Article

Modeling Financial Stability of Nepalese Commercial Banks: A CAMEL-Based Panel Data Analysis

Dipen Satyal [1], Bijay Lal Pradhan [1,*], Aayushma Pyakurel [1] and Nabaraj Poudyal [1]

[1] Amrit Campus ; Tribhuvan University, Nepal
* Correspondence: bijaya.pradhan@ac.tu.edu.np

Abstract: The stability of commercial banks is fundamental to ensuring macroeconomic resilience, sustainable economic growth, and public confidence in financial institutions. In Nepal, where financial intermediation is heavily dependent on banking, limited studies have modeled financial stability using comprehensive econometric approaches. This study applies the CAMEL framework—capital adequacy, asset quality, management efficiency, earnings, and liquidity—to examine the determinants of financial stability in Nepalese commercial banks. Using a balanced panel dataset of 15 Class "A" banks over ten fiscal years (2071–2081), financial stability is proxied by return on assets (ROA) and analyzed through pooled OLS, fixed effects, and random effects estimations. Diagnostic tests, including F-tests, Breusch-Pagan, and Hausman procedures, indicate the random effects model as the most appropriate specification. The findings show that return on equity, operating expenses to assets, and deposits-to-assets positively and significantly affect ROA, whereas loan-to-equity ratio and non-performing loan ratio exert negative and significant effects. Robustness checks confirm the absence of multicollinearity and serial correlation, with heteroscedasticity addressed through robust standard errors. These results highlight the importance of leverage management, credit risk control, and liquidity optimization in sustaining bank profitability and stability, offering valuable insights for both regulators and bank managers in Nepal.

Keywords: Financial Stability; CAMEL Framework; Panel Data; Commercial Banks; Nepal

Received:
Revised:
Accepted:
Published:

Citation: Satyal, D., Pradhan, B.L., Pyakurel, A. & Poudyal, N. (2025). Modeling Financial Stability of Nepalese Commercial Banks: A CAMEL-Based Panel Data Analysis. *International Journal of Financial Studies*, *1*(1), 0. https://doi.org/

1. Introduction

The stability of the commercial banks is not only critical in the financial system of a country, but also as an indicator of macro-economic robustness and management capability. Financial inter-mediation in Nepal has been dependent on the banking sector, key to which is ensuring the soundness and stability of the banks, which is the fundamental enabler in accomplishing sustainable economic growth, efficient resource allocation, and guaranteeing confidence level of the people in the financial institutions. The heart of the Nepalese banking network is the Class A commercial banks, among which Nepal Rastra Bank (NRB) is the central regulatory body that has been transformed enormously in scale, regulation & financial exposure in the last few years (Shah & Tiwari, 2023).

Capital Adequacy, Asset Quality, Management Efficiency, Earnings, and Liquidity are some of the components of CAMEL that has been adopted by most regulators and researchers around the world in evaluating financial strengths and stability of their banking institutions. Initially designed as a supervisory system in the United States, CAMEL framework has grown into a diagnostic and prognostic system that also works well in developed and developing economies (Sah & Sahani, 2024). The structured method enables the capital adequacy and asset quality to measure the risk exposures, management efficiency and earnings to measure the internal controls and profitability, and liquidity to measure resilience in short run. In comparison with individual measures of a bank sustainability, including rates of profitability or credit risk, CAMEL is a multidimensional indicator (Risal & Panta, 2019).

Some instances of empirical research work have also been undertaken through the use of elements of CAMEL in the Nepalese setting to test the performance of banks. In illustration, Shah & Tiwari (2023) performed a comparative CAMEL based assessment of low income commercial banks and revealed that capital adequacy is moderate and sound throughout the bank sector, although asset quality and liquidity levels are low and usually veiled by high profits. On the same note, Sah & Pokharel (2023) discussed the relationship between asset quality, earnings, and profitability, highlighting that the more banks have cleaner loan ports, the more stability they would show up in the long run. These studies however are mainly aimed at accomplishing performance measurement and they do not model long term financial stability in quantitative terms and time variation in financial stability attributes such as CAMEL. Credit risk which is an imperativeness of the asset quality is a concern to a degree in Nepal whereas rising non-performing loans (NPLs) in banking operations pose warning to the soundness of banks. The adverse effect on profitability and overall bank health due to high credit risk was highlighted by Bhattarai (2016), and systemic vulnerabilities over the adequacy of observing and provisioning approaches and disparities in the measurement of credit risk across the institutions were pointed out by Kattel (2016) . Pandey & Joshi (2023) further showed the positive linear relation between a good credit risk management strategy and enhanced profitability, therefore enhancing the stability of the institutions. Although there are other methods and findings of the past studies to learn, there are still considerable gaps. The available evidence is mostly found in literature that uses a descriptive design to study each part of CAMEL and the performance of the bank and not to model financial stability as a multifaceted concept. In addition, there is little that has used panel data techniques to allow cross sections and time changes over the banks at the same period. The effectiveness of econometric models like fixed effects, random effects and pooled Ordinary Least Squares (OLS) is hardly studied when applied in the Nepalese banking context. Additionally, little is understood on the variables of CAMEL that describe well about institutional stability in the long-term. This paper seeks to fill in these gaps by providing a ten year panel data regression model (according to Nepali calendar years 2071-2081) which models on the financial stability of Nepali commercial banks and that are based on all five CAMEL indicators. It evaluates the individual and collective impacts of the following variables and compares the output of the fixed effects, random effects along with pooled OLS models. In such a way, the study will supplement the CAMEL framework by introducing methodological rigor and an insight into real life insight that can be provided to the management of the banks and regulating authorities in Nepal to maintain sustainable financial stability in the country. In order to address these gaps in the literature, this study applied the following methodological procedure.

2. Data and Methods

This study employs a quantitative econometric design with panel data, combining both explanatory and descriptive approaches, following methodologies similar to those used by Baral (2005), Khati (2020), Poudel (2018), Shah & Tiwari (2023). The explanatory component analyzes the causal connection between the indicators of the CAMEL framework and stability as measured by the Return on Assets (ROA), while the descriptive component describes events in the field of financial stability of Nepalese commercial banks. Unobserved heterogeneity is considered in estimating the panel so that it is possible to utilize both cross-sectional and time-series variations.

All the 20 Class "A" commercial banks licensed by the Nepal Rastra Bank (NRB) make up the population. According to the full year data availability of fiscal years 2071–2081, a sample of 15 banks is selected, creating a balanced panel of 150 observations. Data were obtained entirely from secondary sources: audited annual reports of sampled banks, NRB's Banking Supervision Reports and statistical publications.

Financial stability is the dependent variable, represented by ROA. Independent variables capture the CAMEL dimensions: Capital Adequacy (C) as Loan to Equity Ratio (LER) (Abed, 2024), Asset Quality (A) as Non-Performing Loan Ratio (NPLR) (Bhandari & Dhakal, 2024), Management Quality (M) as Operating Expenses to Total Asset (OPEA) (Samad, 2015), Earnings (E) as Return on Equity (ROE) (Khati, 2020), and Liquidity (L) as Total Deposit-to-Asset Ratio (TDAR) (Yimer, 2024). All variables follow established banking literature. The following are the camel components and their measurements.

Table 1. CAMEL components and their measurement.

CAMEL component	Variable	Reference	Notation
Capital Adequacy	Loan to Equity Ratio	Abed (2024)	LER
Asset Quality	Non-Performing Loan Ratio	Bhandari & Dhakal (2024)	NPLR
Management Quality	Operating Expenses to Total Asset	Samad (2015)	OPEA
Earnings	Return on Equity	Khati (2020)	ROE
Liquidity	Total Deposit to Asset Ratio	Yimer (2024)	TDAR

Note: Variables are constructed following established banking literature.

The mathematical expressions of the variables are given as:

$$LER = \frac{\text{Total Loans and Advances}}{\text{Shareholders' Equity}},$$

$$OPEA = \frac{\text{Operating Expenses}}{\text{Total Assets}} \times 100,$$

$$ROE = \frac{\text{Net Profit}}{\text{Shareholders' Equity}} \times 100,$$

$$TDAR = \frac{\text{Total Deposits}}{\text{Total Assets}} \times 100,$$

$$NPLR = \frac{\text{Non-Performing Loans}}{\text{Total Loans and Advances}} \times 100.$$

The panel regression model is specified as:

$$ROA = \beta_0 + \beta_1 ROE + \beta_2 NPLR + \beta_3 OPEA + \beta_4 LER + \beta_5 TDAR + \epsilon.$$

Three estimation techniques are applied: pooled OLS, which assumes homogeneity across entities and time; fixed effects (FE), which controls for unobserved, time-invariant bank-specific effects; and random effects (RE), which assumes bank-specific effects are uncorrelated with regressors.

Robustness diagnostics are conducted, including checks for multicollinearity using Variance Inflation Factors (VIF), residual analysis through Q-Q plots and residual–fitted plots for normality, linearity, and homoscedasticity, and model selection tests such as the

F-test (Pooled vs. Fixed), Breusch–Pagan test (Pooled vs. Random), and Hausman test (Fixed vs. Random).

Data were organized in Microsoft Excel and analyzed using R, specifically the `plm` package (Millo & Croissant, 2008), for panel estimation and diagnostics. Descriptive statistics and correlation analysis complement regression results. Every data source used in the analysis is publicly available, with no confidential or proprietary information being disclosed. Full referencing of sources and transparency in the analytic process ensure reproducibility and integrity of the study.

3. Results

3.1. Comparison of Pooled OLS, Fixed Effects, and Random Effects Models

In order to examine the determinants of bank profitability, three panel regression specifications, namely the Pooled Ordinary Least Squares (OLS), Fixed Effects (FE), and Random Effects (RE) estimators has been applied. The dependent variable in all models is the return on assets (ROA), while the explanatory variables include return on equity (ROE), non-performing loan ratio (NPLR), operating expenses to asset ratio (OPEA), loan-to-equity ratio (LER), and total deposits-to-asset ratio (TDAR).

The Pooled OLS model treats the data as a simple cross-section, ignoring the panel structure, while the Fixed Effects estimator controls for unobserved heterogeneity across banks by allowing for bank-specific intercepts. The Random Effects model, in contrast, assumes that the unobserved heterogeneity is random and uncorrelated with the regressors.

To determine the most appropriate model for the dataset, a set of specification tests were conducted. The F-test was employed to compare the Pooled OLS and Fixed Effects models. The Breusch–Pagan Lagrangian Multiplier (LM) test was used to decide between Pooled OLS and Random Effects, while the Hausman test was applied to evaluate whether the Fixed or Random Effects specification is preferable. The outcomes of these tests suggest that although banks exhibit heterogeneity, the Random Effects estimator is consistent and efficient, and hence it is adopted for the subsequent analysis.

Table 2. Comparison of Pooled OLS, Fixed Effects, and Random Effects Models.

Independent Variables	Pooled OLS	Fixed Effects	Random Effects
ROE	0.0702*** (0.0032)	0.0716*** (0.0037)	0.0712*** (0.0033)
NPLR	-0.0583*** (0.0140)	-0.0622*** (0.0177)	-0.0601*** (0.0154)
OPEA	0.1229*** (0.0202)	0.1248*** (0.0239)	0.1243*** (0.0217)
LER	-0.1914*** (0.0104)	-0.1909*** (0.0116)	-0.1913*** (0.0106)
TDAR	0.0113*** (0.0027)	0.0115*** (0.0029)	0.0114*** (0.0027)
Constant	0.6400*** (0.2029)	—	0.6137*** (0.2055)
R^2	0.8315	0.8425	0.8384
Adj. R^2	0.8256	0.8195	0.8328
F-statistic	142.03***	139.11***	—
Chi-Square	—	—	747.00 (p < 0.001)

Note: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

3.2. Model Selection Tests

Table 3. Panel Model Specification Tests.

Test	Test Statistic	df	p-value	Interpretation
F-test (Pooled vs. Fixed)	$F = 2.51$	(14, 130)	0.003	Fixed Effects valid
Breusch–Pagan LM (Pooled vs. Random)	$\chi^2 = 9.54$	1	0.002	Random Effects valid
Hausman (Fixed vs. Random)	$\chi^2 = 1.56$	5	0.907	Random Effects valid

Note: All tests were conducted at 1% significance level.

3.3. Diagnostics Tests

3.3.1. Linearity

Residual plots confirm that residuals are evenly distributed on both sides of the zero line without systematic curvature. No strong evidence of heteroscedasticity or nonlinear effects is observed, suggesting that the linearity assumption of the RE model holds.

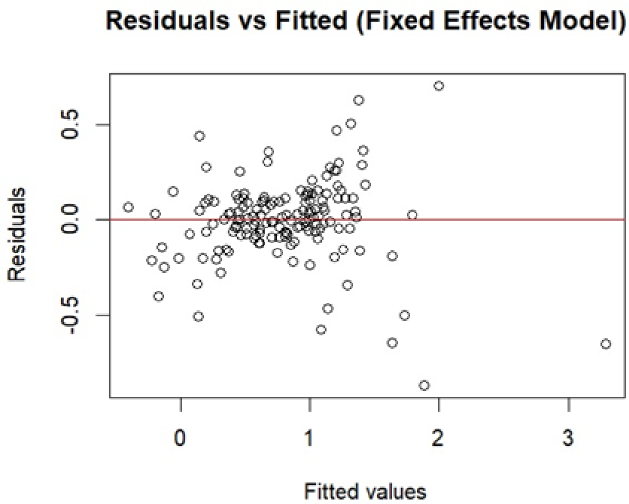

Figure 1. Residual plot for testing linearity of the Random Effects model.

3.3.2. Normality

The Q–Q plot indicates that the residuals are approximately normally distributed. Minor deviations exist at the tails but remain within acceptable bounds.

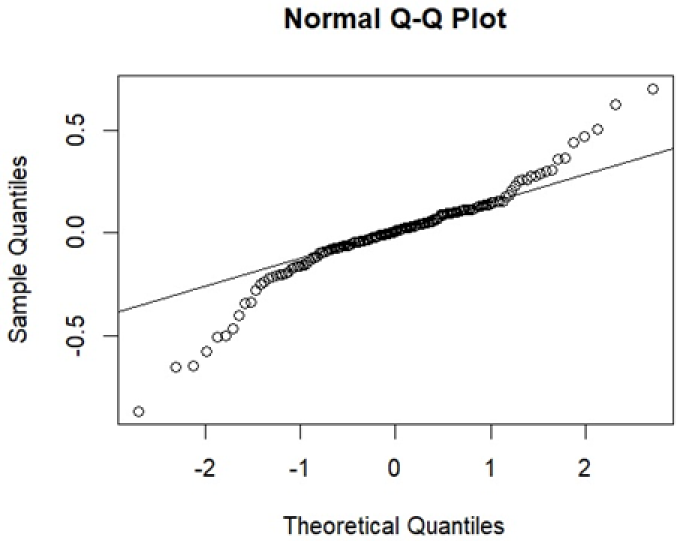

Figure 2. Q–Q plot of residuals indicating approximate normality.

3.3.3. Autocorrelation

Using the Breusch–Godfrey/Wooldridge test for serial correlation in panel models:

$$\chi^2 = 14.281, \quad df = 10, \quad p = 0.161$$

Since $p > 0.05$, we fail to reject the null hypothesis of no serial correlation. This indicates that model residuals are independent over time.

3.3.4. Homoscedasticity

The Studentized Breusch–Pagan test indicated a high degree of heteroscedasticity in the residuals (BP = 48.935, df = 5, $p < 0.001$). In contrast, the Wooldridge (2002) test did not provide evidence of serial correlation ($p = 0.161$). To address heteroscedasticity (and potential autocorrelation), robust standard errors were employed using the `vcovSCC()` estimator (Zeileis et al., 2020). This procedure adjusts the standard errors to account for heteroscedasticity and possible autocorrelation, ensuring that the statistical significance of the estimated coefficients remains valid even when the assumption of constant variance is violated.

Table 4. Random Effects Estimates with Robust Standard Errors.

Variable	Coefficient	Robust SE	t-value	p-value
Intercept	0.614	0.220	2.788	0.006**
ROE	0.071	0.008	8.650	< 0.001***
OPEA	0.124	0.056	2.211	0.029*
LER	-0.191	0.019	-10.113	< 0.001***
NPLR	-0.060	0.011	-5.334	< 0.001***
TDAR	0.011	0.004	2.587	0.011*

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The results of the estimation are summarized in Table 4. The effects of ROE ($\beta = 0.071$, $p < 0.001$) and OPEA ($\beta = 0.124$, $p < 0.05$) on ROA are noteworthy, as both profitability and operational efficiency are crucial determinants of performance. Conversely, LER ($\beta = -0.191$, $p < 0.001$) and NPLR ($\beta = -0.060$, $p < 0.001$) exhibit negative associations with ROA, indicating that higher liquidity constraints and non-performing assets reduce bank performance. In addition, a positive and significant effect of TDAR ($\beta = 0.011$, p < 0.05) is also observed. These results support theoretical expectations and confirm the robustness of the random effects estimates.

3.4. Multicollinearity

Table 5. Variance Inflation Factor (VIF).

Variable	VIF
ROE	3.45
OPEA	1.15
LER	3.64
NPLR	1.10
TDAR	1.15

The variability of the independent variables was examined to assess potential multicollinearity. The variance inflation factor (VIF) values for all variables were below the commonly accepted threshold of 5. ROE and LER recorded the highest VIF values at 3.45 and 3.64, respectively, while the remaining variables ranged between 1.10 and 1.15. These results indicate that multicollinearity is minimal, ensuring that the regression coefficients remain stable and statistically interpretable.

Table 6. Correlation Matrix.

	ROA	ROE	OPEA	LER	NPLR	TDAR
ROA	1	0.485	0.455	-0.001	-0.186	0.175
ROE	0.485	1	0.045	0.825	-0.264	0.252
OPEA	0.455	0.045	1	-0.133	0.083	0.142
LER	-0.001	0.825	-0.133	1	-0.256	0.297
NPLR	-0.186	-0.264	0.083	-0.256	1	0.027
TDAR	0.175	0.252	0.142	0.297	0.027	1

To assess potential multicollinearity among the independent variables, both the pairwise correlation matrix and the variance inflation factor (VIF) were considered. The correlations between most variables were of low to moderate magnitude, suggesting that they convey distinct information. A relatively high correlation was observed between ROE and LER ($r = 0.83$), indicating some degree of interdependence, though not at a level that poses serious concern.

This assessment was further supported by the VIF values, all of which remained below the generally accepted threshold of 5 (ROE = 3.45, LER = 3.64, OPEA = 1.15, NPLR = 1.10, TDAR = 1.15). These findings suggest that multicollinearity is limited and that the regression coefficients can be regarded as stable and meaningful.

4. Findings and Conclusion

The regression results indicate that return on equity (ROE) has a positive association with return on assets (ROA). This finding aligns with Gautam (2020), who documents a significant positive relationship between ROE and ROA in Nepalese financial institutions. Theoretically, higher ROE reflects efficient utilization of equity capital and stronger profitability, making a positive coefficient of ROE both plausible and expected. Our result therefore supports the Nepalese banking literature, indicating that increases in ROE are associated with increases in ROA.

In contrast, the operating expense-to-asset ratio (OPEA) enters the model with a positive coefficient. This implies that greater operating costs are associated with improved profitability, a finding that contradicts conventional banking theory. However, in transitional banking environments, strategic operating expenditures may generate positive returns, challenging the traditional cost–income paradigm. Although Nepal-specific studies on OPEA are limited, our results are consistent with the notion that targeted operating investments may enhance profitability.

The analysis further reveals a strong negative influence of the loan-to-equity ratio (LER) on ROA in Nepalese banks. This suggests that higher leverage reduces profitability, underscoring that excessive dependence on debt relative to equity may undermine asset effectiveness and overall bank value. Unlike prior studies in Nepal, which did not explore LER as a risk indicator of financial stability, our findings emphasize the importance of managing leverage carefully within the banking cycle.

Similarly, the non-performing loan ratio (NPLR) is found to exert a significant negative impact on ROA. This result is consistent with the widely accepted view that weak asset quality diminishes bank profitability. Khati (2020) reports that increases in non-performing loans (NPLs) are significantly associated with declines in ROA in Nepalese banks, and Gautam (2020) also observes a negative and significant association between asset quality and ROA. Our results therefore reaffirm that higher NPLR suppresses profitability in line with earlier evidence from Nepal.

Finally, the total deposit-to-asset ratio (TDAR) enters positively and significantly, suggesting that banks with stronger deposit bases report higher ROA. This outcome is consistent with Khati (2020), who finds a positive and significant relationship between TDAR and bank performance in Nepal. A larger and stable deposit base reduces funding costs and facilitates more efficient financing, thereby enhancing profitability. Our results corroborate this evidence, highlighting that effective liquidity management—particularly through maintaining a substantial pool of low-cost deposits—contributes significantly to improved profitability in Nepalese banks.

5. Conclusions

This paper examines the determinants of profitability in Nepalese banks, measured by return on assets (ROA). The results reveal that ROA and return on equity (ROE) are positively correlated, implying that higher ROE, achieved through judicious use of equity capital, contributes to greater profitability.

The operating expense-to-asset ratio (OPEA) also exhibits a positive effect, suggesting that strategic operating investments can enhance performance even in transitional banking settings, despite contradicting conventional cost–income expectations. In contrast, the loan-to-equity ratio (LER) shows a negative effect on ROA, indicating that excessive leverage reduces profitability and highlighting the need for prudent leverage management.

Similarly, non-performing loans negatively influence ROA, underscoring the detrimental effect of poor asset quality on bank performance. Conversely, the total deposit-to-asset ratio (TDAR) demonstrates a positive effect, reflecting the benefits of a stable deposit base and improved liquidity in enhancing profitability.

Overall, the findings emphasize that multiple interrelated factors—including efficient equity utilization, operational investment, leverage, asset quality, and liquidity—collectively shape profitability in Nepalese banks. Careful management of these dimensions is essential to sustain profitability and strengthen financial stability within the banking system.

Author Contributions: Conceptualization, Dipen Satyal; data curation, Dipen Satyal and Nabaraj Poudyal; methodology, Bijay Lal Pradhan; software, Bijay Lal Pradhan; validation, Bijay Lal Pradhan;

writing—original draft preparation, Dipen Satyal; writing—review and editing, Bijay Lal Pradhan and Nabaraj Poudyal; visualization, Aayushma Pyakurel; supervision, Bijay Lal Pradhan. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data supporting this study are publicly available. They were obtained from the audited annual reports of the sampled banks and from the Nepal Rastra Bank's Banking Supervision Reports and statistical publications.

Conflicts of Interest: The authors declare no conflicts of interest.

References

Abed, Z. N. (2024). The efficiency of financial ratios in predicting the financial success or failure of financial institutions—An analytical study of the Bank of Baghdad. *World Economics and Finance Bulletin, 40*, 49–57.

Baral, K. J. (2005). Health check-up of commercial banks in the framework of CAMEL: A case study of joint venture banks in Nepal. *Journal of Nepalese Business Studies, 2*(1), 41–55. https://doi.org/10.3126/jnbs.v2i1.55

Bhandari, M., & Dhakal, S. (2024). Assessing the impact of credit risk on the financial performance of commercial banks in Nepal. *Janaprakash Journal of Multidisciplinary Research, 2*(1), 1–16. https://doi.org/10.3126/jjmr.v2i1.75166

Bhattarai, Y. R. (2016). Effect of credit risk on the performance of Nepalese commercial banks. *NRB Economic Review, 28*(1), 41–64. https://doi.org/10.3126/nrber.v28i1.52552

Breusch, T.S.; Pagan, A.R. (1979). A simple test for heteroscedasticity and random coefficient variation. *Econometrica, 47*(5), 1287–1294. https://doi.org/10.2307/1911963

Gautam, K. R. (2020). Financial performance analysis of Nepalese financial institutions in the framework of CAMEL. *Janapriya Journal of Interdisciplinary Studies, 9*(1), 56–74. https://doi.org/10.3126/jjis.v9i1.35277

Kattel, I. K. (2016). Evaluating the credit risk measurement practices of commercial banks in Nepal. *IOSR Journal of Business and Management, 18*(3), 132–137. https://doi.org/10.9790/487X-1803021132137

Khati, P. (2020). Impact of liquidity on profitability of Nepalese commercial banks. *IOSR Journal of Economics and Finance, 11*(5), 26–33. https://doi.org/10.9790/5933-1105012633

Millo, G., & Croissant, Y. (2008). Panel data econometrics in R: The plm package. *Journal of Statistical Software, 27*(2), 1–43. https://doi.org/10.18637/jss.v027.i02

Pandey, C., & Joshi, B. K. (2023). Impact of credit risk management on profitability of Nepalese commercial banks. *Harvest, 2*(1), 17–32. https://doi.org/10.3126/harvest.v2i1.54406

Poudel, S. R. (2018). Assessment of credit risk in Nepali commercial banks. *Journal of Applied and Advanced Research, 3*(3), 65–72. https://doi.org/10.21839/jaar.2018.v3i3.137

Risal, H. G., & Panta, S. B. (2019). CAMELS-based supervision and risk management: What works and what does not. *FIIB Business Review, 8*(3), 194–204. https://doi.org/10.1177/2319714519873747

Sah, G. K., & Pokharel, S. P. (2023). Analysis of financial performance of Nepalese commercial banks using CAMEL approach. *Cognition, 5*(1), 37–49. https://doi.org/10.3126/cognition.v5i1.55405

Sah, R. K., & Sahani, S. K. (2024). Camel analysis in prediction of financial effectiveness of Nepalese development banks. *European Journal of Business Startups and Open Society, 2795*, 100.

Samad, A. (2015). Determinants of bank profitability: Empirical evidence from Bangladesh commercial banks. *International Journal of Financial Research, 6*(3), 173–179. https://doi.org/10.5430/ijfr.v6n3p173

Shah, B., & Tiwari, U. K. (2023). CAMEL analysis of commercial banks in Nepal: An assessment of financial soundness. *Journal of Contemporary Management Studies, 2*(4), Article 23090. https://doi.org/10.57159/gadl.jcmm.2.4.23090

Wooldridge, J.M. (2002). *Econometric Analysis of Cross Section and Panel Data*; MIT Press: Cambridge, MA, USA.

Yimer, I. A. (2024). The effect of liquidity management on the viability of microfinance institutions of Ethiopia. *International Journal of Management and Humanities, 11*(3), 24–30. https://doi.org/10.35940/ijmh.A1755.11031124

Zeileis, A., Köll, S., & Graham, N. (2020). Various versatile variances: An object-oriented implementation of clustered covariances in R. *Journal of Statistical Software, 95*(1), 1–36. https://doi.org/10.18637/jss.v095.i01

Zeileis, A.; Köll, S.; Graham, N. (2020). Robust standard errors for panel models with cross-sectional dependence. *Journal of Econometric Methods, 9*(1), 1–15. https://doi.org/10.1515/jem-2019-0005