Impact of Credit Risk, Liquidity Risk, and Operational Risk on Commercial Bank's Profitability

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ABSTRACT

The major objective of the study is to examine the impact of bank specific risk factors such as credit risk, liquidity risk, and operational risk on commercial bank's profitability operated in Nepali money market. The study consists of descriptive and causal comparative research design. All the data are collected from the annual reports of nine sample banks for 15 years from mid-July 2009 to mid-July 2023 with 135 observations. The explained variables are return on assets and the return on equity whereas the explanatory variables are capital adequacy ratio, non-performance loan, leverage, cost to income ratio, loan loss provision, and loan to deposit ratio. The research methods used for the study consists of descriptive statistics, correlation analysis, and regression analysis. The results confirmed that capital adequacy ratio, non-performing loan, cost to income ratio, and loan loss provision have the significant negative impact on commercial bank's profitability. In contrast, leverage ratio has the significant positive impact on return on equity only. Loan to deposit ratio do not has any significant impact on profitability. More clearly, credit risk and operational risk both have the significant negative impact whereas liquidity risk has the significant positive impact on commercial banks operated in Nepali money market. The policy makers involving in the money market and the executives taking decisions can be beneficiated from the findings if they consider these findings for their day-to-day practices.

Keywords: Bank profitability, credit risk, liquidity risk, operational risk

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1. INTRODUCTION

The banking sector plays a major role in the economic development of a country by facilitating financial intermediation, providing credit and promoting investment. Commercial banks are the key players in the financial sector, contributing significantly to the country's economic stability and growth. As financial intermediaries, banks are essential to the functioning of the economy (Poudel et al., 2022). However, the profitability of the commercial banks is influenced by the various risks such as credit risk, liquidity risk, and operational risk. Examining the impact of these risks on bank profitability is crucial for effective risk management, regulatory oversight, and policy formulation. The essence of banking lies in managing risks rather than eliminating the risk (Mendoza and Rivera, 2017).

Michael et al. (2006) examined that credit risk as measured by non-performing loan negatively affect operational efficiency and the solvency position of banks. Similarly, Kargi (2011) examined that the profitability is negatively affected by the amount of loans and the advances, as well as by the presence of non-performing loans. Likewise, Pradhan (2019) argued that the high exposure of the credit risk significantly effects on the operational performance of the Nepali commercial banks. However, some empirical studies have found contradictory results and examined that credit risk has the significant positive impact on bank performance such as Hosna et al. (2009), Afriyie and Akotey (2012), and Boahene et. al. (2012). Therefore, credit risk management practices are crucial for consistency on the bank profitability in the long run.

Similarly, the liquidity risk is also an important issue in predicting commercial bank profitability. Shrestha (2020) argued that the relationship between liquidity risk and profitability is complex. Chaudhary et al. (2022) examined that the risk factors, loan growth, and efficiency negatively effect on bank profitability. Therefore, the trade-off between liquidity and profitability necessitates careful liquidity management to optimize the balance between risk and return.

Operational risk, on the other hand is another critical factor influencing the profitability of commercial banks. Shrestha (2022) examined that bank with more robust operational risk management practices tended to have higher profitability, underscoring the importance of strengthening these frameworks. Similarly, Mishra (2021) examined that operational risk particularly those related to technology and human error, have become more pronounced in recent years as Nepali banks have expanded their digital banking services. Among the operational risk, Mathuva (2009) examined that the cost to income ratio inversely related to the bank profitability. Likewise, Nusantara (2009) examined that a high level of operational cost decreases the potential profit, as these expenses are subtracted from revenue on the income statement, leading to a decline in financial performance and suggesting poor financial results for the bank. In the same way, some of the prominent empirical studies identified that loan loss provision and loan to deposit ratio can play the significant role in predicting bank profitability. For example, Sufian (2011), UI-Mustafa *et al.* (2012), and Bonaldi, et al. (2023) examined the negative impact of loan loss provision on commercial bank's profitability. Similarly, Kaaya and Pastory (2013) also investigated that the substantial negative effect of loan loss provisions on profitability in commercial banks in Tanzania. Hadian and Phety (2021), and Hapsari (2018) examined that loan to deposit ratio has the significant positive impact on bank profitability.

The aforementioned discussions emphasize the notable differences in empirical evidences concerning the effects of credit risk, operational risk, and liquidity risk on bank performance.

Despite existing empirical evidence from global money market, there is still a lack of recent data supporting these findings specifically in the context of Nepal. Therefore, this study aims to address the existing gap in literature by providing the valuable empirical evidences how such risks effect on the profitability of banks operated in Nepali money market. In doing so, the study is conducted with the data set obtained from the income statement of nine sample banks for 15 years with 135 observations. The results observed that capital adequacy ratio, non-performing loan, cost to income ratio, and loan loss provision have the significant negative impact on commercial bank's profitability. On the other hand, leverage ratio has the significant positive impact on return on equity only. Loan to deposit ratio do not has any significant impact on profitability.

2. METHODS

This study adopted descriptive and casual comparative research design. The descriptive research design has been used to describe the different phenomenon relating to commercial banks profitability and the risk associated in commercial banking sector. Similarly, the casual comparative research design has been employed to investigate the extent and direction of the influence of banking risk factors on profitability. Total twenty commercial banks have been operating in Nepali money market till 1st Jan 2024. Among them, total of nine commercial banks have been chosen as the sample. The sample banks included in the study are NIC Asia Bank Limited, Global IME Bank Limited, Himalayan Bank Limited, Nabil Bank Limited, Kumari Bank Limited, Siddhartha Bank Limited, Laxmi Sunrise Bank Limited, NMB Bank Limited, and Everest Bank Limited. Each bank was observed over the period 2008/09 to 2022/23, with a total of 15 observations per bank. In aggregate, the dataset comprises 135 observations across the nine banks.

The secondary database from the set of nine sample commercial banks operated in Nepali banking industry. The study is based on a dataset covering 15 years from mid-July 2009 to mid-July 2023, comprising 135 observations. All the data have been collected form the annual report of the selected banks. The data were analyzed by using the statistical software SPSS-27. The statistical techniques adopted for the study were descriptive analysis, correlation analysis, and the pooled OLS method of regression analysis. The overall significance of the model is examined by using the F-test in ANOVA analysis. The goodness of fit of the model is examined by adjusted-R^2. The regression model used for the study is explained in equation 1 and 2.

$$ROA_{it} = \beta_1 + \beta_2 CAR_{it} + \beta_3 NPL_{it} + \beta_4 LEV_{it} + \beta_5 CTI_{it} + \beta_6 LLP_{it} + \beta_7 LDR_{it} + \varepsilon_{it} \quad \ldots (1)$$
$$ROE_{it} = \beta_1 + \beta_2 CAR_{it} + \beta_3 NPL_{it} + \beta_4 LEV_{it} + \beta_5 CTI_{it} + \beta_6 LLP_{it} + \beta_7 LDR_{it} + \varepsilon_{it} \quad \ldots (2)$$

The explanation of all explanatory and the explained variables were described in detail with the expected direction of the impact in the following section.

Dependent Variables

The dependent variable used for the study is profitability. Most common measures of profitability are return on assets (ROA) and the return on equity (ROE). Therefore, this study used both ROA and ROE as the explained variables.

Return on Assets (ROA)

ROA is the ratio between net profit after tax and the total assets. ROA is one of the fundamental financial ratios that is used to determine how profitable a company is for the total assets employed. Symbolically:

$$ROA = Net\ Income/\ Total\ Assets \qquad \qquad ...\ (3)$$

Return on Equity (ROE)

Return on equity (ROE) is also considered as the dependent variable. Return on equity measures the rate of return to investors of the common stock. ROE indicates the company's ability to generate profits from the investments made by its equity holders. Mathematically, return on equity is the ratio of net profit after tax to shareholders' equity. Symbolically:

$$ROE = Net\ Income/Shareholders\ Equity \qquad \qquad ...\ (4)$$

Independent Variables

The explanatory variables used for the study are the different types of risk inheriting with the commercial banks. Credit risk, operational risk, and the liquidity risk are the most common risk factor in the commercial banks. Therefore, this study used all three measures of the risk as the explanatory variables.

Capital Adequacy Ratio (CAR)

The capital adequacy ratio is the proportion of capital funds to risk weighted exposures. This ratio measures the financial strength and the soundness of the commercial bank. It also measures the risk bearing capacity of the commercial banks. Symbolically:

$$CAR = Capital\ Fund/\ Risk\ Weighted\ Assets \qquad \qquad ...\ (5)$$

Capital fund is the sum of Tier I and Tier II capital. Similarly, 'risk-weighted assets' denotes to a system used to classify assets in order to determine the minimum capital that the bank must hold in reserve to minimize the risk of insolvency. All the data of risk weighted assets were directly retrieved from the annual report of the selected banks. Ramadhanti, et al. (2019), Nguyen (2020) and Poudel et al. (2022) examined the significant positive impact of CAR on profitability of the commercial banks. Hence, the hypothesis purposed is as follows:

H_1: Capital adequacy ratio has the significant positive impact on performance.

Credit Risk/Non-Performing Loan Ratio (NPL)

The most important indicator of credit risk of commercial bank is non-performing loan. Non-performing loan is the chances of losing investment or routine receivable instalments. It refers to the potential financial loss that may occur if a borrower fails to fulfill their obligations under an agreement, leading to adverse effects on the bank's financial performance. In financial term, non performing loan is the proportion of nonperforming loan on total loan. Symbolically:

$$NPL = Nonperforming\ Loan\ /\ Total\ Loan \qquad \qquad ...\ (6)$$

Michael *et al.* (2006) examined that non performing loan negatively effect on the operational performance of banks. Similarly, Kargi (2011) examined that non performing loan have an inverse impact on profitability. Likewise, Kusuma (2013), Attar and Islahuddin (2014), Kadioglu and Ocal (2017) examined a significant negative impact of credit risk on performance of banks. Poudel (2018) investigated that the significant negative effect of non-performing loan on profitability in Nepali commercial banks. Hence, the purposed hypothesis is:

H_2: Credit risk has the significant negative impact on bank's performance.

Leverage (LEV)

Leverage is the proportion of long-term loan on total assets. It indicates that how much of the total assets of the firm is financed by the debt. The higher the financial ratio reveals that the firm

has been operating with the higher proportion of the debt. Therefore, leverage is the proportion of long-term loan to total assets. Symbolically:

Leverage = Long-term Loan/Total Assets. . . (7)

Al-Husainy et al. (2021) examined that the significant positive impact of leverage on bank performance. In contrast, Darlami (2023) examined the significant negative impact of leverage on bank profitability. Based on the Darlami (2023) findings, the proposed hypothesis is:

H_3: Leverage has the significant negative impact on bank performance.

Cost to Income Ratio (CTI)

Cost to income ratio indicates the operational quality or risk of the firm. Tripe (1998) suggested that cost to income ratio is the emerging measure of bank's efficiency and a benchmarking metric. Therefore, CTI is considered as the operating risk for the study. Cost to income ratio is the proportion of operating cost on total income. Symbolically:

CTI = Operating Cost / Total Income . . . *(8)*

Mathuva (2009) examined that the cost to income ratio inversely related to the bank profitability. Similarly, Nusantara (2009) examined higher operating costs reduces the commercial banks profitability. Based on these evidences, the hypothesis is:

$H4$: CTI ratio has the significant negative effect on bank's performance.

Loan Loss Provision (LLP)

The loan loss provision is the amount of loan repayments that banks reserve to cover potential losses from defaulted loans. It enables the bank to manage its income and remain resilient during challenging periods, and is listed as a non-cash expense on the income statement. It measures the credit quality of bank as well. If a bank operates in a risky environment and fails to manage its lending activities properly, it will likely face a higher loan loss provision to mitigate the associated risks (Ahmad, et al., 2014). It is determined by dividing the loan loss provision by total loan amount of loan. Symbolically:

LLP = Loan-loss Provision / Total Loan . . . *(9)*

Sufian (2011), UI-Mustafa *et al.* (2012), and Bonaldi, et al. (2023) examined the negative impact of loan loss provision on commercial bank's performance. Similarly, Kaaya and Pastory (2013) examined the significant negative impact of loan loss provision on profitability in commercial banks. Based on these finding, the research hypothesis for the study is as follows:

H_5 : Bank performance is significant and negatively affected by loan loss provision.

Loan to Deposit Ratio (LDR)

The loan-to-deposit ratio evaluates how risky a bank's funding strategy is. It is calculated as the proportion of long-term loan provided by the bank on the total deposit collected by the bank. Symbolically:

LDR = Long Term Loan / Total Deposit . . . *(10)*

Total deposit is the sum of demand deposit, saving deposit, and time deposit. Hadian and Phety (2021) examined that the loan proportion on deposit has the significant positive impact on bank profitability. Similarly, Hapsari (2018) examined that bank profitability is positively affected by long term deposit ratio. Based on the existing evidences, the hypothesis is:

H_6 : LDR has the significant positive impact on commercial bank's return.

Table 1

Definition of the Variables and Expected Outcomes

Variables	Definition	Expected sign
Return on assets (ROA)	Net profit after tax / Total assets	
Return on equity (ROE)	Net profit after tax/Shareholders' equity	
Capital adequacy ratio (CAR)	Shareholders' equity / Risk weight assets	+
Leverage (LEV)	Long-term loan/Total assets	-
Cost to income ratio (CTI)	Operating cost / Total income	-
Loan loss provision (LLP)	Loan loss provision / Total loan	-
Loan to deposit ratio (LDR)	Long term loan / Total deposit	-

Table 1 shows the functional description of the explanatory variables and the hypothesis. The expected sign indicates that the relationship and the expected direction of the impact of independent variables on the dependent variable. '+' indicates that the variables have the significant positive effect on performance. '-' indicates that the variables have the significant negative effect on performance. The explained variable is bank's profitability measured by return on assets and return on equity. The explanatory variables are the risk factors associated with the commercial banks such as capital adequacy ratio, leverage, cost-to-income ratio, loan-loss provision, and loan-to-deposit ratio. It is assumed that all the risk factors have the significant negative effect on performance except capital adequacy ratio.

3. RESULTS AND DISCUSSION

The results obtained from the analysis is presented in four sections. Firstly, descriptive statistics of the variables are described. Secondly, the results from the correlation analysis were shown. And, the lastly, the results obtained from multiple regression were presented and analyzed.

Analysis of Study Variables

This section described about the statistical properties of the variables for the study from all nine sample banks from mid-July 2009 to mid-July 2023 with 135 observations. The results obtained from the descriptive statistics are presented in Table 2.

Table 2

Descriptive Statistics of Bank-Specific Variables and Banks Profitability

Variables	Mean	SD	Minimum	Maximum	n
ROA (%)	1.47	0.55	0.14	3.25	135
ROE (%)	16.20	6.87	1.47	37.56	135
CAR (%)	11.57	2.28	4.99	20.41	135
NPL (%)	1.50	1.09	0.07	4.96	135
LEV (%)	90.39	1.80	85.23	94.04	135
CTI (%)	72.89	9.72	42.39	93.56	135
LLP (%)	2.26	0.83	1.05	5.19	135
LDR (%)	83.42	7.22	64.43	104.03	135

Note. n is the number of observations.

Table 2 presents the values from the descriptive analysis of the variables. Descriptive analysis includes the value for the minimum, maximum, mean and standard deviation of the dataset used in the study. The return on assets ranges from minimum 0.14 percent to maximum 3.25 percent with mean 1.47 percent and standard deviation 0.55 percent. Similarly, return-on-equity ranges from minimum 1.47 percent to maximum 37.56 percent with average 16.20 percent and standard deviation 6.87 percent. The average value of capital adequacy ratio is 11.57 percent with standard deviation 2.28 percent ranging from minimum 4.99 percent to 20.41 percent. The minimum and maximum values of NPL are 0.07 percent and 4.96 percent with mean 1.50 percent and standard deviation 1.09 percent. Similarly, the Leverage ratio ranges from minimum 85.23 percent to maximum 94.04 percent with mean 90.39 percent and standard deviation 1.80 percent. Average cost to income ratio is 72.89 percent with 9.72 percent standard deviation ranging from minimum 42.39 percent to maximum 93.56 percent. Likewise, loan loss provision ranges from minimum 1.05 percent to maximum 5.19 percent with mean 2.26 percent and standard deviation 0.83 percent. And, the average loan to deposit ratio is 83.42 percent with standard deviation 7.22 percent ranging from minimum 64.43 percent to maximum 104.03 percent.

Relationship among the Variables

The results obtained from the correlation analysis were presented and analyzed. The correlation analysis examines the direction of the relationship between the variables. Table 3 shows the Pearson's correlation coefficients among the variables.

Table 3

Relationship between Bank Specific Variables and Banks Profitability

	ROA	ROE	CAR	NPL	LEV	CTI	LLP	LDR
ROA	1							
ROE	.914**	1						
CAR	-0.165	-.399**	1					
NPL	-0.069	-0.164	0.050	1				
LEV	0.080	.415**	-.626**	-0.145	1			
CTI	-.446**	-.380**	-0.067	-.232**	-0.049	1		
LLP	-.184*	-.248**	-0.043	.874**	-0.076	-0.144	1	
LDR	-0.146	-.221**	.203*	-.315**	-.308**	.487**	-.236**	1

The correlation between capital adequacy ratio and both the proxies of bank profitability are negative (ROA = -0.165 & ROE = -0.399**). The negative correlation between CAR and profitability suggest that CAR has the negative relationship with bank profitability. It means that higher the capital adequacy ratio, lower would be the bank profitability in Nepali banks. Similarly, the correlation coefficients of non-performing loan with bank profitability are negative (ROA = -0.069 & -0.164) which indicate that the relationship between non-performing loan and the bank profitability is negative. It suggests that, higher the non-performing loan, lower would be the bank profitability in Nepali banking sector.

Likewise, the relationship between cost to income ratio and profitability is found to be negative (ROA = -0.446** & ROE = -0.380**). The negative relationship further indicates that increase in cost to income ratio leads to decrease in bank profitability. It indicates that, higher the cost to income ratio, lower would be the bank performance. Regarding to loan loss provision, the correlation coefficients are also negative (ROA = -0.184* & ROE = -0.248**). The negative coefficients indicates that loan loss provision and bank profitability are negatively corelated. More clearly, higher the loan loss provision, lower would be the bank profitability. Similarly, the regression coefficients of loan to deposit ratio and profitability are also negative (ROA = -0.146 & ROE = -0.221**) which indicates that loan to deposit ratio has the negative relationship with profitability. It indicates that, higher the loan to deposit ratio, lower would be the bank profitability. In contrast, the correlation coefficients of leverage ratio with profitability are positive (ROA = 0.080 & ROE = 0.415**). The positive correlation coefficients further indicate that the relationship between leverage and bank profitability is positive. It indicates that, higher the leverage ratio, higher would be the bank profitability.

Impact of Liquidity Risk, Credit Risk and Operational Risk on Profitability

In order to identify the magnitude of impact of risk factors of banking industry on profitability, the ordinary least square (OLS) model of multiple regression analysis has been used. The results are shown in Table 4. The table presents the regression results for 135 observations from 2008/09 to 2022/23, with ROA (return on assets) and ROE (return on equity) as the dependent variables. The independent variables include CAR (capital adequacy ratio), NPL (non-performing loan-to-total loan), LEV (leverage ratio), CTI (cost-to-income ratio), LLP (loan loss provision), and LDR (long-term loan-to-deposit ratio). Regression results, including coefficients and standard errors (in parentheses), are reported.

Table 4

Impact of Bank-Specific Variables on Banks Profitability

Variables	Return on assets (ROA)				Return on equity (ROE)			
	Coefficients	t	P	VIF	Coefficients	t	P	VIF
Constant	20.402 (11.761)	1.735	0.085		-12.513 (11.685)	-1.071	0.286	
CAR	-0.829 (0.233)	-3.557	0.001	1.721	-0.993 (0.231)	-4.292	0.000	1.721
NPL	-0.231 (0.092)	-2.526	0.013	4.874	-2.596 (1.058)	-2.454	0.016	4.874
LEV	-2.823 (2.367)	-1.193	0.235	1.855	5.087 (2.351)	2.163	0.032	1.855
CTI	-1.820 (0.284)	-6.413	0.000	1.376	-1.686 (0.282)	-5.981	0.000	1.376
LLP	-0.710 (0.212)	-3.342	0.001	4.461	-0.805 (0.211)	-3.814	0.000	4.461
LDR	0.662 (0.512)	1.291	0.199	1.644	0.565 (0.509)	1.109	0.270	1.644
Model Summary	F	11.129	P	0.000	F	18.440	P	0.000
	R^2	0.343	SEE	0.403	R^2	0.464	SEE	0.400
	Adjusted R^2	0.312	DW	1.338	Adjusted R^2	0.438	DW	1.362

The model's significance is tested using ANOVA, where the F-test values for ROA (11.129) and ROE (18.440) are statistically significant at the 1 percent level (P = 0.000). Adjusted R-squared values of 0.312 (ROA) and 0.438 (ROE) indicate that the independent variables explain approximately 31.2 percent and 43.8 percent of the variation in bank profitability, respectively. Additionally, all VIF values are below 10, confirming the absence of multicollinearity.

Regression coefficients reveal that the capital adequacy ratio negatively and significantly affects profitability (ROA = -0.829, P = 0.001; ROE = -0.993, P = 0.000) at the 99 percent confidence level. These findings contradict previous studies by Ramadhanti et al. (2019), Nguyen (2020), and Poudel et al. (2022). Thus, there is insufficient evidence to support the research hypothesis.

Similarly, regression coefficients of non-performing loan are negative and statistically significant (ROA = -0.231, P= 0.013; ROE = -2.596, P = 0.016) at 5 percent level of significance level. The significant negative coefficients indicates that non-performing loan has the significant negative effect on bank profitability. It indicates that, higher the non-performing-loan, lower would be the commercial bank's performance in Nepali banking industry. The result is consistent with the existing literatures such as Michael et al. (2006), Kargi (2011), Kolapo et al. (2012), Ozurumba (2016), Poudel (2018), and Cetin (2019). The results and discussions confirmed that, there is sufficient evidences in favor of research hypothesis.

Likewise, regression coefficients of cost to income ratio are negative and statistically significant (ROA = -1.820, P=0.000; ROE = -1.686, P=0.000) at 99 percent confidence level. The significant negative coefficients indicate that cost to income ratio has the significant negative effect on profitability. It indicates that, higher the cost-to-income ratio, lower would be the commercial banks performance in banking industry. This finding is consistent with the finding of Mathuva (2009) and Nusantara (2009) therefore, there are the sufficient supportive information in favour of research hypothesis.

In the same way, the regression coefficients of loan-loss-provision on bank profitability are negative and statistically significant (ROA = -0.710, P= 0.001; ROE =-0.805, P = 0.000) at 1 percent level of significant which suggest that loan-loss-provision has the significant negative effect on performance. More clearly, higher the loan loss provision, lower would be the profitability. Present finding is consistent with the existing body of the literature such as UI-Mustafa et al. (2012) and Bonaldi, et al. (2023). Therefore, there are the sufficient evidences to support the research hypothesis for the study.

On the other hand, the beta coefficient of leverage on ROE is positive (5.087) and significant (P = 0.032) at 5 percent alfa level. However, the regression coefficient of leverage on ROA is negative (-2.823) and insignificant (P = 0.235) at 5 percent alfa level. The significant positive coefficient of ROE indicates that leverage ratio has the significant positive impact on return on equity only. It means that, higher the leverage ratio, higher would be the return on equity in Nepali banks. This finding supports the findings of Al-Husainy et al. (2021), however, contradicts with the findings of Darlami (2023) and Darlami (2023).

Regarding the loan to deposit ratio, the regression coefficients are statistically insignificant (ROA = 0.119 & ROE = 0.270). The insignificant coefficients indicate that loan-to-deposit ratio has the insignificant effect on profitability. Hence, there is no any empirical evidence to support the research hypothesis.

4. CONCLUSION

This study is conducted with the objective to examine the impact of risk factors of commercial banks on profitability. The measures of profitability are return on assets and the return on assets. In the same way, the measures of risk factors are credit risk, liquidity risk, and the operational risk. The study is completely based on the secondary dataset from the sample of nine banks operated in Nepali money market. The study covers the data set for 15 years from mid-July 2009 to mid-July 2023 with 135 observations. All the data were collected from the financial reports of the selected banks. Descriptive analysis, correlation, and the pooled OLS method were used as the methods of data analysis. The findings confirmed that the capital adequacy ratio, non-performing loan, cost-to-income ratio, and loan-loss-provision have the significant negative impact on profitability. However, leverage ratio has the significant positive impact on return on equity only. Regarding the loan to deposit ratio, it has the insignificant impact on commercial bank's profitability. More clearly, credit risk and operational risk both have the significant negative impact whereas liquidity risk has the significant positive impact on commercial banks. The policy makers involving in the money market and the executives taking decisions can be beneficiated from the findings if they consider these findings for their day-to-day practices. Similarly, this study also provides big literature support to the upcoming researchers.

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REFERENCES

Afriyie, H. O., & Akotey, J. O. (2012). Credit risk management and profitability of selected rural banks in Ghana. *Ghana: Catholic University College of Ghana*, *7*(4), 176-181.

Ahmad, F., Tahir, S. H., & Aziz, B. (2014). Impact of loan loss provision on bank profitability in Pakistan. *TIJ's Research Journal of Social Science and Management, 3*(12), 34-41.

Al-Husainy, N. H. M., & Jadah, H. M. (2021). The effect of liquidity risk and credit risk on the bank performance: Empirical evidence from Iraq. *IRASD Journal of Economics, 3*(1), 58-67.

Attar, D., & Islahuddin, M. S. (2014). Pengaruh penerapan manajemen risiko terhadap kinerja keuangan perbankan yang terdaftar di Bursa Efek Indonesia. *Jurnal Administrasi Akuntansi: Program Pascasarjana Unsyiah, 3*(1), 10-20.

Boahene, S. H., Dasah, J., & Agyei, S.K. (2012). Credit risk and profitability of selected banks in Ghana. *Research Journal of Finance and Accounting*, *3*(7), 6-14.

Bonaldi, P., Liang, P. J., & Yang, L. (2023). Did CECL improve banks' loan loss provisions and earnings quality during the Covid-19 pandemic? *Available at SSRN 4360356.*

Cetin, H. (2019). The relationship between non-performing loans and selected EU members banks profitability. *International Journal of Trade, Economics and Finance, 10*(2), 52-55.

Darlami, S. (2023). Impact of credit risk, operational risk and liquidity risk on the profitability of Nepalese commercial banks. *Perspectives in Nepalese Management*, 107-120.

Gieseche, K. (2004). Credit risk modeling and valuation: An introduction. *Credit Risk: Models and management, 2,* 1-40.

Hadian, N., & Phety, D. T. O. (2021). The effect of non-performing loans and loan to deposit ratio on return on assets in the banking industry. *Turkish Journal of Computer and Mathematics Education, 12*(8), 791-798.

Hapsari, I. (2018). Moderating role of size in the effect of loan to deposit ratio and non-performing loan toward banking financial performance. *Advances in Social Science, Education and Humanities Research, 231,* 351-354.

Hosna, A., Bakaeva, M., & Juanjuan. S. (2009). Credit risk management and profitability in commercial banks. *Gothenburg: School of Business, Economics and Law, University of Gothenburg*, Master Degree Project No. 2009:36.

Kaaya, I., & Pastory, D. (2013). Credit risk and commercial banks performance in Tanzania: A panel data analysis. *Research Journal of Finance and Accounting, 4*(16), 55-62.

Kadioglu, E., & Ocal, N. (2017). Effect of the asset quality on the bank profitability. *International Journal of Economics and Finance, 9*(7), 60-68.

Kargi, H.S. (2011). *Credit risk and the performance of Nigerian banks*. Ahmadu Bello University.

Kolapo, T.F., Ayeni, R.K., & Oke, M.O. (2012). Credit risk and commercial banks' performance in Nigeria: A panel model approach. *Australian Journal of Business and Management Research, 2*(2), 31–38.

Kusuma-Wardhani, D. (2013). Pengaruh Rasio Efisiensi, Rasio Risiko, Rasio Likuiditas, dan Rasio Permodalan Terhadap Kinerja Bank BMRI, BRI, BCA, BNI, dan CIMB NIAGA. *Jurnal Jibeka*, *7*(2), 32-37.

Mathuva, D. M. (2009). Capital adequacy, cost income ratio and the performance of commercial banks: The Kenyan scenario. *The International Journal of Applied Economics and Finance*, *3*(2), 35-47.

Mendoza, R. R., & Rivera, J. P. R. (2017). The effect of credit risk and capital adequacy on the profitability of rural banks in the Philippines. *Scientific Annals of Economics and Business*, *64*(1), 83-96

Michael, J.N., Vasanthi, G., & Selvaraju, R. (2006). Effect of non-performing assets on operational efficiency of central-cooperative banks. *Indian Economic Panorama*, *16*(3), 33-39.

Mishra, R. (2021). Profitability in commercial banks. *International Journal of Case Studies in Business, IT and Education*, *5*(1), 61-67.

Nguyen, T. H. (2020). Impact of bank capital adequacy on bank profitability under Basel II accord: Evidence from Vietnam. *Journal of Economic Development, 45*(1), 31-46.

Niraula, R. (2021). Effect of liquidity on financial performance of Nepalese commercial banks. *NCCS Research Journal*, 45-58.

NRB. (2020). *Nepal Rastra Bank directives on liquidity management*. Nepal Rastra Bank.

NRB. (2021). *Impact of COVID-19 on the Nepali banking sector*. Nepal Rastra Bank.

Nusantara, A. B. (2009). *Analisis pengaruh NPL, CAR, LDR dan BOPO terhadap profitabilitas bank (Perbandingan bank umum go publik dan bank umum non go publik di Indonesia periodetahun 2005–2007)* (Master's thesis). Diponegoro University. http://eprints.undip.ac.id/16298/

Ozurumba, B. A. (2016). Impact of non-performing loans on the performance of selected commercial banks in Nigeria. *Research journal of Finance and Accounting, 7*(16), 95-109.

Poudel, S. R. (2018). Impact of credit risk on profitability of commercial banks in Nepal. *Journal of Applied and Advanced Research, 3*(6), 161-170.

Poudel, S.R., Dahal, S., & Panthi, R. (2022). The role of financial ratios in predicting return on equity of commercial banks. *Pravaha, 28*(1), *53-62.*

Pradhan, S. (2019). Credit risk management of commercial banks in Nepal. *Journal of Business and Social Science Research*, *4*(1), 12-24.

Ramadhanti, C., Marlina, M., & Hidayati, S. (2019). The effect of capital adequacy, liquidity and credit risk to profitability of commercial banks. *Journal of Economics, Business, and Government Challenges, 2*(1), 71-78.

Shrestha, P. (2020). Impact of COVID-19 on microfinance institutions in Nepal. *Microfinance Journal of Nepal*, *3*(2), 34-48.

Shrestha, P. (2022). Effect of credit risk on profitability of Nepalese commercial banks. *Butwal Campus Journal*, *5,* 78-85.

Sufian, F. (2011). Profitability of the Korean banking sector: Panel evidence on bank-specific and macroeconomic determinants. *Journal of Economics and Management*, *7*(1), 43-72.

Tripe, D. (1998). *Cost to income ratios in Australasian banking*. Department of Finance, Banking and Property, College of Business, Massey University.

Ul Mustafa, A. R., Ansari, R. H., & Younis, M. U. (2012). Does the loan loss provision affect the banking profitability in case of Pakistan? *Asian Economic and Financial Review*, *2*(7), 772-783.