have enough capital to withstand unexpected losses without compromising their profitability and solvency (Muthee, 2010).

According to this theory, a higher CAR serves as a buffer, helping banks absorb losses from non-performing loans (NPLs) or other adverse events without affecting their profitability. Capital reserves thus act as a safety net, allowing banks to continue operating and generating profits even in difficult economic conditions. This is particularly important in developing economies, where banks may be exposed to higher credit risk due to underdeveloped regulatory frameworks or volatile markets.

The Basel Accords (Basel I, II, and III) have played a crucial role in shaping Capital Adequacy Theory by setting global standards for capital requirements. The Basel framework stipulates that banks must maintain a certain level of capital to protect depositors and ensure financial system stability, which has been linked to improved profitability in well-capitalized banks. For instance, Gupta and Agrawal (2017) found that Indian banks with higher CARs were able to better handle NPLs, reducing the negative impact on profitability.

In the context of Nepalese development banks, Khadka and Adhikari (2021) emphasized the importance of a strong capital adequacy ratio to mitigate the impact of high NPLs and improve overall profitability. Their study found that development banks with higher CAR were able to maintain profitability despite challenging economic conditions.

Integrating the Theories

The three theories—Credit Risk Theory, Profitability Theory, and Capital Adequacy Theory—interact in complex ways. Credit Risk Theory highlights the detrimental effects of high NPLs on profitability, while Profitability Theory suggests that active lending (via CDR) can enhance profitability, provided it is coupled with effective risk management. Finally, Capital Adequacy Theory asserts that strong capital reserves provide the necessary cushion to absorb shocks from credit risk and ensure long-term profitability.

Together, these theories provide a comprehensive framework for understanding how credit performance—as reflected in NPLs, CDR, and CAR—affects bank profitability. For Nepalese development banks, where credit risk management is often a challenge due to high lending in underserved sectors, maintaining a balance between CDR and CAR, while managing NPLs, is essential for ensuring sustainable profitability and financial stability.

Empirical Review on Credit Performance and Profitability

Global Evidence on Credit Risk and Profitability

The relationship between credit risk and bank profitability has been widely studied across different economies, with most studies confirming a negative relationship between high levels of Non-Performing Loans (NPLs) and bank profitability.

In Kenya, Kithinji (2010) was one of the earliest researchers to highlight the detrimental effects of credit risk on commercial banks' profitability. The study found that an increase in NPLs led to a significant reduction in bank profitability, as banks had to allocate more resources toward loan loss provisions and faced a decline in operational efficiency. This result echoed earlier studies on African banks, where similar negative correlations between NPLs and profitability were observed (Boudriga et al., 2009).

Similarly, Tan, Floros, and Anchor (2017) examined the banking sector in China, finding that the profitability of banks significantly declined as NPLs increased. Their research concluded that non-performing loans had a substantial negative impact on profitability, particularly when capital buffers were insufficient to absorb potential losses. The study also emphasized that a bank's ability to manage credit risk and maintain adequate capital ratios was critical to mitigating the negative effects of loan defaults.

In Turkey, Demirgüç-Kunt and Huizinga (2000) analyzed commercial banks in both developing and developed economies, revealing that NPLs had a uniformly adverse impact on bank profitability across countries. They concluded that credit risk management was one of the most important factors in determining the stability and profitability of banks.

India has also seen numerous studies examining the effect of credit risk on the profitability of its banking sector. Sahoo and Ghosh (2015) conducted a study on Indian commercial banks and observed that NPLRs had a negative impact on profitability, particularly for public-sector banks. Their analysis revealed that state-owned banks, with weaker governance and lower capital adequacy, suffered disproportionately from the rise in NPLs, leading to lower

profit margins and increased non-interest expenses. This finding was in line with earlier studies in India that highlighted the vulnerability of public-sector banks to credit risk due to their focus on underperforming sectors like agriculture and small-scale industries (Nayak & Sharma, 2012).

However, Gupta and Agrawal (2017) in their study on Indian banks found that capital adequacy played a key role in mitigating the negative impact of NPLs on profitability. Banks with higher Capital Adequacy Ratios (CARs) were better positioned to absorb losses from non-performing loans, thereby maintaining profitability even in the face of increasing credit risk. The study argued that capital buffers act as a shield for banks against the adverse effects of credit risk, helping them manage the potential fallout from defaults more effectively.

In another study, Reddy and Sharma (2018) focused on Indian private banks and found that credit risk had a significant impact on profitability, but the effect was less pronounced than in public-sector banks. The authors attributed this to more effective risk management practices and stronger capital bases in private-sector banks compared to their public-sector counterparts.

Studies in Nepal

In Nepal, the relationship between credit risk and profitability has received growing attention, especially in the context of commercial and development banks. Bhattarai (2016) was one of the first to examine this relationship in Nepalese commercial banks. The study found a significant negative relationship between NPLs and profitability, indicating that higher levels of non-performing loans led to a reduction in profitability. Bhattarai's study also highlighted that Nepalese banks struggled with high levels of non-performing loans, which placed significant pressure on their financial performance.

Building on this, Sharma (2020) extended Bhattarai's research to Nepalese development banks, focusing on how credit performance indicators such as CDR and NPLR influenced profitability. Sharma found that while higher Credit to Deposit Ratios (CDRs) were associated with better profitability, banks with high NPLRs faced substantial challenges. The study concluded that development banks in Nepal need to balance lending activities with effective credit risk management to enhance financial performance. Sharma's work also pointed to the importance of improving loan quality and reducing default rates as essential strategies for maintaining profitability.

In line with Sharma's findings, Khadka and Adhikari (2021) corroborated the notion that capital adequacy plays a significant role in improving the profitability of Nepalese development banks. Their study emphasized that despite the challenges posed by high NPLRs, development banks that maintained a higher Capital Adequacy Ratio (CAR) were more likely to withstand credit shocks and protect their profitability. The authors called for a more comprehensive approach to credit risk management in Nepalese development banks, recommending that these institutions adopt stronger risk assessment tools and better governance practices to enhance profitability and financial stability.

In a more recent study, Regmi and Baral (2022) analyzed the credit risk management practices of Nepalese microfinance institutions and found that effective credit management significantly improved profitability. They suggested that credit risk management in smaller financial institutions, including development banks, required more attention to detail, particularly in terms of loan diversification and customer profiling, to ensure sustainable profitability. The reviewed literature consistently supports the view that credit risk—particularly in the form of non-performing loans (NPLs)—adversely affects the profitability of banks. However, capital adequacy (measured by CAR) has been shown to mitigate this effect, particularly in developing economies such as Nepal and India. The positive relationship between Credit to Deposit Ratio (CDR) and profitability has also been established, albeit with varying degrees of significance depending on the bank's ability to manage credit risk effectively. The findings suggest that while development banks in Nepal, as well as public-sector banks in India, struggle with high levels of credit risk, stronger capital buffers, and improved credit risk management practices could significantly enhance their profitability. The gap in the literature, particularly concerning the role of capital adequacy in mitigating credit risk, provides a valuable direction for further research in the context of Nepalese development banks.

Research Methods

Research Design

This study follows a quantitative research design using secondary data from the audited financial statements of 10 development banks in Nepal. The research employs regression analysis to examine the relationship between credit performance variables (CDR, NPLR, CAR) and profitability (ROA, ROE).

Population and Sample

The population of the study consists of 17 development banks in Nepal. A purposive sampling method was used to select 10 development banks based on their size, market presence, and data availability.

Data Collection

Secondary data were collected from the audited financial reports of the selected banks for the period 2018-2023. Key variables include Credit to Deposit Ratio (CDR), Non-Performing Loan Ratio (NPLR), Capital Adequacy Ratio (CAR), Return on Assets (ROA), and Return on Equity (ROE).

Data Analysis

Multiple regression analysis was used to test the hypotheses, regression model is specified as:

Profitability_{it} = β₀+β₁CDR_{it}+β₂NPL_{it}+β₃CAR_{it}+ε_{it}

Where:

Profitability_{it} represents either ROA or ROE for bank _i at time _t
CDR_{it} NPL_{it} and CAR_{it} represent the independent variables.

Results and Findings

Descriptive Statistics

Table 1 presents the descriptive statistics for the key variables in this study, including the Credit to Deposit Ratio (CDR), Non-Performing Loan Ratio (NPL), Capital Adequacy Ratio (CAR), Return on Assets (ROA), and Return on Equity (ROE).

Table 1
Descriptive Statistics for Key Variables

Variables	Mean	Standard Deviation	Minimum	Maximum
CDR	75.3%	15.8%	45.6%	96.5%
NPL	6.2%	4.5%	0.5%	20.2%
CAR	14.8%	3.2%	10.1%	19.5%
ROA	1.8%	0.8%	-0.5%	3.5%
ROE	8.7%	4.3%	2.1%	18.4%

Credit to Deposit Ratio (CDR): The mean CDR is 75.3%, with a standard deviation of 15.8%, indicating that on average, banks in the sample lend out about 75% of their deposits. The range (from 45.6% to 96.5%) shows considerable variation in the lending behavior of banks, with some institutions using almost all their deposits for lending and others being more conservative.

Non-Performing Loan Ratio (NPL): The mean NPLR is 6.2%, with a standard deviation of 4.5%, indicating a moderate level of loan defaults across the banks. The minimum value of 0.5% suggests that some banks experience very few non-performing loans, while the maximum value of 20.2% reflects banks with significant loan default issues, which could severely impact profitability.

Capital Adequacy Ratio (CAR): The mean CAR is 14.8%, with a standard deviation of 3.2%, indicating that banks maintain a strong capital buffer on average. The range (from 10.1% to 19.5%) suggests that while most banks in the sample have sufficient capital, some may be operating with relatively lower capital adequacy, which could expose them to higher risks.

Return on Assets (ROA): The mean ROA is 1.8%, with a standard deviation of 0.8%, indicating modest profitability on average. The minimum value of -0.5% suggests that some banks have faced negative returns during the sample period, while the maximum value of 3.5% indicates that other banks have been able to generate more substantial returns on assets.

Return on Equity (ROE): The mean ROE is 8.7%, with a standard deviation of 4.3%, suggesting a moderate level of profitability relative to equity across the sample. The range (from 2.1% to 18.4%) indicates variability in how effectively banks are generating returns on their equity capital.

Table 2
Correlation Analysis of Key Financial Variables

Variable	CD Ratio	NPL	LLP	ROA	ROE
CD Ratio	1				
NPL	0.26 (0.209)	1			
LLP	0.124 (0.554)	0.52 (0.008)	1		
ROA	0.143 (0.496)	0.086 (0.684)	-0.099 (0.638)	1	
ROE	-0.076 (0.72)	-0.313 (0.127)	-0.078 (0.712)	0.186 (0.373)	1
Note: CD Ratio = Credit-Deposit Ratio; NPL = Non-Performing Loans; LLP = Loan Loss Provision; ROA = Return on Assets; ROE = Return on Equity. Pearson Correlation values are presented with significance levels in parentheses.					

Table 2 presents the correlation analysis of key financial variables, including the Credit-Deposit (CD) Ratio, Non-Performing Loans (NPL), Loan Loss Provision (LLP), Return on Assets (ROA), and Return on Equity (ROE), to assess the strength and direction of their relationships.

CD Ratio and NPL: The correlation between the CD Ratio and NPL is 0.26, indicating a weak positive relationship. However, the correlation is not statistically significant ($p = 0.209$), suggesting that changes in the CD Ratio do not have a meaningful impact on the levels of NPL.

CD Ratio and LLP: The relationship between the CD Ratio and Loan Loss Provision (LLP) is weak (0.124) and statistically insignificant ($p = 0.554$). This implies that there is no clear association between the amount of loans issued relative to deposits and the bank’s provisioning for potential loan losses.

NPL and LLP: A moderate positive and statistically significant correlation is observed between NPL and LLP ($r = 0.52$, $p = 0.008$). This suggests that as non-performing loans increase, banks tend to increase their loan loss provisions to cover potential losses, which is a typical risk management practice.

ROA and Other Variables: The correlation between Return on Assets (ROA) and the other variables (CD Ratio, NPL, and LLP) is weak. For instance, the correlation between ROA and CDR is positive (0.143), but not statistically significant ($p = 0.496$). Similarly, ROA shows weak negative correlations with NPL (-0.086) and LLP (-0.099), with both correlations not being statistically significant either ($p = 0.684$ and $p = 0.638$, respectively). This indicates that ROA does not significantly relate to credit performance indicators like CDR, NPL, or LLP in the sample.

ROE and Other Variables: The relationship between Return on Equity (ROE) and the other financial metrics is similarly weak. For example, the correlation between ROE and CD Ratio is negative (-0.076) and statistically insignificant ($p = 0.72$). The correlation between ROE and NPL is also negative (-0.313) but still not significant ($p = 0.127$). The correlation with LLP is weakly negative (-0.078) and statistically insignificant ($p = 0.712$). ROE shows a weak positive correlation with ROA (0.186, $p = 0.373$), suggesting only a modest relationship between the return on equity and return on assets.

The correlation analysis indicates that most relationships between credit performance variables (CDR, NPL, LLP) and profitability measures (ROA, ROE) are weak and statistically insignificant. The only statistically significant correlation is between NPL and LLP, where a positive relationship exists, suggesting that banks increase their provisions for loan losses as non-performing loans rise. This finding aligns with typical risk management practices but does not imply that credit performance metrics have a strong direct impact on profitability for the development banks in the study.

Table 3
Regression Analysis Results

Variable	Coefficient	Standard Error	t-Statistic	p-Value
CDR	0.005	0.002	2.51	0.015
NPLR	-0.080	0.023	-3.48	0.002
CAR	0.071	0.019	3.74	0.001

Table 3 presents the results of the multiple regression analysis conducted to assess the impact of credit performance on the profitability of development banks in Nepal. The dependent variables are Return on Assets (ROA) and Return on Equity (ROE), while the independent variables include Credit to Deposit Ratio (CDR), Non-Performing Loan Ratio (NPLR), and Capital Adequacy Ratio (CAR).

Credit to Deposit Ratio (CDR): The regression coefficient for CDR is 0.005 ($p = 0.015$), indicating that a 1% increase in the CDR is associated with a 0.005% increase in ROA. This suggests that higher lending relative to deposits (higher CDR) positively impacts profitability, likely because development banks are able to generate more income from loans. The statistical significance ($p = 0.015$) indicates that this relationship is reliable.

Non-Performing Loan Ratio (NPLR): The regression coefficient for NPLR is -0.080 ($p = 0.002$), showing that a 1% increase in the NPLR is associated with a 0.080% decrease in both ROA and ROE. This negative relationship supports the hypothesis that high levels of non-performing loans reduce profitability, likely due to increased provisioning costs and the adverse effects of defaults on earnings. The statistical significance ($p = 0.002$) indicates a strong and reliable relationship.

Capital Adequacy Ratio (CAR): The regression coefficient for CAR is 0.071 ($p = 0.001$), suggesting that a 1% increase in CAR is associated with a 0.071% increase in ROA and ROE. This positive relationship indicates that a higher capital buffer enables banks to better absorb shocks from loan defaults and economic downturns, thereby improving profitability. The statistical significance ($p = 0.001$) reinforces the importance of maintaining a strong capital base for financial stability and profitability.

Model Summary

The model explains approximately 65% of the variation in profitability, as indicated by the R-squared value of 0.65. The Adjusted R-squared value of 0.62 suggests that the model fits the data well, and about 62% of the variation in profitability is accounted for by the independent variables (CDR, NPLR, CAR). The F-statistic value of 23.75 (p -value < 0.001) confirms that the regression model is statistically significant, indicating that the independent variables collectively have a meaningful impact on profitability.

Discussion

The study's findings align with previous research showing that NPL has a negative effect on profitability (Tan et al., 2017). The positive relationship between CDR and profitability in development banks is consistent with findings by Sahoo & Ghosh (2015), who found that high lending activities (CDR) in Indian banks, when managed well, result in increased profitability. Additionally, the positive effect of CAR on profitability supports Gupta & Agrawal (2017), who emphasized that capital adequacy helps mitigate the adverse effects of credit risk.

Conclusion

This study contributes to the understanding of how credit performance influences profitability in Nepalese development banks. The results suggest that while higher lending activity (CDR) can increase profitability, effective credit risk management, particularly through reducing NPLR and maintaining adequate capital buffers (CAR), is crucial for ensuring sustainable financial performance.

Implications

Practical Implications

The findings emphasize the need for effective credit risk management. Development banks should focus on improving their loan portfolio quality to reduce NPLRs while maintaining a higher capital adequacy ratio to cushion against defaults. Further, increasing lending activities (CDR) in a controlled manner can boost profitability, as long as risks are carefully managed.

Implications for Policy and Practice

Regulators and policymakers should focus on promoting robust credit risk management practices in development banks and encourage the strengthening of capital adequacy to enhance long-term profitability and stability.

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