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Impact of Financial Risk and Macro-Economic Variable on Stock Return: Evidence from Commercial Banks of Nepal

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Abstract

This paper examines the impact of financial risks and macroeconomic variables on the stock returns of commercial banks in Nepal. The study focuses on four main types of financial risks: credit risk, market risk, capital risk, and liquidity risk, alongside bank size, return on assets (ROA), and dummy variables for COVID-19 and earthquake impacts. Additional macroeconomic variables include economic growth, inflation, and interest rates. Using panel data regression on yearly data over 11 years for 20 commercial banks, the study investigates these factors' causal impacts on stock returns. The findings indicated that capital risk and liquidity risk negatively affect stock returns, suggesting that higher capital adequacy ratios limit high-risk, high-return investments, and higher liquidity risks lead to financial instability. Credit risk and market risk, however, did not impact stock returns. Larger banks faced negative stock returns, likely due to management complexities and inefficiencies. Economic growth and inflation positively impacted stock returns, reflecting economic optimism and increased activities, while higher interest rates negatively affected returns by increasing borrowing costs. The COVID-19 pandemic had a positive impact due to increased stock market activity amid limited investment opportunities, whereas the 2015 earthquake negatively affected returns as efforts focused on rebuilding. These insights underscore the need for robust risk management and consideration of broader economic conditions in investment and policy decisions.

Keywords: financial risk, credit risk, liquidity risk, market risk, stock return, panel data regression

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Introduction

Stock return refers to the fluctuation in a stock's market value over time, typically expressed as a percentage of the initial investment or an annualized return rate (Hull, 2015). Financial risk encompasses uncertainties that could lead to potential losses, such as a firm's inability to meet financial obligations due to insufficient cash flow (Jorion, 2007). In the banking sector, financial risks include credit risk, market risk, liquidity risk, and capital risk, each posing distinct challenges to financial stability (Haque & Wani, 2015). Additionally, financial risk is compounded by undiversifiable risks arising from macroeconomic factors such as interest rates, economic growth, inflation, and government regulations.

Credit risk specifically involves potential losses from borrowers failing to repay loans, a critical concern for banks (Jorion, 2007). Market risk refers to potential losses in financial markets due to fluctuations in asset prices like stocks, interest rates, currencies, and commodities (Hull, 2015). Liquidity risk arises when a bank cannot meet short-term obligations due to difficulties in quickly selling assets without significant loss (Tirole, 2010). Capital risk is associated with potential losses in investment capital and depends on the adequacy of reserves to absorb losses (Fabozzi, 2013).

Understanding the interplay between financial risk and stock return is essential for evaluating financial institutions' performance. Financial risks significantly influence stock returns, impacting both potential gains and losses. Effective risk management is crucial to managing this relationship, enabling institutions to achieve favorable stock returns while mitigating risks. Maintaining a balanced approach between risk and return through continuous assessment and management is vital for stability and positive performance in financial markets (Smith, 2022).

However, existing research has not conclusively established a strong causal link between financial risk and stock returns. Most studies have focused on specific company-specific diversifiable risks. Abu-Aljarayesh et al., (2021) examined liquidity risk, credit risk, and solvency risk, finding significant impacts on stock returns. Similarly, Mwaurah et al., (2017) explored credit risk, market risk, liquidity risk, and capital risk, highlighting positive impacts on stock returns. Naseem et al., (2015) concluded that interest rates and inflation rates have a negative significant relationship with stock returns. Purnamasari et al., (2012) demonstrated that capital risk is significantly related to stock returns, while liquidity risk and credit risk showed insignificant relationships. Cheng and Nasir (2010) studied interest rates, exchange rates, credit risk, solvency risk, market risk, and liquidity risk, finding that only liquidity risk significantly affects stock returns.

In the Nepalese context, Bhatt, Ahmed, Iqbal and Ullah (2023) and Chhetri (2021) assessed the impact of credit risk on bank performance, while Budhathoki et al., (2020) evaluated liquidity risk, capital risk, and credit risk on bank profitability.

A notable gap in the existing literature is the absence of studies that comprehensively consider both diversifiable risks (credit, liquidity, market, and capital risk) and undiversifiable macroeconomic indicators. This study extends spatially from previous research by examining the influence of overall financial risk, encompassing company-specific diversifiable risks (credit risk, liquidity risk, capital risk, and market risk), as well as macroeconomic variables such as economic growth, inflation, and interest rates, on stock returns of commercial banks in Nepal. Hence, the objective of the study is to examine the impact of company-specific diversifiable risks and macroeconomic variables on the stock returns of commercial banks in Nepal.

Hypotheses

The following hypotheses have been formulated to evaluate the impact of financial risk on stock return.

Primary Hypotheses:

1. Ha: Credit risk negatively influences stock returns.
2. Ha: Market risk negatively affects stock returns.
3. Ha: Capital risk has a negative impact on stock returns.
4. Ha: Liquidity risk has a negative impact on stock returns.

Control Hypotheses:

5. Ha: Country Inflation has a positive impact on stock return
6. Ha: Country Economic Growth has a positive impact on stock return
7. Ha: Interest rate on credit has a negative impact on stock return
8. Ha: Bank size has a positive impact on the relationship between financial risk and stock return.
9. Ha: Return on Asset has a positive impact on stock returns.
10. Ha: The COVID crisis has a positive impact on stock returns.
11. Ha: Earthquake crisis has a negative impact on stock returns.

Literature Review

Abu-Aljarayesh et al., (2021) examined the impact of different financial risks namely liquidity risk, credit risk, and solvency risk on the stock return of Jordanian banks. The study found that liquidity risk and solvency risk along with bank size as control have a significant negative impact on stock return. Using a two-step difference generalized method of moments (GMM), the research found significant connections between all types of financial risks (except credit risk) and stock returns when considering the size of the bank. These findings provided valuable insights for specialists to improve risk management and offered guidance for banking organizations to enhance their future returns.

Chetri (2021) examined the impact of credit risk on the financial performance of commercial banks in Nepal, focusing on variables such as return on assets (ROA), capital adequacy ratio, non-performing loan ratio (NPLR), management efficiency, liquidity, and bank size. Using a balanced panel data set of seventeen commercial banks with 85 observations from 2015 to 2020, regression analysis reveals a significant relationship between credit risk and profitability. The study finds that NPLR has a negative and statistically significant impact on the financial performance of these banks, highlighting the importance of effective credit risk and loan service process management to minimize non-performing loans. While capital adequacy ratio and bank size exhibit a negative impact without statistical significance, the credit-to-deposit ratio shows a positive but non-significant relationship with ROA. Additionally, the management quality ratio (MQR) is positively and significantly associated with financial performance, emphasizing the need for enhanced credit risk management strategies.

Mwaurah et al., (2017) studied the impact of financial risk on stock return in the stock market of Kenya using annual data from 2006 to 2015 for nine listed banks. The study investigated the effects of credit risk, market risk, liquidity risk, and capital risk, with bank size as a control and moderating variable on stock return. The finding revealed that individually, each type of financial risk positively influences stock returns, aligning with the risk-return tradeoff theory. However, collectively, financial risks negatively impact stock returns, while bank size positively influences them. Additionally, bank size moderates the relationship between financial risk and stock returns positively, suggesting that larger banks better manage financial risks, thus enhancing stock performance.

Mukanzi et al., (2016) examined the impact of financial risk on the stock return of non-financial firms and the result indicated that two of the variables, business risk and credit risk have a negative correlation and significant influence on stock return. Liquidity risk has a positive correlation and significant influence on the stock return of non-financial firms.

Akhavi Babi (2015) investigated the impact of financial risks on the relationship between earnings per share (EPS) and stock returns within companies listed on the Tehran Stock Exchange over a six-year period from 2008 to 2013. The multiple regression analysis found that credit and solvency risks negatively impact the relationship between EPS and stock return, whereas liquidity risk does not show a significant effect.

Conceptual Framework

Financial risk in the context of commercial banks encompasses several specific types of risks that can affect the bank's performance and stock return. These risks include:

Credit Risk: This is the risk that borrowers will default on their obligations, leading to financial losses for the bank. Credit risk is one of the most significant risks for commercial banks, as it directly impacts their loan portfolios. Effective management of credit risk

involves thorough credit assessments, setting appropriate credit limits, and continuous monitoring of borrower creditworthiness (Saunders & Cornett, 2011; Basel Committee on Banking Supervision, 2001).

Market Risk: Market risk involves the potential for losses due to changes in market prices, such as interest rates, foreign exchange rates, and equity prices. For commercial banks, market risk can arise from their trading activities, investment portfolios, and exposure to interest rate changes (Hull, 2015).

Liquidity Risk: Liquidity risk relates to the potential inability of a bank to meet its short-term financial obligations due to an inability to liquidate assets quickly without significant losses. Liquidity risk management is crucial for maintaining confidence among depositors and preventing bank runs. Banks manage this risk by maintaining adequate liquidity reserves, diversifying funding sources, and conducting regular stress tests to assess liquidity needs (Tirole, 2010; Cornett et al., 2011).

Capital Risk: Capital risk pertains to the risk that a bank may not have sufficient capital to absorb losses, which can threaten its solvency and ability to operate. Regulatory frameworks, such as the Basel III accord, require banks to maintain adequate capital buffers to mitigate this risk. Managing capital risk involves maintaining strong capital ratios, prudent asset management, and effective use of financial instruments to bolster capital reserves (Fabozzi, 2013; Van Greuning & Brajovic Bratanovic, 2009).

Apart from bank-specific financial risk, Macroeconomic variables such as economic growth, inflation, and interest rates significantly impact stock returns.

Economic Growth: Economic growth, often measured by change in Gross Domestic Product (GDP), has a positive relationship with stock returns. When the economy grows, corporate earnings typically increase, leading to higher stock prices. Investors anticipate future growth and profitability, which boosts stock market performance (Fama, 1990; Barro, 1990). Higher GDP growth signifies increased consumer spending, higher business investments, and improved corporate profitability. This positive outlook encourages investors to buy stocks, driving up prices.

Inflation: The relationship between inflation and stock returns can be complex. Moderate inflation often coincides with economic growth and can be beneficial for stocks. However, high inflation can erode purchasing power, increase costs for companies, and lead to higher interest rates, which negatively affect stock prices (Fisher, 1930; Bodie, 1976).

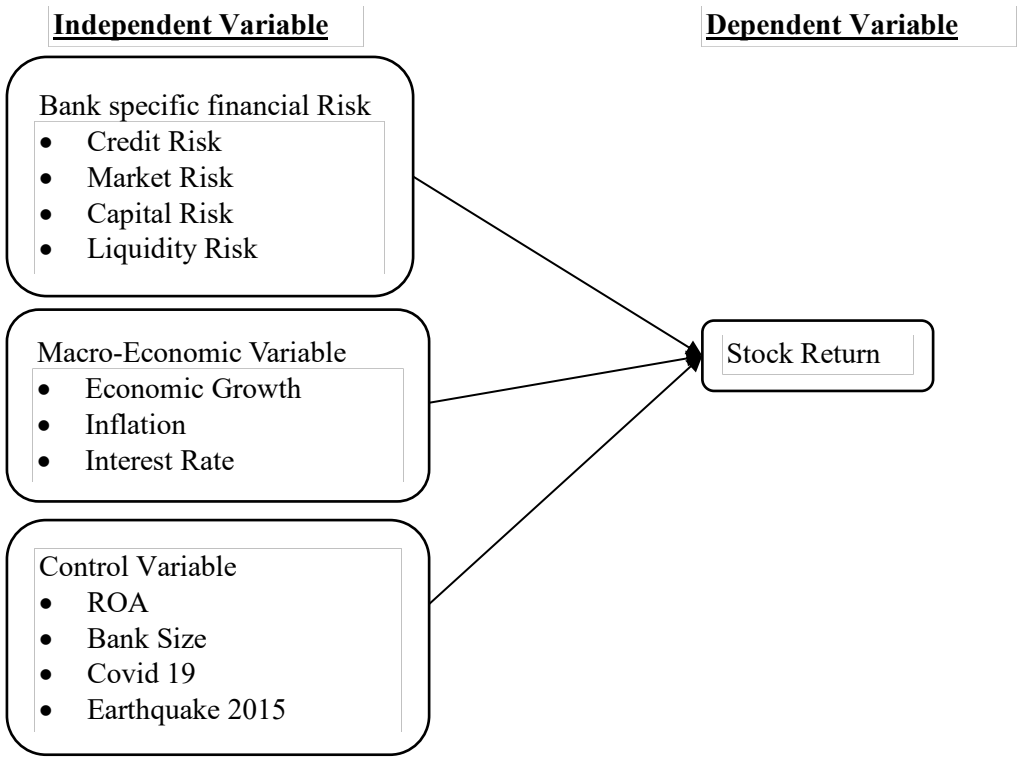
Interest Rates: Interest rates have an inverse relationship with stock returns. When interest rates rise, the cost of borrowing increases for businesses, which can reduce their profitability and lead to lower stock prices. Conversely, lower interest rates reduce borrowing costs and can stimulate investment and spending, leading to higher stock returns (Mishkin, 2001; Bernanke & Kuttner, 2005). Higher interest rates make bonds and other fixed-income

investments more attractive compared to stocks, leading investors to shift their funds from stocks to bonds. This shift reduces demand for stocks, causing prices to fall. In the current study, the weighted average interest rate on credit has been used interest variable.

Based on the past empirical research work reviewed, the variables are operationalized. The dependent variable is stock return and the independent variable is financial risks composed of liquidity risk, credit risk, market risk, and capital risk. Additionally, control variables have been included to account for potential confounding effects. The control variables used in the study includes bank size, covid crisis and earthquake crisis. Similarly, Macro Economic variables (economic growth, inflation and interest rate) have been used.

Figure 1

Impact of Financial risk and Macroeconomic Variable on Stock Return.



Research Design

The present research used a combination of descriptive and quantitative research design. Panel data regression has been used to establish the impact of financial risk on the stock return of commercial banks.

Population and Sampling Procedure

This study investigated the behavior of stock returns in relation to financial risks in the Nepalese stock market, using data from 20 publicly listed commercial banks over the period 2011/12 to 2023/24. Data were obtained from online sources and banks' annual and quarterly reports. The inclusion of all commercial banks, but Rastriya Banjiya Bank, ensures a representative sample, enhancing the generalizability and reducing biases.

Nature and Sources of Data Collection

This quantitative research analyzed the impact of financial risks on stock returns using time-series data from the Nepal Stock Exchange (NEPSE) index. Yearly closing prices, along with other stock return data, were collected from NEPSE and Merolagani financial web portal. Bank-specific data were sourced from Nepal Rastra Bank and annual reports of respective commercial banks excluding Rastriya Banijaya Bank. Similarly, macro-economic variables were collected from economic survey published by Ministry of Finance, Nepal.

Data Analysis

The current study used a panel data regression model given the nature of the data is the panel. The study used the below econometric model to examine the impact of financial risk and macroeconomic variables on stock return.

$$R_{i,t} = \beta_0 + \beta_1 NPL_{it} + \beta_2 \ln(CDR_{it}) + \beta_3 CAR_{it} + \beta_4 \ln(RWE_{it}) + \beta_5 \ln(TA_{it}) + \beta_6 Covid_t + \beta_7 Quake_t + \beta_8 Growth_t + \beta_9 Inf_t + \beta_{10} Int_t + \varepsilon_{it} \text{----------(i)}$$

Where,

$R_{i,t}$ = Stock returns of i banks for t periods=$[(P_t + \text{Cash Dividend}) - P_{t-1})/P_{t-1}]$

β_0 = Constant

β_n = Coefficients of respective variables

$\varepsilon_{i,t}$ = Error term

NPL_{it} = non-performing loan to Gross loan of i banks for t period (Credit risk)

$\ln(CDR_{it})$= Natural log of Credit to Deposit Ratio of i banks for t period (Liquidity Risk)

CAR_{it} = Capital Adequacy Ratio of i banks for t period (Capital Risk)

$\ln(RWE_{it})$= Natural log of Risk Weighted Exposure of i banks for t period (Market Risk or size of market risk exposure)

$\ln(TA_{it})$= Natural log of Total Assets of i banks for t period (Bank Size)

$Covid_t$ = Dummy variable, 1 = Covid affected period and 0 = Other than Covid period

$Quake_t$ = Dummy variable, 1 = Earthquake effect period and 0 = Other than earthquake affected period

$Growth_{t=}$ Economic growth of the economy in t period

Inf_f = Inflation level of the economy in t period

Int_t= Weighted average interest rate on credit in the economy in t period

The panel data regression (Fixed effect and Random effect) controls for the unobserved heterogeneity and time-invariant characteristics of the entities. OLS cannot control for unobserved variables that vary across entities but are constant over time (for example risk-handling approach of each bank is different but remains the same over period of time). This can lead to omitted variable bias if these unobserved factors are correlated with the independent variables. Fixed effect regression particularly controls for all time-invariant unobserved heterogeneity by allowing each entity to have its own intercept. Hence, Fixed effect regression controls for all time-invariant omitted variables, reducing bias.

Descriptive Statistics

Table 1 represents descriptive statistics of the study variable including dependent, independent, and control variables.

Table 1
Descriptive Statistics of Study Variables

Variables	Obs	Mean	Median	Std.Dev.	Min	Max
Stock Return	219	8.01	-5.63	52.26	-67.15	256.60
Total Asset	219	138,638.61	116,377.15	95,377.27	12,865.50	526,375.70
CAR	218	13.41	13.10	2.91	-0.49	29.14
Credit Risk	218	1.66	1.27	1.39	0.01	8.38
Liquidity Risk	218	76.34	75.84	5.97	59.45	90.69
Market Risk (in NPR)	219	163,219	97,136	322,222	0	3,517,366
ROA	219	1.47	1.46	0.50	0.02	2.75
Economic Growth	11	4.01	4.49	3.09	-2.42	8.59
Interest Rate	11	10.85	11.39	1.36	8.43	12.30
Inflation	11	6.88	7.44	2.63	2.70	11.80

Source: Output of Stata 13

Stock Return: The average stock return (8.01) is higher than the median (-5.63), indicating a right-skewed distribution. The high standard deviation (52.26) shows high variability in stock returns. The variability could be explained by other variables.

Total Asset: The mean (138,638.61) is higher than the median (116,377.15), indicating a right-skewed distribution with some firms having significantly larger total assets. Similarly, the high standard deviation (95,377.27) suggests substantial variation in total assets across firms. Hence natural log of Total assets has been taken for causal analysis.

CAR: The mean (13.41) and median (13.10) are close, indicating a fairly symmetric distribution. The standard deviation of 2.91 shows moderate variability. The observed CAR values can be attributed to the regulatory requirements set by the Nepal Rastra Bank (NRB) and the Basel III framework. The NRB mandates a minimum CAR of 11%, while the Basel III framework requires a higher threshold of 13%. This regulatory context likely influenced the CAR values, pushing most firms to maintain CAR levels around or above these thresholds.

Credit Risk: The Non-performing loan to Total Gross loan ratio represents the credit risk of the commercial banks. The mean (1.66) is higher than the median (1.27), indicating a right-skewed distribution. The standard deviation of 1.39 shows variability in credit risk among firms. The Credit risk varies from 0.01 to 8.38, indicating diverse risk levels among different commercial banks in the study period.

Liquidity Risk: The credit-to-deposit ratio represents the liquidity risk of the commercial banks. The mean (76.34) and median (75.84) are close, indicating a symmetric distribution. The standard deviation of 5.97 shows moderate variability. The observed liquidity risk values can be attributed to the regulatory requirements set by the NRB. The NRB has set a maximum credit-to-deposit ratio limit of 90%, which influenced the liquidity risk values for commercial banks. Banks are required to maintain their credit to deposit ratios below this threshold to ensure adequate liquidity and financial stability.

Market Risk: The Risk Weighted Exposure value represents the market risk for commercial banks as per Basel III disclosure. The mean (163,219) is significantly higher than the median (97,136), indicating a right-skewed distribution with some firms having very high market risk.

The high standard deviation (322,222) suggests substantial variability. Market risk varies widely from 0 to 3,517,366, reflecting diverse market exposure among firms.

ROA: The ROA is the measure of how the asset is being utilized to generate earnings. The mean (1.47) and median (1.46) are very close, indicating a symmetric distribution for ROA among commercial banks. The standard deviation of 0.50 shows low to moderate variability among the commercial. The result suggests that commercial banks operate with similar levels of efficiency in asset utilization. This also implies that the industry standards and best practices are being followed across the sector within the prudential norms set by NRB and bank regulation. The similar ROA values also indicate a competitive banking environment where banks strive to optimize their asset utilization to generate returns.

Economic Growth: Economic growth represents the real economic growth of the economy, measured as the annual percentage change in Gross Domestic Product (GDP) at constant prices. This variable provides a key macroeconomic indicator of the economy's progress. The average economic growth rate is 4.01, while the median is 4.49. The mean being lower

than the median indicates a slightly left-skewed distribution, suggesting that more years have above-average growth, but a few years with significant downturns have pulled the average down. The standard deviation of 3.09 shows considerable variability in economic growth over the study period, reflecting fluctuations in economic performance. Economic growth ranges from -2.42 to 8.59, indicating periods of both economic contraction and robust growth. The negative growth rates can be attributed to significant economic disruptions, such as the earthquake and the COVID-19 pandemic.

Interest Rate: Interest rate represents the weighted average interest rate on credit. This rate affects the lending activities of commercial banks and has implications on loans against stock.

The average interest rate is 10.85, and the median is 11.39. These close values indicate a relatively symmetric distribution of interest rates over the period studied. The standard deviation of 1.36 shows moderate variability in interest rates. Interest rates range from 8.43 to 12.30, reflecting changes in monetary policy over time. This range indicates the influence of policy adjustments on lending rates, impacting the cost of borrowing and lending activities.

Inflation: Inflation represents the increase in the price level of goods and services over time. In this study, it is measured as the change in the Consumer Price Index (CPI) at constant prices.

The average inflation rate is 6.88, while the median is 7.44. The mean being lower than the median indicates a slightly left-skewed distribution, suggesting that more years experienced higher inflation rates, but a few years with lower inflation rates pulled the average down. The standard deviation of 2.63 shows considerable variability in inflation rates over the study period. The inflation rates range from a minimum of 2.70 to a maximum of 11.80, indicating varying inflation rates over time. These fluctuations reflect changes in economic conditions, monetary policies, and external factors impacting price levels. For example, post-earthquake and COVID-19 pandemic, the inflation was at the lower end pulling down the average inflation rate in the study period.

Correlation Analysis

Table 2 represents a correlation matrix showing the strength of the linear relationship among the independent variables. The result shows that the correlation value is below 0.5 depicting a weak relationship among the variables. However, the variance Inflation Factor (VIF) test also needs to be carried out to ensure the absence of potential multicollinearity among the explanatory variable.

Table 2
Correlation Analysis among Independent and Control Variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) CAR	1.000								
(2) NPL_GL	-0.087	1.000							
(3) LRWE	0.018	-0.091	1.000						
(4) CDR	0.088	-0.122	0.385	1.000					
(5) ROA	0.067	-0.109	0.051	-0.242	1.000				
(6) EG	0.094	-0.111	-0.068	0.146	0.232	1.000			
(7) Int	0.075	0.034	0.082	0.128	0.037	0.415	1.000		
(8) Inf	-0.236	0.205	-0.365	0.063	-0.085	-0.374	0.022	1.000	
(9) LTA	0.030	-0.038	0.777	0.388	-0.026	-0.078	0.060	-0.428	1.000

Source: Output of Stata 13

Test of Multicollinearity

Multicollinearity is the condition where at least one of the independent variables is highly correlated with other independent variables which violates the assumption of multiple linear regression. A multicollinearity test is carried out to check the degree of correlation among independent variables. Variance inflation factor (VIF) is used to test the multicollinearity issue.

Table 3

Variance Inflation Factor (VIF)

	VIF	1/VIF
CAR	1.193	.838
NPL	1.161	.861
Ln(CDR)	2.104	.475
Ln(RWE)	2.905	.344
ROA	1.563	.64
Ln(TA)	3.431	.291
EG	3.432	.291
Int	2.37	.422
Inf	4.077	.245
Quake	1.485	.673
Covid	4.92	.203
Mean VIF	2.604	

Source: Output of Stata 13

Table 3 shows the VIF of explanatory variables. The result shows the VIF value is below 5 indicating there is no issue of multicollinearity among the variables and all the variables can be used in regression analysis.

Stationarity and Unit Root Test

The unit root test is conducted to ascertain whether a time series is non-stationary and contains a unit root, as stationarity is essential to prevent spurious regression results

where relationships might seem significant due to common trends rather than genuine connections. In this study, which involves unbalanced panel data, the Fisher-type unit root test has been applied to dependent, independent, and control variables to confirm their stationarity and ensure the absence of unit roots.

Table 4
Fisher-type Unit-Root Test for variables

Variable		Lag (n)	Statistic (Inverse chi-square)	p-value
Stock Return	R	0	218.9717	0.000 *
Capital Risk	CAR	0	81.3932	0.000*
Credit Risk	NPL	1	72.7212	0.001*
Liquidity Risk	Ln (CDR)	0	51.4503	0.100**
Market Risk	Ln (RWE)	0	122.2786	0.000*
ROA	ROA	0	92.9203	0.000*
Bank Size	Ln(TA)	0	68.21	0.003*
Economic Growth	EG	0	164.0793	0.000*
Interest Rate	Int	0	64.1319	0.009*
Inflation	Inf	0	139.3274	0.000*

Source: Output of Stata 13

The unit root test results using Fisher-type tests presented in table 4 indicate that all study variables, except for log liquidity risk, exhibit stationary behavior at the 1% level of significance. Specifically, stock return, capital risk, credit risk (after first-order differencing), market risk, return on assets (ROA), Bank size, economic growth, and inflation all show statistically significant results, rejecting the presence of a unit root. Log liquidity risk, however, shows significance at the 10% level, suggesting it is marginally non-stationary but becomes stationary when considering higher levels of significance. The first-order differencing applied to credit risk effectively transformed the data into a stationary form. These findings imply that the variables' mean, variance, and autocorrelation properties remain stable over time, supporting their use in subsequent reliable econometric modeling and robust financial analysis

Regression Results

The current study employs panel data regression, focusing on fixed and random effects models while excluding pooled regression. Pooled regression neglects individual-specific effects and unobserved heterogeneity among banks, potentially leading to omitted variable bias and correlation issues with time-invariant variables. This method may underestimate standard errors and produce biased coefficient estimates in the presence of autocorrelation.

In contrast, the fixed effect model controls for unobserved individual-specific time-invariant effect, auto correlation, and serial correlation by controlling entity-specific time trends. Fixed effect reduces bias from omitted variables that are constant over time within

entities (for example management practice in risk handling remains constant in each bank). Fixed effect allows estimation of coefficients that vary across entities(banks), accommodating heterogeneity in responses to changes in explanatory variables and also account for within-entity variation over time, enhancing statistical power and efficiency.

Similarly, the Random Effect model is more efficient than the Fixed effect when individual-specific effects are not correlated with explanatory variables (fixed effect assumes the correlation of individual-specific effect with explanatory variable). Randon effect accounts for both within-unit and between-unit variations and hence represents the average effect across all panel units.

Table 5

Panel Regression Outcome Fixed Vs Random and Hausman Test

	Fixed Effect				Random Effect			
Return	Coef.	St.Err.	t	P	Coef.	St.Err.	t	P
CAR	-3.072	1.33	-2.31	0.022**	-3.103	.973	-3.19	0.001*
Lag NPL	1.348	3.259	0.41	0.68	1.226	1.931	0.64	0.525
Ln (CDR)	-132.685	52.772	-2.51	0.013**	-142.225	42.291	-3.36	0.001*
Ln (RWE)	6.71	5.085	1.32	.0189	5.217	4.514	1.16	0.248
ROA	.807	7.876	0.10	0.918	-.857	6.105	-0.14	0.888
Ln (TA)	-34.275	9.681	-3.54	0.001*	-28.619	7.094	-4.03	0.0*
EG	8.274	1.604	5.16	0.0*	8.269	1.501	5.51	0.0*
Int	-4.85	3.716	-1.31	0.194	-5.949	3.451	-1.72	0.085***
Inf	19.387	2.767	7.01	0.00*	19.084	2.541	7.51	0.00*
Covid	93.266	18.421	5.06	0.00*	87.672	17.256	5.08	0.00*
Quake	-68.12	10.014	-6.80	0.00*	-68.266	9.483	-7.20	0.00*
Constant	824.302	191.451	4.31	0.00	834.652	168.943	4.94	0.00*
R-squared	0.614				0.608			
F-Value			23.62	0.00*	Chi-square		282.855	0.00*
Hausman specification test								
Chi-square			1.842	0.999				

Note: *** $p < 0.1$, ** $p < 0.05$, * $p < 0.01$

Source: Output of Stata 13

Table 5 shows the regression output under the fixed effect and random effect model. The r square value under both models shows around 61% variability in stock return is explained by explanatory variables. Both models show a significant overall fit (F-value for fixed effects and chi-square for random effects and p <1% level significance), indicating that the explanatory variables collectively have a significant impact on the dependent variable. The major significant variables include CAR, Ln (CDR), Ln (TA), EG, int, Inf, Covid, and Quake.

Hausman Specification Test:

The p value of 0.99 is greater than a 5% level of significance indicating the null hypothesis (random effects model is appropriate) cannot be rejected, suggesting that the

random effects model is preferred. Hence, the explanation of each variable under the random effect model has been explained.

CAR (Capital Risk):

The negative beta coefficient for CAR (Capital Adequacy Ratio) is significant at the 1% level, indicating a strong negative relationship between CAR and Return. This suggests that a higher CAR, which represents a greater amount of regulatory capital, may limit the bank's ability to engage in high-risk, high-return investments. As a result, this could potentially reduce the bank's profitability and, subsequently, its stock return.

Lag NPL (Credit Risk)

The credit risk coefficient is not statistically significant, indicating that past non-performing loans to gross loan ratio do not have a strong or significant effect on current returns. This suggests that the market may not heavily penalize banks for past credit issues.

Ln (CDR) (Liquidity Risk)

The beta coefficient for liquidity risk, as represented by the credit-to-deposit ratio (CDR), indicates a significant negative relationship with stock return. This suggests that banks with higher liquidity risk may struggle to meet short-term obligations, leading to financial instability and lower investor returns. Additionally, a higher credit-to-deposit ratio can signal that a bank is approaching its lending limits, which can constrain its ability to generate profits, further impacting stock returns negatively.

Ln (RWE) (Market Risk)

The beta coefficient is not significant for log of RWE which suggests that market risk (RWE) does not have a strong impact on returns. Investors might not see market risk exposure, as mandated by Basel III disclosure, as a critical factor influencing bank performance in this context.

ROA (Return on Assets)

The ROA beta coefficient is insignificant which indicates that ROA does not significantly affect returns. This might imply that returns are influenced more by other factors rather than the efficiency of asset use in generating profits.

Ln (TA) (Bank Size)

The bank size, as represented by the log of total assets, has a significant negative impact on stock return. This finding aligns with theoretical arguments suggesting that larger banks may face challenges related to management complexity and potential inefficiencies. Such difficulties can lead to a reduced perceived value from an investor's perspective. This negative impact may result from diminishing returns to scale or increased bureaucratic inefficiencies in larger institutions.

EG (Economic Growth)

The positive and significant coefficient for real economic growth (EG) at the 1% level of significance suggests that economic expansions positively influence stock returns in the banking sector. During periods of growth, banks benefit from increased profitability due to higher demand for loans and investments. Economic optimism also enhances investor confidence, leading to higher stock prices. Additionally, economic growth improves overall asset quality, reducing credit risk and bolstering financial stability in banks.

Int (Interest Rate)

The negative and weakly significant coefficient suggests that higher interest rates may negatively impact stock returns. When interest rates rise, borrowing costs increase, potentially reducing profitability for banks as they face higher costs in financing their operations and lending activities. Moreover, higher interest rates can dampen overall economic activity, leading to reduced demand for loans and investments, which can further constrain banks' profitability. As a result, these factors may contribute to lower stock market activity and reduced stock prices, thereby decreasing stock returns during periods of higher interest rates.

Inf (Inflation Rate)

The positive and significant coefficient for inflation rate (Inf) suggests that higher inflation is associated with higher stock returns in the banking sector. This relationship indicates that banks may benefit from the ability to charge higher interest rates during inflationary periods, thereby increasing their income. Additionally, moderate levels of inflation can stimulate economic activity, fostering positive investor and trader confidence, which tends to lift stock prices. Overall, these factors contribute to the positive impact of inflation on stock returns by enhancing banks' revenue potential and bolstering market sentiment during periods of inflation.

Covid

The positive and significant coefficient for the Covid variable (a dummy indicating the pandemic period) suggests that it is associated with higher stock returns. This could be attributed to several factors such as government interventions and increased financial activity during the pandemic. With many other economic activities restricted or halted, investors may have redirected funds into the stock market, leading to increased demand for stocks and higher stock prices. This surge in market activity amid limited investment opportunities elsewhere contributed to the observed positive impact on stock returns during the pandemic period.

Quake

The significant negative coefficient for the quake (earthquake in 2015) variable suggests that it is associated with lower stock returns. The earthquake in 2015 disrupted economic activity and had a negative impact on bank performance in Nepal. During such periods, resources were likely redirected towards rebuilding and addressing immediate needs, which could have reduced investment in the stock market. This shift can increase stock supply relative to demand, leading to lower stock prices and, consequently, lower stock returns. Thus, the observed negative impact on stock returns during earthquake periods reflects the broader economic and financial disruptions caused by natural disasters like the 2015 earthquake in Nepal.

Robust Standard Error Model

The robust standard error model has also been reported to address the possible issue of heteroskedasticity and model misspecification. Robus's standard error model provides reliable estimates of the standard errors, even when the distributional assumptions of normality and homoscedasticity are not met.

Table 6
Robust Regression Model

Return	Coef.	St.Err.	t-value	p-value
CAR	-3.103	.443	-7.00	.00*
Lag NPL	1.226	1.835	0.67	0.504
Ln (CDR)	-142.225	42.753	-3.33	0.001*
Ln (RWE)	5.217	3.632	1.44	0.151
ROA	-.857	5.902	-0.15	0.885
Ln (TA)	-28.619	7.637	-3.75	0.00*
EG	8.269	2.032	4.07	0.00*
Int	-5.949	2.598	-2.29	0.022**
Inf	19.084	2.413	7.91	0.00*
Covid	87.672	21.03	4.17	0.00*
Quake	-68.266	6.278	-10.87	0.00*
Constant	834.652	169.65	4.92	0.00*
Overall r-squared		0.608		
Chi-square		610.007		0.00*

Note: $^{***}p < 0.1$, $^{**}p < 0.05$, $^{*}p < 0.01$

Source: Output of Stata 13

The robust regression results presented in table 6 also provide consistent and statistically significant effects across all explanatory variables, indicating that financial risks such as capital and liquidity risks, alongside macroeconomic factors including economic growth, credit interest rates, and inflation, along with control variables like bank size and dummy variables for covid and earthquakes, collectively exert a substantial joint impact on the stock returns of commercial banks in Nepal. This thorough analysis highlights how

financial risk management, macroeconomic conditions, and external shocks are interconnected, offering valuable insights for stakeholders to assess and manage investment strategies and policy decisions in Nepal's banking sector.

Discussions

The current study reveals that capital risk and liquidity risk have a significant negative impact on stock returns, while credit risk is found to be insignificant. These findings align with Abu-Aljarayesh et al., (2021), but diverge from Chetri (2021), who found that credit risk significantly impacts bank profitability, as measured by ROA. Our study also incorporates macroeconomic factors and bank-specific control variables, distinguishing it from previous research. The negative impact of capital risk and liquidity risk is consistent with Mwaurah et al., (2017). However, unlike their findings, our study shows no significant effect of credit risk and market risk on stock returns. Additionally, bank size negatively impacts stock returns, contrary to Mwaurah et al., (2017). This study also contrasts with Mukanzi et al., (2016) and Akhavi Babi (2015), who found credit risk negatively influenced stock returns, and liquidity risk had varying impacts.

The significant negative impact of capital risk suggests that higher CAR limits a bank's ability to engage in high-risk, high-return investments, thereby reducing stock returns. Similarly, the negative impact of liquidity risk indicates that banks facing higher liquidity risks struggle to meet short-term obligations, leading to financial instability and lower investor returns. A higher credit-to-deposit ratio can signal a bank nearing its lending limits, constraining profit generation and negatively affecting stock returns. Larger banks face management complexities, potential inefficiencies, and diminishing returns to scale, leading to a negative impact on stock returns.

Macroeconomic variables such as economic growth and inflation positively impact stock returns, reflecting economic optimism and increased economic activities. In contrast, higher interest rates on credit increase borrowing costs, dampening economic activities and negatively affecting stock returns. The COVID-19 pandemic positively impacted stock returns due to a surge in stock market activity amid limited investment opportunities elsewhere, while the 2015 earthquake had a negative impact as economic activities shifted towards rebuilding efforts, reducing stock market investment.

Conclusion

The current study examined the impact of financial risks and macroeconomic factors on the stock returns of commercial banks in Nepal. The findings indicated that capital risk and liquidity risk significantly negatively affect stock returns, suggesting that higher capital adequacy ratios limit banks' ability to engage in high-risk, high-return investments, and higher liquidity risks lead to financial instability. However, the credit risk and market risk didn’t have a significant impact on stock returns.

The study also revealed that larger banks face negative stock returns, likely due to management complexities and inefficiencies. On the macroeconomic front, economic growth and inflation positively impacted stock returns, reflecting economic optimism and increased economic activities. In contrast, higher interest rates negatively affect stock returns by increasing borrowing costs. The COVID-19 pandemic positively influenced stock returns due to increased stock market activity amid limited alternative investment opportunities, while the 2015 earthquake had a negative impact as economic activities focused on rebuilding efforts.

The findings provide valuable insights for investors and policymakers to make informed decisions, highlighting the need for robust risk management practices and the consideration of broader economic conditions

References

Abu-Aljarayesh, N. I. O., Al-Tawalbeh, R. N. H., & Asfour, L. K. F. (2021). Financial risks impact on Jordanian commercial banks' stock returns. *International Journal of Economics, Commerce and Management, 9*(2). http://ijecm.co.uk/

Akhavi Babi, M. (2015). The effects of financial risks on the relationship between earnings and stock returns. *International Journal of Organizational Leadership, 4*, 154-169. https://doi.org/10.33844/ijol.2015.60379

Basel Committee on Banking Supervision. (2004). *International convergence of capital measurement and capital standards: A revised framework*. Bank for International Settlements.

Barro, R. J. (1990). The stock market and investment. *Review of Financial Studies, 3*(1), 115-131. https://doi.org/10.1093/rfs/3.1.115

Bernanke, B. S., & Kuttner, K. N. (2005). What explains the stock market's reaction to Federal Reserve policy? *The Journal of Finance, 60*(3), 1221-1257. https://doi.org/10.1111/j.1540-6261.2005.00760.x

Bhatt, T. K., Ahmed, N., Iqbal, M. B., & Ullah, M. (2023). Examining the determinants of credit risk management and their relationship with the performance of commercial banks in Nepal. *Journal of Risk and Financial Management*, *16*(4), 235. doi:10.3390/jrfm16040235

Budhathoki, P. B., Rai, C. K., Lamichhane, K. P., Bhattarai, G., & Rai, A. (2020). The impact of liquidity, leverage, and total size on banks' profitability: Evidence from Nepalese Commercial Banks. *Journal of Economics and Business*, *3*(2). doi:10.31014/aior.1992.03.02.219

Bodie, Z. (1976). Common stocks as a hedge against inflation. *Journal of Finance, 31*(2), 459-470. https://doi.org/10.1111/j.1540-6261.1976.tb01899.x

Cheng, F. F., & Md Nassir, A. (2010). Earning response coefficients and the financial risks of China commercial banks. *International Review of Business Research Papers, 6*(3), 178-188. ISSN 1832-9543.

Chhetri, G. R. (2021). Effect of credit risk management on financial performance of Nepalese commercial banks. *Journal of Balkumari College, 10*(1), 19. https://doi.org/10.3126/jbkc.v10i1.42088

Cornett, M. M., McNutt, J. J., Strahan, P. E., & Tehranian, H. (2011). Liquidity risk management and credit supply in the financial crisis. *Journal of Financial Economics, 101*(2), 297-312. https://doi.org/10.1016/j.jfineco.2011.03.001

Fabozzi, F. J. (2013). *Bond markets, analysis, and strategies*. Pearson Education.

Fisher, I. (1930). *The theory of interest*. Macmillan.

Fama, E. F. (1990). Stock returns, expected returns, and real activity. *Journal of Finance, 45*(4), 1089-1108. https://doi.org/10.1111/j.1540-6261.1990.tb02428.x

Haque, S., & Wani, N. (2015). Financial risk management in banks: A case study of foreign banks in Pakistan. *Journal of Risk and Financial Management*.

Hull, J. C. (2015). *Risk management and financial institutions*. Wiley.

Jorion, P. (2007). *Value at risk: The new benchmark for managing financial risk*. McGraw-Hill.

Merolagani. (2024). *Merolagani*. Retrieved from https://www.merolagani.com

Ministry of Finance, Nepal. (Year). *Economic Survey*. Retrieved from [https://www.mof.gov.np/site/publication-detail/3344]

Mishkin, F. S. (2001). *The economics of money, banking, and financial markets*. Addison Wesley.

Mukanzi, S., Mukanzi, M., & Maniagi, M. (2016). Influence of financial risk on stock return of non-financial firms listed on Nairobi Securities Exchange. *International Journal of Business and Management Invention, 5*(10), 66-77. http://www.ijbmi.org/volume5issue10.html

Mwaurah, I., Muturi, W., & Waititu, A. (2017). The influence of financial risk on stock returns. *International Journal of Scientific and Research Publications, 7*(5), 418. Retrieved from http://www.ijsrp.org

Naseem, S., Fu, G. L., Lan, V. T., Mohsin, M., & Zia-Ur-Rehman, M. (2019). Macroeconomic variables and the Pakistan stock market: Exploring long and short-run relationships. *Pacific Business Review International, 11*(7), 1-17.

Nepal Rastra Bank. (2024, July). *Monthly Statistics*. Retrieved from [https://www.nrb.org.np/category/monthly-statistics/?department=bfr]

Nepal Stock Exchange. (2024). *Nepal Stock Exchange*. Retrieved from https://www.nepalstock.com

Purnamasari, K., Herdjiono, I., & Setiawan, E. (2012). Financial risks, growth, earnings and stock returns relationship: The case of Indonesia. *International Review of Business Research Papers, 8*(7), 79-93.

Saunders, A., & Cornett, M. M. (2011). *Financial institutions management: A risk management approach*. McGraw-Hill Education.

Smith, J. (2022). *Risk management in financial institutions*. Financial Times Press.

Tirole, J. (2010). *The theory of corporate finance*. Princeton University Press.

Van Greuning, H., & Brajovic Bratanovic, S. (2009). *Analyzing banking risk: A framework for assessing corporate governance and risk management*. World Bank. https://doi.org/10.1596/978-0-8213-7728-4