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Bank-Specific Variables Affecting Financial Performance of Commercial Banks

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Abstract

This study has investigated the influence of bank-specific variables on the financial performance of commercial banks in Nepal, focusing on Return on Assets (ROA). Employing both descriptive and causal research designs, data from five commercial banks - NABIL Bank Limited, NMB Bank Limited, Everest Bank Limited, Himalayan Bank Limited, and Sunrise Bank Limited - were analyzed. Bank size, Cash Reserve Ratio (CRR), Capital Adequacy Ratio (CAR), and Non-Performing Loan Ratio (NPLR) were examined in relation to ROA using secondary data sourced from published annual reports spanning from 2012/13 to 2021/22. The study found the coefficient for bank size showed a positive relationship, although statistically insignificant. Conversely, the coefficient for CAR exhibited a significant negative association with ROA, suggesting that higher capital adequacy is linked to lower ROA. The impact of CRR on ROA was negative but not statistically significant, while the NPLR coefficient suggested a negative relationship with ROA, though marginally statistically significant, indicating a potential adverse effect of non-performing loans on ROA that warrants further investigation. Therefore, Commercial banks should enhance their financial performance by optimizing their capital adequacy ratios, as lower CAR is linked to higher ROA. Additionally, they should implement strategies to minimize non-performing loans due to their negative impact on ROA. Further research should focus on identifying other potential bank-specific variables that may influence financial performance

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Introduction

The financial performance of commercial banks is a critical aspect of the banking industry, influencing economic stability and growth. This study aims to investigate the bank-specific variables that affect the financial performance of commercial banks. The banking sector plays a pivotal role in facilitating economic activities by mobilizing funds from surplus units to deficit units through lending and investment activities (Claessens, 2009). Financial performance metrics such as profitability, liquidity, asset quality, and capital adequacy are essential indicators of a bank's ability to generate returns for its shareholders while maintaining stability and fulfilling its financial obligations (Hasan & Marton, 2003).

Understanding the determinants of financial performance is crucial for bank management, policymakers, investors, and regulators to make informed decisions regarding resource allocation, risk management, and regulatory oversight (Berger & DeYoung, 1997). Moreover, in a dynamic and competitive banking environment, identifying the key factors that influence financial performance can provide banks with strategic insights to enhance their operational efficiency, market competitiveness, and long-term sustainability (Golinelli & Rovelli, 2007).

The financial performance of commercial banks is crucial for the stability and growth of the banking sector, as well as the overall economy. In Nepal, where the banking industry is rapidly evolving, understanding the bank-specific variables that influence financial performance is essential for ensuring the sector's resilience and efficiency. This study seeks to investigate the impact of bank size, cash reserve ratio (CRR), capital adequacy ratio (CAR), and non-performing loan ratio (NPLR) on the return on investment (ROI) of commercial banks in Nepal.

Bank size, often measured by total assets, reflects the scale and scope of a bank's operations (Berger & DeYoung, 1997). A larger bank size may lead to economies of scale and scope, potentially enhancing profitability (Maudos and Fernández de Guevara, 2004). Additionally, the cash reserve ratio (CRR) represents the portion of deposits that banks must hold as reserves with the central bank, impacting their ability to lend and invest (Freixas & Rochet, 2008). Meanwhile, the capital adequacy ratio (CAR) measures a bank's ability to absorb potential losses and maintain solvency, with higher ratios indicating greater financial stability (Boyd & De Nicolo, 2005). Furthermore, the non-performing loan ratio (NPLR) reflects the quality of a bank's loan portfolio and its risk exposure (Beck, Demirgüç-Kunt, & Merrouche, 2013). A higher NPLR may signal increased credit risk and potential losses, which can adversely affect profitability (Berger & DeYoung, 1997). The dependent variable, return on assets (ROA), evaluates the profitability of investments relative to their cost. Therefore, this study attempted to answer the research

question: What are the bank-specific variables that influence the financial performance (ROA) of commercial banks in Nepal? By examining the relationship between these independent variables and ROI, this study aims to analyze the bank-specific variables affecting financial performance (ROA) of commercial banks in Nepal.

Literature review

Various studies have been conducted on the bank-specific variables affecting financial performance of commercial banks. Studies by Berger, Hasan and Zhou (2010) and Beck, Demirgüç-Kunt and Levine (2006) emphasize the positive impact of bank size on profitability and efficiency, attributing it to economies of scale and scope. Similarly, research by Demirgüç-Kunt and Detragiache (1998) and Rajan and Srinivasan (2010) highlight the influence of the cash reserve ratio (CRR) on banks' liquidity positions and profitability. Additionally, studies by Boyd, De Nicolo and Loukoianova (2009) and Abu Mansor, and Radam (2015) underscore the importance of capital adequacy ratio (CAR) in enhancing financial resilience and profitability. Concerning the non-performing loan ratio (NPLR), research by Berger and DeYoung (1997) and Shin and Shin (2010) suggests its negative impact on bank profitability and capital adequacy.

Further insights from national perspectives, such as Sharma and Adhikary (2019) and Thapa, and Pokharel (2018) in Nepal, highlight the significance of these variables in the context of the country's banking sector, emphasizing the need for effective management strategies to optimize financial performance. In global perspectives. Berger, Hasan and Zhou (2010) found that larger banks tend to have higher profitability and efficiency due to economies of scale and scope. Similarly, Beck, Demirgüç-Kunt and Levine (2006) demonstrated that larger banks are better equipped to withstand financial shocks and have greater access to resources, contributing to their overall financial stability and performance. Demirgüç-Kunt and Detragiache (1998) and Beck, Demirgüç-Kunt and Levine (2006) suggests that changes in the CRR affect banks' liquidity positions and lending behavior, consequently influencing their profitability and risk exposure.

Furthermore, research by Huang, Boyd, De Nicolo and Loukoianova (2009) indicated that higher CAR levels are associated with lower probabilities of bank failure and higher returns on equity. Similarly, Demirgüç-Kunt and Detragiache (1998) found that banks with adequate capital buffers are better able to absorb losses and maintain investor confidence during periods of financial distress. Berger, Hasan and Zhou (2010) demonstrated that high levels of non-performing loans can erode bank profitability and capital adequacy, leading to increased credit risk and financial instability. Additionally, studies by Jimenez, Lopez, and Saurina (2009) and Beck et al. (2006) highlighted the importance of effective credit risk management

practices in mitigating NPLR-related risks and preserving bank profitability. In Asian perspective, Hasan and Marton (2003) on Indian banks found that larger banks tend to have higher profitability and efficiency, attributed to economies of scale and scope. Similarly, studies in China by Zhang and Qu (2007) and Feng, Serletis and Serletis (2012) revealed that larger banks enjoy competitive advantages in terms of market share, customer base, and access to funding, contributing to their overall financial strength and performance. Rajan and Srinivasan (2010) and Saha and Acharya (2017) found that changes in the CRR affect banks' liquidity positions and lending behavior, influencing their profitability and risk management practices.

Similarly, studies in China by Zhou, Zhang and Fan (2011) highlighted the role of CRR adjustments in balancing monetary policy objectives with banks' profitability goals, emphasizing the importance of effective liquidity management strategies. Abu Mansor and Radam (2015) and Ang, Nuruzzaman and Goh (2016) demonstrated that banks with higher CAR levels exhibit greater financial resilience and profitability, as they are better equipped to absorb losses and meet regulatory capital requirements. Similarly, research in Japan by Horiuchi, Shimizu and Taguchi (2013) highlighted the role of CAR in enhancing investor confidence and reducing the likelihood of bank failures during economic downturns. Shin and Shin (2010) and Park, Lee and Cho (2019) found that high NPLR levels negatively impact bank profitability and capital adequacy, signaling increased credit risk and financial distress.

Moreover, research in Indonesia by Gunadi, Hall, and Mulhern, C. (2016) highlighted the importance of proactive NPLR management strategies in preserving bank asset quality and sustaining long-term profitability. In national perspectives, Sharma, and Adhikary (2019) analyzed the impact of bank size on the financial performance of commercial banks in Nepal. Using regression analysis, the study found a positive and significant relationship between bank size, measured by total assets, and profitability indicators such as return on assets (ROA) and return on equity (ROE). Similarly, Shakya and Parajuli (2020) conducted a comparative study of large and small banks in Nepal, revealing that larger banks exhibited higher levels of profitability and operational efficiency compared to smaller banks. These findings underscore the importance of bank size as a determinant of financial performance in the Nepalese banking sector.

Thapa and Pokharel (2018) investigated the impact of the cash reserve ratio (CRR) on the liquidity and financial performance of commercial banks in Nepal. Their study utilized panel data analysis and found that changes in the CRR significantly influenced banks' liquidity positions and profitability levels. The findings suggested that maintaining an optimal CRR level is crucial for balancing liquidity requirements while maximizing profitability in the Nepalese banking context. Bhattarai and Paudel (2020) have explored the relationship between the capital adequacy ratio (CAR) and financial

performance indicators of commercial banks in Nepal. Using regression analysis, the study found a positive association between CAR levels and profitability measures such as return on assets (ROA) and return on equity (ROE). The results indicated that well-capitalized banks are better positioned to generate sustainable returns and withstand adverse market conditions, highlighting the importance of maintaining adequate capital buffers in the Nepalese banking sector. Sharma and Khanal (2017) conducted a study on the impact of the non-performing loan ratio (NPLR) on the financial performance of commercial banks in Nepal.

Their empirical analysis revealed a negative relationship between NPLR levels and profitability indicators such as return on assets (ROA) and return on equity (ROE). The findings suggested that high levels of non-performing loans can significantly impair bank profitability and stability, underscoring the importance of effective credit risk management practices in mitigating NPLR-related risks in the Nepalese banking sector. While numerous studies have examined the impact of bank-specific variables on the financial performance of commercial banks, there is a lack of research specifically focusing on the dynamic and evolving banking sector in Nepal.

Existing literature predominantly addresses broader contexts and developed economies, leaving a gap in understanding the unique challenges and opportunities within Nepal's banking industry. Furthermore, previous research often overlooks the potential interplay between these variables and external economic conditions, necessitating a more comprehensive investigation that includes both internal and external factors influencing bank performance in Nepal.

Based on the literature review, the conceptual framework was developed. The independent variables include bank size, cash reserve ratio (CRR), capital adequacy ratio (CAR), and non-performing loan ratio (NPLR). The dependent variable includes return on investment (ROI), evaluating the profitability of investments relative to their cost. These variables collectively form the conceptual framework (Figure. 1) for analyzing the determinants of financial performance among commercial banks in Nepal.

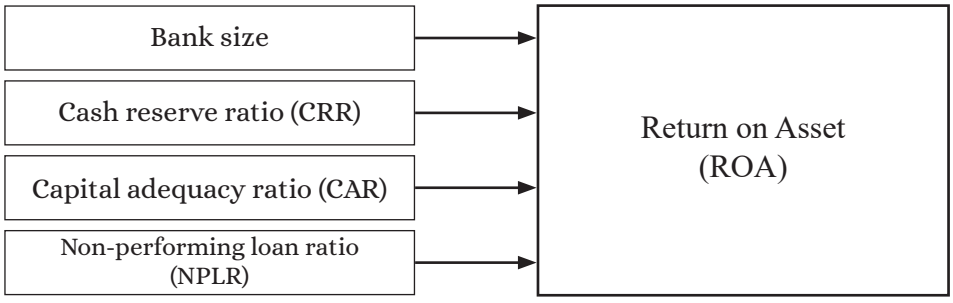

Figure 1: *Conceptual framework of the study*

Based on the conceptual framework of this study, four hypotheses were proposed:

H1: Bank size positively influences the ROA of commercial banks.

H2: CRR positively influences the ROA of commercial banks.

H3: CAR positively influences the ROA of commercial banks.

H4: NPLR negatively impacts the ROA of commercial banks in Nepal.

Methods

In this study, both descriptive and causal research designs were adopted to comprehensively investigate the bank-specific variables affecting the financial performance of commercial banks in Nepal. The descriptive research design was utilized to provide a detailed overview of variables such as bank size, CRR, CAR, NPLR, and return on investment (ROI) within the Nepalese banking sector. This approach facilitated the exploration of the characteristics, distribution, and relationships among these variables. Additionally, a causal research design was employed to establish cause-and-effect relationships between the independent variables (bank size, CRR, CAR, and NPLR) and the dependent variable (ROI), thereby elucidating the impact of bank-specific factors on financial performance. Out of the 20 commercial banks, five commercial banks were randomly chosen to form the sample for the study.

The selected banks include NABIL Bank Limited, NMB Bank Limited, Everest Bank Limited, Himalayan Bank Limited, and Sunrise Bank Limited. Random sampling ensures that each bank in the population has an equal chance of being selected, thereby enhancing the representativeness of the sample and allowing for generalizations to be made about the population of commercial banks in Nepal. In this study, bank-specific secondary data were collected from the published annual reports of the sample banks, spanning the period from 2012/13 to 2021/22. Additionally, relevant data for the analysis was gathered from previous reports and articles, including sources such as the Economic Survey by the Ministry of Finance, bank and financial statistics from the Nepal Rastra Bank (NRB), websites of specific banks, previous dissertations, newspapers, magazines, journals, finance books, and other relevant publications.

In this study, a combination of financial tools and statistical techniques was employed to analyze the data collected on bank size, CRR, Car, and NPLR in relation to the ROI of commercial banks. Descriptive statistics, including measures such as mean, standard deviation, and coefficient of variation, were computed to summarize the central tendency, dispersion, and relative variability of the variables under investigation. Additionally, inferential statistics techniques, such as correlation analysis, regression analysis, and hypothesis testing, were utilized to explore the relationships between the independent variables (bank size, CRR, CAR, NPLR) and the dependent

variable (ROI), and to test the research hypotheses. The utilization of both descriptive and causal research designs, alongside random sampling and comprehensive data collection spanning multiple years from various sources, facilitated a detailed examination of bank-specific factors impacting commercial banks' financial performance in Nepal, offers valuable insights for strategic decision-making in the dynamic landscape of the Nepalese banking sector.

Result

The analysis of the bank-specific variables across the selected commercial banks in Nepal reveals a diverse range of financial health indicators. Return on assets (ROA) varied considerably, indicating significant differences in profitability among the banks. Bank size (SIZE) showed consistency with moderate variability, suggesting stable growth patterns. Capital adequacy ratio (CAR) maintained a relatively narrow range, reflecting a generally sound capital base across the banks, although with some fluctuations. The cash reserve ratio (CRR) exhibited substantial variability, pointing to differing liquidity management strategies. The non-performing loan ratio (NPLR) displayed notable variation, highlighting divergent credit risk profiles and loan quality among the banks. Overall, these findings emphasize the importance of bank-specific strategies in shaping financial performance, with each variable contributing uniquely to the overall financial health and stability of the banks during the study period.

Table 1: Descriptive summary of variables

Variables	Minimum	Maximum	Mean	S.D	C.V	Observations
ROA	0.280	3.250	1.709	0.579	33.89	50
Bank size	4.270	5.460	4.954	0.286	5.77	50
CAR	10.750	15.750	12.657	1.416	11.19	50
CRR	3.660	34.03	16.865	9.199	54.55	50
NPLR	0.120	4.940	1.456	1.043	71.62	50

Source: *Research calculation*

The analysis of the correlation (Table 2) among the variables indicates several significant relationships impacting the financial performance of commercial banks. Return on assets (ROA) is positively associated with bank size, suggesting that larger banks tend to be more profitable. However, ROA shows a negative correlation with capital adequacy ratio (CAR), cash reserve ratio (CRR), and non-performing loan ratio (NPLR), implying that higher capital reserves, liquidity requirements, and credit risks can adversely affect profitability. Bank size is positively correlated with CAR but negatively with CRR and NPLR, indicating that larger banks are better capitalized but may face challenges in managing liquidity and loan quality. CAR has a weak positive correlation with CRR and a negative correlation with NPLR,

highlighting the complex dynamics between capital reserves and credit risk. These findings emphasize the intricate balance banks must maintain between growth, capital management, liquidity, and credit risk to optimize financial performance.

Table 2: Correlation analysis

Constructs	ROA	SIZE	CAR	CRR	NPLR
ROA	1				
SIZE	0.312	1			
CAR	-0.212	0.451	1		
CRR	-0.306	-0.363	0.044	1	
NPLR	-0.368	-0557	-0.268	0.191	1

** Significantly correlated at the 0.01 level (2-tailed)

* Significantly correlated at the 0.05 (2-tailed)

Source: *Secondary data*

In order to comprehensively understand the factors influencing the financial performance of commercial banks in Nepal, regression analysis was employed. The multiple R value of 0.571 indicates a moderate positive correlation between the independent variables and ROA. The R-square value of 0.326 suggests that approximately 32.6% of the variance in ROA can be explained by the independent variables included in the model. The adjusted R-square, which takes into account the number of predictors in the model, is 0.266, indicating that the model adjusts for the number of predictors and provides a more accurate estimate of the proportion of variance explained. The standard error of 0.496 reflects the average deviation of the observed values from the predicted values, providing a measure of the model's accuracy. Overall, the model summary suggests that the regression model provides a reasonable fit to the data, explaining a significant portion of the variance in ROA. The table indicates that the regression model is statistically significant, with an F-value of 5.447 and a corresponding p-value of 0.001, suggesting that at least one of the independent variables significantly contributes to the prediction of ROA. The regression sum of squares (SS) is 5.364, indicating the variability in ROA explained by the independent variables. The residual sum of squares is 11.078, representing the unexplained variability in ROA after accounting for the predictors. The total sum of squares is 16.443, reflecting the total variability in ROA. Overall, the ANOVA results support the conclusion that the regression model is statistically significant in explaining the variance in ROA, providing evidence for the predictive utility of the independent variables.

The intercept coefficient of 1.319 indicates the expected value of the dependent variable (ROA) when all independent variables are zero. However, it is not statistically significant at the 0.05 significance level

(p = 0.435), suggesting that it may not have a meaningful impact on ROA. Similarly, the coefficient for bank size (SIZE) is 0.589, indicating that for every one-unit increase in bank size, the ROA is expected to increase by 0.589 units. However, this relationship is not statistically significant at the 0.05 significance level (p = 0.098). Furthermore, the coefficient for Capital Adequacy Ratio (CAR) is -0.170, indicating that for every one-unit increase in CAR, the ROA is expected to decrease by 0.170 units. This relationship is statistically significant at the 0.05 significance level (p = 0.005), suggesting that higher levels of capital adequacy are associated with lower ROA. Finally, the coefficient for Cash Reserve Ratio (CRR) is -0.008, indicating that for every one-unit increase in CRR, the ROA is expected to decrease by 0.008 units. However, this relationship is not statistically significant at the 0.05 significance level (p = 0.360). The coefficient for Non-Performing Loan Ratio (NPLR) is -0.163, indicating that for every one-unit increase in NPLR, the ROA is expected to decrease by 0.163 units. This relationship is marginally statistically significant at the 0.05 significance level (p = 0.052), suggesting a potential negative impact of non-performing loans on ROA, although further investigation may be warranted.

Table 3: Regression analysis

Model summary

Multiple R	R Square	Adjusted R Square	Standard Error		Observation	
0.571171	0.326	0.266	0.496		50	
ANOVA						
Model		Sum of Square	df4	Mean of square	F	Sig.
1	Regression Residual	5.364 11.078	4 46	1.341 0.246	5.447	0.001
	Total	16.443	50			
a. Dependent Variable: ROA b. Predictors: (Constant), Bank Size, CRR, CAR, NPLR						
Coefficient						
Intercept	Coefficients	Standard Error	t Stat	P-value	Result (Significance)	
SIZE	1.319	1.675	0.787	0.435	NO	
CAR	0.589	0.349	1.689	0.098	NO	
CAR	-0.170	0.058	-2.943	0.005	YES	
CRR	-0.008	0.008	-0.924	0.360	NO	
NPLR	-0.163	0.082	-1.996	0.052	YES	

Dependent variable: ROA

Predictors: Intercept, SIZE, CAR, CRR, NPLR

Source: *Research calculation*

Discussions

The study examined various factors that influence the financial performance of commercial banks in Nepal, building upon existing research in banking and finance. Previous studies by Berger, Hasan and Zhou (2010), as well as Beck Demirgüç-Kunt and Levine (2006) have shown that larger banks tend to be more profitable and resilient due to economies of scale and scope, while Demirgüç-Kunt and Detragiache (1998) and Beck, Demirgüç-Kunt and Levine (2006) suggested that changes in the Cash Reserve Ratio (CRR) affect banks' liquidity and profitability. Similarly, studies by Boyd, De Nicolo and Loukoianova (2009) emphasized the importance of adequate Capital Adequacy Ratios (CAR) in maintaining financial stability.

Furthermore, research by Jimenez, Lopez and Saurina (2009) highlighted the detrimental effects of high levels of non-performing loans on bank profitability. In the context of Asian perspectives, studies by Hasan and Marton (2003) in India and Zhang and Qu (2007) in China echoed similar findings regarding the advantages of larger banks. In Nepal specifically, research by Sharma and Adhikary (2019) and Shakya and Parajuli (2020) emphasized the positive relationship between bank size and profitability, while Thapa, B., and Pokharel, S. (2018) highlighted the significance of the CRR in maintaining liquidity and profitability. Additionally, Bhattarai and Paudel (2020) underscored the importance of CAR in enhancing profitability; whereas Sharma, and Khanal (2017) emphasized the negative impact of high Non-Performing Loan Ratios (NPLR) on bank stability.

The study's hypotheses testing revealed that while the bank size and Cash Reserve Ratio did not significantly affect Return on Assets (ROA), higher Capital Adequacy Ratios were associated with lower ROA, and higher Non-Performing Loan Ratios had a marginally significant negative impact, indicating potential risks to profitability.

Conclusion

This study aimed to investigate the influence of bank-specific variables on the financial performance of commercial banks in Nepal, focusing on bank size, cash reserve ratio (CRR), capital adequacy ratio (CAR), and non-performing loan ratio (NPLR) in relation to Return on Assets (ROA). The primary objective was to provide insights into the factors driving financial performance within Nepal's commercial banking sector, contributing to a deeper understanding of the dynamics shaping the industry's landscape. Employing a quantitative research approach, this study utilized a cross-sectional research design to collect data from a purposive sample of commercial banks operating in Nepal.

Data on bank-specific variables and financial performance indicators were gathered from secondary sources such as annual reports, financial statements, and regulatory publications. Statistical techniques, including

regression analysis, were employed to analyze the relationships between bank-specific variables and ROA, testing the hypotheses proposed in the study. The hypotheses posited positive impacts of bank size, CRR, and CAR on ROA, alongside a negative impact of NPLR. The empirical findings of the study reveal several key insights into the relationship between bank-specific variables and Return on Assets (ROA) in commercial banks in Nepal. Firstly, the intercept coefficient of 1.319 suggests the expected value of ROA when all independent variables are zero, yet it is not statistically significant at the 0.05 significance level ($p = 0.435$), indicating its limited impact on ROA.

Similarly, the coefficient for bank size (SIZE) indicates a positive relationship with ROA, with every one-unit increase in bank size expected to lead to a 0.589-unit increase in ROA, but this relationship is not statistically significant ($p = 0.098$). Conversely, the coefficient for Capital Adequacy Ratio (CAR) suggests a negative association, with every one-unit increase in CAR leading to a decrease of 0.170 units in ROA, and this relationship is statistically significant ($p = 0.005$), indicating that higher capital adequacy is linked to lower ROA. Regarding the Cash Reserve Ratio (CRR), the coefficient indicates a negative impact on ROA, but it is not statistically significant ($p = 0.360$). Finally, the coefficient for Non-Performing Loan Ratio (NPLR) suggests a negative relationship with ROA, with a one-unit increase in NPLR expected to decrease ROA by 0.163 units, and while marginally statistically significant ($p = 0.052$), further investigation may be needed to fully understand the potential negative impact of non-performing loans on ROA.

This study's implications extend to both theoretical understanding and practical applications within Nepal's commercial banking sector. The empirical findings provide insights into the nuanced relationships between bank-specific variables and Return on Assets (ROA), offering valuable information for strategic decision-making by banking institutions and regulatory authorities. While the study reveals a non-significant impact of the intercept and bank size on ROA, it highlights the significant negative association between Capital Adequacy Ratio (CAR) and ROA, indicating the need for careful balance between capital adequacy and profitability. Additionally, the marginally significant negative relationship between Non-Performing Loan Ratio (NPLR) and ROA underscores the importance of effective risk management practices to mitigate the adverse effects of non-performing loans on financial performance. Furthermore, the non-significant impact of Cash Reserve Ratio (CRR) suggests a potential area for further exploration to elucidate its role in influencing ROA. Overall, these findings contribute to a deeper understanding of the dynamics shaping financial performance in Nepal's commercial banking sector, guiding stakeholders in optimizing strategies for sustainable growth and flexibility in a rapidly evolving industry.

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