Determinants of net interest margin in Nepalese commercial banks

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Abstract

This study aims to explore and analyze the determinants of Net Interest Margin (NIM) of Nepalese commercial banks. It focuses on three independent variables: Capital Adequacy Ratio (CAR), Credit-Deposit Ratio (CDR), and Non-Performing Loan Ratio (NPLR). Descriptive analysis and regression tests were conducted to analyze the data obtained from a sample of 10 commercial banks with 50 observations. The descriptive statistics reveal the mean and range of the variables, indicating the average and variability of CAR, CDR, NPLR, and NIM in the sample. The regression analysis examines the relationship between the independent variables and NIM. The findings suggest that CDR significantly impacts NIM, indicating that higher utilization of deposits for lending activities contributes to increased interest income and, ultimately, higher NIM. However, CAR and NPLR do not show significant relationships with NIM. The results of this study are consistent with previous research that emphasizes the importance of managing the credit-deposit relationship in optimizing NIM. The findings provide insights for Nepalese policymakers, banking regulators, and commercial banks to enhance profitability and financial stability.

Keywords: Capital Strength, Financial Performance, Indicators, Regression Analysis

Introduction

The net interest margin (NIM) is a crucial financial indicator that reflects the profitability and efficiency of commercial banks (Hijazeen, 2017). It measures the difference between interest income earned from loans and investments and the interest expenses paid on deposits and borrowings (Angbazo, 1997). In the context of Nepalese commercial banks, understanding the determinants of NIM is of significant importance as it provides insights into the factors influencing their profitability and helps formulate appropriate strategies for sustainable growth.

Nepal's banking sector facilitates economic development (Timsina, 2014) and provides financial services to individuals, businesses, and industries (Song et al., 2018). Over the years, the sector has experienced substantial growth and transformation, driven by increasing competition, regulatory reforms, and technological advancements (Dahal, 2018; Dahal et al., 2020). As the country aims to achieve higher levels of economic growth and financial stability, analyzing the determinants of NIM becomes imperative for policymakers, banking regulators, and commercial banks themselves.

The capital adequacy ratio (CAR) measures a bank's financial strength and ability to absorb losses (Mendoza & Rivera, 2017). It represents the proportion of a bank's capital to its risk-weighted assets, reflecting its ability to withstand adverse economic conditions and maintain stability. The credit-deposit ratio (CDR) measures a bank's loan portfolio concerning its deposit base (Biswal & Gopalakrishna, 2014). It indicates how much a bank relies on customer deposits to fund its lending activities. Non-performing loans (NPL) are loans that are in default or are at significant risk of default (Asfaw et al., 2016); as saying by Bholat et al. (2018), NPL is an indicator of credit

quality and asset quality of a bank's loan portfolio. NPLs can erode a bank's profitability by increasing provisions for loan losses and reducing interest income.

In the context of NIM, the CDR can be a crucial determinant as it reflects the bank's ability to efficiently deploy its funds and manage the balance between interest income and expenses. NIM, the CAR, can be a significant determinant as it influences a bank's capacity to generate profits and manage risks. Examining the relationship between NIM and CAR can provide insights into the impact of capital adequacy on the profitability of Nepalese commercial banks. NIM and NPL can provide insights into the effects of bank risk factors on the profitability of Nepalese commercial banks and the importance of effective loan management practices.

The Nepalese banking sector has experienced notable growth in recent years (Shrestha, 2018). The commercial bank sector has expanded its services to rural areas. However, challenges such as increasing non-performing loans, credit risk, and intense competition persist. Against this backdrop, what is the impact of CAR, CDR, and NPLR on the NIM of commercial banks in Nepal? Understanding the determinants of NIM is crucial for Nepalese commercial banks' sustainable growth and profitability. Understanding the determinants of NIM in Nepalese commercial banks is crucial for policymakers, banking regulators, and commercial banks. By examining the relationships between NIM and variables such as CAR, CDR, and NPL, this research aims to contribute to the existing body of knowledge on bank profitability and provide valuable insights for strategic decision-making in the banking sector. Hence, this study aims to explore the determinants for NIM and examine the effect of CAR, CDR, and NPL on the NIM of commercial banks in Nepal.

This kind of study is essential for several reasons. Firstly, the banking sector in Nepal plays a vital role in facilitating economic development and providing financial services to individuals, businesses, and industries. Analyzing the factors that influence NIM can give policymakers, banking regulators, and commercial banks valuable insights in formulating strategies to enhance the banking sector's profitability, efficiency, and overall financial stability.

Literature review

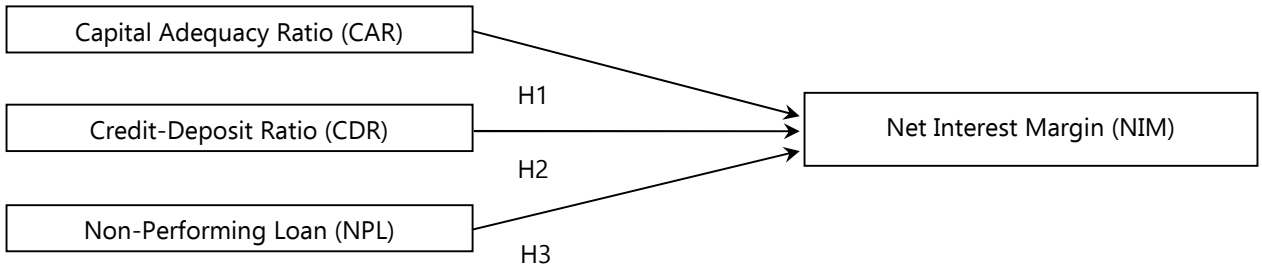
Based on the findings of Manurung et al. (2020), the financial ratio of a bank, which is the ratio of operating expenditures to operational revenue, as well as market power risk and asset significance, influences the net interest margin. Risal and Poudel (2020) found a significantly higher ROE and a moderately higher NIM. According to the findings of Abugamea (2018), F-statistics values indicate that overall internal and external variables have a considerable influence; however, internal and external factors do not significantly affect NIM. The banking sector has not reaped many benefits from the present inflationary climate or the economic advancements that have taken place. These results will be beneficial to academics as well as policymakers. Ramchandani and Jethwani (2017) found a substantial link between CDR and NIM. According to Murari and Pradhan (2019), the NIM is a ratio that assesses how effective a company is at investing its money compared to the expenditures on the same investments. A negative NIM indicates that the interest charges are more than the return, the investment creates. However, the other two models incorporating ROE and NIM as dependent variables are similarly statistically significant (Bhatia et al., 2012; Samad, 2015). These models were used to draw their conclusions.

Tariq et al. (2014) explained the banks' profitability using Return on Equity and Net Interest Margin. Pham and Nguyen (2017) said NIM and liquidity are good for CAR. Silaban (2017) argues that the CAR has little effect on a bank's ability to make money. Raharjo et al. (2014) said that all internal factors (capital balance, liquidity, etc.) have a different amount of importance on the net interest profit of Indonesian commercial banks. The Government Bank needs to keep its NPL ratio low because if it goes up, the company's profits will decrease, and its performance will suffer (Sari et al., 2020). But, assuming interest, it must be ensured that this is not because of the high costs of transferring money from one person to another. NIM has been seen as a significant measure of a bank's health, Jha and Hui (2012) said it should be at least 4% for a bank to be healthy. The deposit ratio negatively affects net interest profit (Suu et al., 2020). Also, development banks are told to keep an excellent

credit-to-deposit balance (CDR) because it affects most performance measures. The result indicated that a bank's capital strength was found to have a high significance in affecting its performance and was considered less risky. This, in turn, would lead to the banks having higher profits.

Relevant theories and previous research findings in banking and finance will guide the study. These may include views on bank profitability, financial intermediation, and risk management. The theoretical framework will provide a foundation for understanding the relationships between the independent variables (CAR, CDR, and NPL) and the dependent variable (NIM) and helps to formulate the research framework and hypotheses, as presented in Figure 1.

Figure 1
Research Framework



Based on the research framework, this study aims to test the following hypotheses:

H1: There is a significant positive relationship between CAR and NIM.
H2: There is a significant positive relationship between CDR and NIM.
H3: There is a significant positive relationship between NPL and NIM.

Research methodology

A descriptive and causal-comparative research design is used to achieve the research objective. In descriptive research design, minimum, maximum, mean, and standard deviation were calculated for the variables in this study. In addition, regression analysis was used in the causal-comparative research design. The population of this study was all the commercial banks of Nepal. The study used convenient sampling techniques and chose ten commercial banks as a sample for the analysis. Based on the five years data of each bank, the total number of observations was 50 for the study. Therefore, the study was based on secondary data. Data has also been obtained from financial reports from publicly listed banks, published and unpublished publications, research journals, business and financial media, and other magazines and corporate journals. This study has been based on time series data extracted from annual reports for the five years from 2014/15 to 2018/19.

This study used financial, statistical, and performance analysis tools and techniques. Table 1 shows the financial instruments used in this study.

Table 1
Data analysis tools

Variables	Formula
Non-Performing Loan	$\frac{\text{Non-Perfoming Loan}}{\text{Total Amount of Outstanding Loans}}$
Credit- Deposit Ratio	$\frac{\text{Total Loan Disbursements}}{\text{Total Deposit Collection}}$
Capital Adequacy Ratio	$\frac{\text{Tier I Capital + Tier II Capital}}{\text{Risk Weighted Assets}}$
Net interest Margin	$\frac{\text{Interest Revenue - Interest Expenses}}{\text{Averate Earning Assets}}$

This study primarily employed statistical tools such as mean, standard deviation, minimum, maximum, or descriptive statistics, and regression analysis.

The models used for regression analysis are presented as follows:

$$NIM_{it} = \alpha + \beta_1 (NPL_{it}) + \beta_2 (CDR_{it}) + \beta_3 (CAR_{it}) + \varepsilon_{it}$$

Where,

NIM = Net Interest Margin
NPL = Non-Performing Loan
CDR = Credit to Deposit Ratio
CAR = Capital Adequacy Ratio
α = A constant; equals the value of Y when the value of all independent variables are equal to zero.
β_1 = the coefficient of the independent variable NPL and it represents the change in the value of NIM for a unit increment in the value of NPL.
β_2 = the coefficient of the independent variable CDR and it represents the change in the value of NIM for a unit increment in the value of NIM.
β_3 = the coefficient of the independent variable CAR and it represents the change in the value of NIM for a unit increment in the value of CAR.
ε_{it} = Random error

Results

This section aims to comprehensively analyze the determinants of Net Interest Margin (NIM) in Nepalese commercial banks through descriptive and regression analysis. The descriptive analysis involves examining the characteristics and trends of the variables of interest. At the same time, regression analysis allows to assess the relationships between the independent variables (Capital Adequacy Ratio, Credit-Deposit Ratio, and Non-Performing Loan) and the dependent variable (NIM).

Table 2
Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CAR	50	8.63	16.88	12.76	1.43
CDR	50	64.43	92.75	81.87	7.29
NPLR	50	0.06	3.22	1.10	0.73
NIM	50	3.36	14.38	9.94	2.33

Table 2 shows that the average capital adequacy of the banks in the sample is 12.76 %, with some variation around this mean; the banks have a credit-deposit ratio of 81.87 %, indicating a relatively high proportion of their deposits being utilized for lending activities. Banks in the sample have a non-performing loan ratio of 1.10 %, which represents the proportion of loans that are in default or at risk of default; the result signifies that, on average, the banks in the sample have a net interest margin of 9.94 %, representing the difference between interest income earned and interest expenses paid. Based on the descriptive statistics, it can be observed that the mean values for CAR, CDR, NPLR, and NIM provide an understanding of the average levels of these variables in the sample. The standard deviations also indicate the variability or dispersion around the mean.

The empirical regression model was used in this study, and the regression analysis results are presented in Table 3. The regression analysis will provide estimates of the regression coefficients, indicating the direction and magnitude of the relationships between the independent variables and NIM.

Table 3
Regression results

Model Summary:

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.416	.173	.120	2.17435

ANOVA:

		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	46.474	3	15.491	3.277	.029[b]
	Residual	222.206	47	4.728		
	Total	268.681	50			

Coefficients:

Model		Unstandardized Coefficients		Standardized Coefficients	t-value	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-2.608	4.276		-.610	.545		
	CAR	.170	.232	.104	.733	.467	.874	1.144
	CDR	.122	.043	.385	2.813	.007	.942	1.062
	NPLR	.338	.440	.107	.767	.447	.913	1.095

Predictors: (Constant), CAR, CDR, NPLR
Dependent Variable: NIM

Table 3 shows that the coefficient of multiple determination (R2) is 0.120, indicating that the model's independent variables account for approximately 12.0 % of the dependent variable (NIM) variance. The model fits data on the independent variables on NIM since $F(3, 47) = 3.277$, $p < 0.05$ indicates that the model is statistically significant. A p-value less than 0.05 is commonly used to determine statistical significance, indicating that CAR, CDR, and NPLR are collectively significant predictors of NIM, whereas, in the case-wise analysis, CAR and NPLR have no significant impact on NIM. Furthermore, there were no multi-collinearity issues since the variance inflation factors (VIF) values did not exceed the threshold value of 4.0, as suggested by (Hair et al., 2010).

Discussion

The current findings of this study regarding the determinants of NIM in Nepalese commercial banks can be compared and contrasted with previous research in the field. Pham and Nguyen (2017) found a positive effect of NIM and liquidity on the CAR. The study suggested higher NIM and liquidity levels improve banks' capital adequacy. However, the present study did not find a significant relationship between CAR and NIM in Nepalese commercial banks. This discrepancy may be due to differences in the banking systems and specific factors influencing NIM across countries. Silaban (2017) concluded that CAR does not significantly affect bank profitability. This finding aligns with the current study's results, which found that CAR did not substantially impact NIM in Nepalese commercial banks. Both studies imply that while CAR is crucial for financial stability and risk management, it may not directly influence NIM.

Similarly, the present study did not find a significant relationship between NPLR and NIM in Nepalese commercial banks. This suggests that NPLs may not directly impact NIM in the context of these banks. Raharjo et al. (2014) found that internal variables, including capital adequacy and liquidity, influenced the NIM of Indonesian commercial banks at varying levels of significance. Although the present study focused on Nepalese

commercial banks, the similarity lies in the importance of internal variables in determining NIM. Capital adequacy and liquidity are vital considerations in analyzing NIM across different banking systems. Sari et al. (2020) emphasized the significance of managing the NPL ratio to maintain profitability and overall performance. Their findings align with the importance of effective risk management practices highlighted in the present study, even though NPLR did not significantly impact NIM in this sample. Jha and Hui (2012) stated that NIM is an essential measure for banks, with a minimum threshold of around 4 % for a healthy bank. This benchmark provides a reference for evaluating the NIM levels in Nepalese commercial banks, although the present study did not specifically address this threshold. Suu et al. (2020) found an inverse relationship between the Deposit Ratio and NIM, suggesting that a higher Deposit Ratio leads to lower NIM. This finding contrasts with the present study, which did not find a significant relationship between the CDR and NIM in Nepalese commercial banks. These divergent results might be due to differences in the banking systems and specific factors affecting NIM in different countries.

Finally, comparing the current findings with previous research reveals similarities and differences. While some studies found significant relationships between NIM and factors such as liquidity, capital adequacy, and non-performing loans, the present study found a significant impact only for the CDR on NIM in Nepalese commercial banks. These differences may arise from variations in the banking systems, sample characteristics, and specific factors influencing NIM across different countries. Nonetheless, the importance of effective risk management, maintaining financial stability, and optimizing the credit-deposit relationship remain common themes in discussions on NIM and bank profitability.

Conclusion

In conclusion, the study findings suggest that the CDR significantly impacts the NIM in Nepalese commercial banks. A higher CDR indicates a higher utilization of deposits for lending activities, which can lead to increased interest income and, ultimately, higher NIM. On the other hand, the CAR and NPLR did not show statistically significant relationships with NIM in this sample.

These results imply that managing the credit-deposit relationship is crucial for enhancing NIM in Nepalese commercial banks. Banks should aim to strike a balance between lending activities and deposit mobilization to optimize their interest income. Maintaining a solid capital base and effective risk management practices to control non-performing loans are vital for overall financial stability, although these factors may not directly impact NIM. It is important to note that the findings of this study are based on the analysis of a specific sample of Nepalese commercial banks and the variables included in the regression model. The results may not generalize to all commercial banks in Nepal or other countries. Therefore, caution should be exercised when applying these findings to different contexts. This study contributes to the existing literature on bank profitability by providing insights into the determinants of NIM in the specific context of Nepalese commercial banks.

Further research can expand on this study by incorporating additional variables, such as interest rate spreads or macroeconomic factors, to better understand the factors influencing NIM. The findings of this study have implications for policymakers, banking regulators, and commercial banks in Nepal. They highlight the importance of monitoring and managing the credit-deposit relationship to optimize profitability and ensure financial stability in the banking sector. Overall, this study sheds light on the factors influencing NIM in Nepalese commercial banks and provides a foundation for further research and discussions in banking and finance. It is important to note that these interpretations are based on the given statistical analysis, and other research and robustness checks may be needed to understand the determinants of NIM in Nepalese commercial banks fully.

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