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Risk and Return Analysis of Stocks of Nepalese Commercial Banks

Frijya Prasai[1], Ayushma Guragain[2], Sahishnu Shrestha[3], Sriju Singh[4]
[1,2,3,4,5] *BBA Scholar, Kathmandu College of Management, Nepal*

Abstract

This research article analyzes the impact of risk and return of Nepalese commercial bank stocks on portfolio returns to assist investors in making informed investment decisions. It aims to examine the effects of individual bank stock returns, risks, market return, and market risk (beta) on overall portfolio performance. The study utilizes a quantitative approach, employing descriptive statistics, comparative (trend) analysis, correlation analysis, and hypothesis testing. Secondary data was collected from 18 commercial banks in Nepal, including post-merger banks, covering the fiscal years from 2015/16 to 2021/22. Statistical tools such as SPSS and EViews were used for analysis. The findings indicate that investors seeking higher returns might consider Prabhu Bank, which offers high mean returns but also comes with higher volatility. In contrast, risk-averse investors may prefer banks like NMB and Nabil, which provide lower mean returns but more stable performance. Notably, this research contributes to the understanding of the risk-return relationship in the context of 18 Nepalese commercial banks post-merger, providing new insights for investors. This study highlights the importance of analyzing individual bank stocks and their associated risks for portfolio construction. By understanding the dynamics of risk and return, investors can optimize their investment strategies and enhance portfolio performance. Overall, this research fills a gap in existing literature by focusing on the Nepalese commercial banking sector and its implications for investor decision-making. The insights gained from this study can guide investors in navigating the complexities of the stock market, ultimately leading to more informed and strategic investment choices. Future research could expand on this work by exploring additional factors influencing stock performance and investor behavior in the Nepalese context.

Keywords: risk, return, commercial banks, post-merger, investors

Article Info.

Corresponding Author
Frijya Prasai

Email
frijya2025@kcm.edu.np

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Introduction

The Nepalese economy has seen significant growth recently, largely due to the expansion of its commercial banking sector (Regmi, 2022). Starting with the founding of Nepal Bank in 1937, the banking industry has evolved considerably (Shrestha, 2020). Today, both domestic and joint-venture commercial banks play a crucial role in economic development by mobilizing deposits and providing loans (Paudel et al., 2020). This sector offers attractive investment opportunities on the Nepal Stock Exchange (NEPSE) but also comes with inherent risks (Pokharel, 2019). Therefore, understanding risk and return analysis is essential for investors to make informed decisions, manage risks, and construct diversified portfolios (Chaudhary, 2021). This analysis is also useful for financial institutions and regulators to ensure the sector's stability and protect investors (Regmi, 2022). The risk and return analysis of Nepalese

commercial bank stocks illustrates the complex interplay of financial metrics (Mishra et al., 2021; Mishra & Kandel; 2023), investor behavior, and market conditions. By understanding these dynamics, investors can make more informed decisions, optimize their portfolios, and navigate the challenges of the Nepalese stock market effectively. Future research could expand on these findings by exploring the impact of macroeconomic factors and regulatory changes on the risk-return profiles of commercial banks in Nepal (Mishra & Aithal, 2021; Mishra & Aithal, 2022; Mishra & Aithal, 2023). The following sections will further explore the history, regulatory environment, and risk and return research in Nepal's banking sector.

Problem Statement

Investing involves utilizing the money now to potentially gain more in the future, by delaying spending and putting the funds into opportunities that offer growth and returns later on. It's a critical decision because if informed choices are not made, there's a significant risk of losing money (Regmi, 2022). In Nepal's rapidly growing banking sector, investors face the challenge of balancing high profits with risk management. The rise of numerous commercial banks, including local and joint-venture ones, complicates risk assessment (Bhattarai, 2016). Factors such as credit risk, interest rate fluctuations, and regulatory changes pose threats (Shrestha, 2020). While listing on the Nepal Stock Exchange offers profit potential, market volatility, and unclear policies increase risks (Thapa, 2023). Therefore, investors must align their strategies with their risk tolerance and financial goals (Pokharel, 2019). Effective collaboration between banks, regulators, and investors is crucial for clear understanding and risk management to maintain sector stability and investor confidence (Thapa, 2023). However, investors need to make better choices by selecting inferior bank stocks over those with solid fundamentals, potentially leading to losses (Kandel, 2018). Additionally, the introduction of digital banking and fintech innovations has introduced new risks and opportunities that investors need to consider (Thapa, 2023). The role of government policies and macroeconomic conditions also significantly impacts investment decisions in the banking sector (Adhikari, 2020). Finally, the global economic environment and foreign investment trends can influence the performance of Nepalese banks, adding another layer of complexity for investors (Gyawali, 2021).

Research Objective

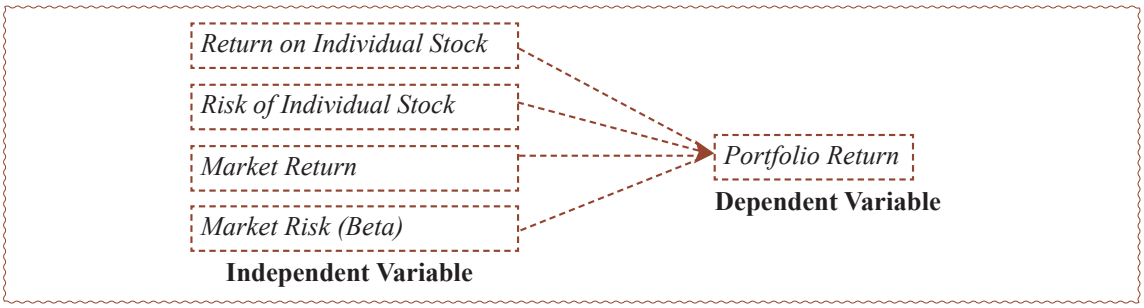
The objective of this study is to analyze the effect of the return on individual bank stocks, risks of individual bank stocks, market return, and market risk (beta) on the portfolio return.

Literature Review

Several studies have analyzed the risk and return dynamics of Nepalese commercial banks. Kandel (2018) found that commercial banks in Nepal, such as NABIL and NIBL, exhibit fluctuating returns and high risks, with a positive correlation between risk and return. The study recommended diversified portfolios to mitigate unsystematic risk. Paudel (2002) observed that shares of Nepalese commercial banks are heavily traded and tend to yield higher returns than the market portfolio, with many stocks being mispriced. Sijapati (2021) highlighted the importance of balanced investments across various securities to reduce return variability, noting that commercial banks preferred loans for higher returns but also invested in less risky government securities. Pokhrel (2019) identified SrBL as having the highest expected return but also the highest risk, while EBL's stock had the lowest risk per unit of return. Chaudhary (2021) emphasized that despite economic growth, investors struggle with limited information, making it difficult to manage risk through portfolio diversification. Adhikari (2018) used various financial tools to assess market risk, finding that MBL performed the best while EBL performed the worst, with some stocks being underpriced and others overpriced. Overall, these studies underscore the need for effective risk management and diversification strategies in the Nepalese banking sector.

Figure 1

Conceptual Framework



The study focuses on the effect of return on individual bank stocks, risks of individual bank stocks, market return, and market risk (beta) on the portfolio return. The independent variables are the return on individual bank stocks, risks of individual bank stocks, market return, and market risk (beta) and the dependent variable is the portfolio return.

Hypothesis

Based on the conceptual framework, the alternative hypotheses are:

H1: There is a significant relationship between required return of individual stocks and portfolio return

H2: There is significant relationship between the risk of individual assets and portfolio return

H3: There is significant relationship between market return and portfolio return

H4: There is a significant relationship between market risk (beta) and portfolio return

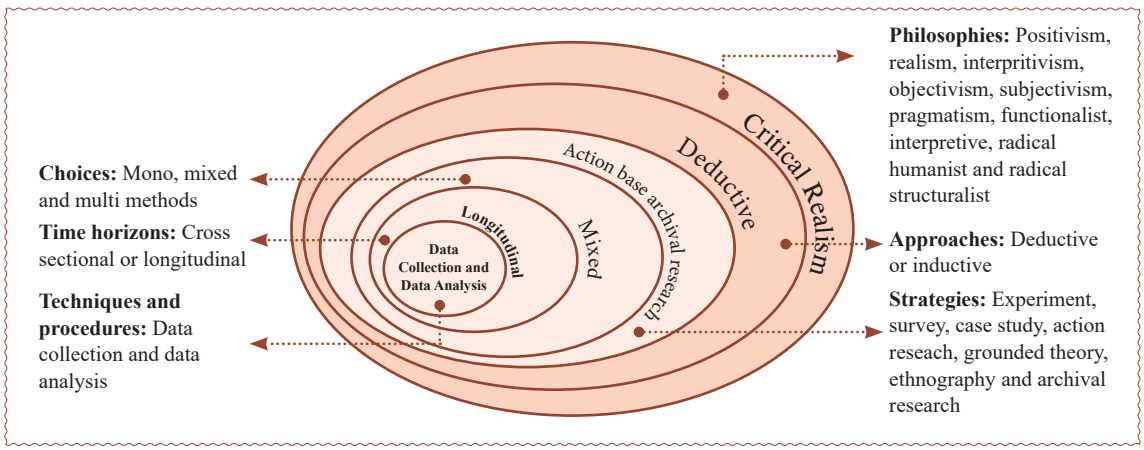
Methodology

Nature & Type of Research

The analysis of this research is conclusive quantitative and exploratory in nature as the aim is to critically analyze the performance of 18 Nepalese Commercial banks including the banks that have been through the merger process for a seven-year period from FY 2015/16 to FY 2021/22. This research is analytical as it aims to analyze the relationships between their individual risk, return, market risk and return on the portfolio return and is application-focused as it aims to generate applicable insights for the investors, banks and regulators to make the informed decisions.

Figure 2

Research Design



Although our research aligns with both positivism and realism philosophies, it leans more towards the philosophy of positivism under epistemology because our study aims to analyze the effects of various factors (returns, risks, market measures) on portfolio return by relying on observable empirical evidence such as measurable data and statistical relationships. Likewise, our research follows a deductive approach as we test the hypotheses we've formulated based on the Market Portfolio Theory (MPT) about the relationship between risk and return.

The strategy that we've employed on conducting our research is based on the action based archival research as our research not only focuses on analyzing the secondary data from financial reports, NEPSE records, and historical/ longitudinal time horizon for stock performance data (using mono-method i.e., quantitative approach) but also emphasizes the need for the findings to generate actionable insights for investors, banks, and regulators in the Nepalese banking sector. However, it's important to acknowledge that this approach wouldn't involve taking direct actions within the banking sector itself, but rather focus on providing recommendations based on our analysis.

Population & Sample

Our research takes into account a sample of 18 commercial banks post-merger that were listed on the Nepal Stock Exchange (NEPSE). By studying these 18 banks, we ensure a more accurate representation of analysis of the industry and avoid any bias from selecting only a few banks like existing research.

Table 1

Banks Understudy

S.N.	Bank Name
1	Nepal Investment Mega Bank Limited (NIMB)
2	Prabhu Bank Limited
3	Laxmi Sunrise Bank Limited (LS)
4	NMB Bank Limited
5	Nabil Bank Limited
6	Agriculture Development Bank Limited
7	Global IME Bank Limited
8	Prime Commercial Bank Limited
9	Himalayan Bank Limited (HBL)
10	Everest Bank Limited
11	Kumari Bank Limited
12	Machhapuchhre Bank Limited (MBL)
13	Siddhartha Bank Limited (SBL)
14	NIC Asia Bank Limited
15	Citizens Bank International Limited
16	Standard Chartered Bank Limited (SCBL)
17	Sanima Bank Limited
18	Rastriya Banijya Bank Limited (RBBL)

Data Collection Sources and Techniques

All the data necessary for the research is collected from secondary sources. The information has been collected by financial documents, annual and quarterly reports provided by commercial banks, NRB (Nepal Rastra Bank), trading manual published by Nepal Stock Exchange (NEPSE), NEPSE periodical articles, CDSE website and

Clearing House, related websites and previous research reports.

Tabulated Panel data (Bank-wise & Year-wise) of Portfolio Returns, IR, RRR, beta and Market Return was entered to the spreadsheet and calculations were also done manually.

Data Analytics Tool

Descriptive statistics analysis using mean, standard deviation, coefficient of variation, minimum and maximum has been conducted along with comparative (trend) analysis for tabulated data interpretation. For hypothesis testing, correlation regression analysis, and hausman test on statistical tools like Spss and Eviews has been done.

Variable Prepositions

Independent Variables

Variable 1: Return on Individual Stock. This refers to the profit or gain (or loss) on a single investment, typically expressed as a percentage (Regmi, 2022). In this context, it represents the return on the stock of a particular Nepalese commercial bank. Symbolically,

$$R = \frac{Dt + (Pt - pt\text{-}1)}{pt\text{-}1}$$

Where,

R = Actual rate of return on common stock at time t.

Dt = Cash dividend received at time t.

Pt = Price of a stock at time.

Pt-1 = Price of stock at time (t-1)

Similarly, the expected return is obtained by arithmetic mean of the past year's return. Symbolically,

$$E(r) = rn$$

Where,

E(r) = Expected rate of return during the time period j

N = Number of observations or returns.

Using Probabilities,

$$E(r) = P1*r_1 + P_2*r_2 + P_3*r_3 \ldots + P_n*r_n$$

Where;

E(r) = Expected return,

Pt = Probability of event t,

Rt = Rate of return at event t,

N = n^{th} event

Variable 2: Risk of Individual

This reflects the variability of the return on an individual investment. A higher beta indicates greater market risk (Thapa, 2023), meaning the stock price movement is more volatile than the market. Conversely, a beta less than 1 signifies lower risk (Hull, 2023).

Measures of Risk

Standard Deviation individual bank stocks: It is a statistical measure of the variability of a distribution of return around its mean. It is the square root of the variance and measures the unsystematic risk on stock investment. It is widely used to measure risk from holding a single asset. It is also a statistical measure of the variability of a set of observations. The standard deviation represents a large dispersion of return and is a high risk and vice versa. The symbol is called (σ) sigma. It measures the total risk on investment. Symbolically,

$$\text{Standard Deviation } (\sigma j) = \sqrt{\frac{\epsilon(rj - \underline{rj})^2}{n\text{-}1}}$$

Where,

σj = Standard deviation of return on stock j during the time period j

rj = Rate of return of stock j

$\underline{rj}$ = Average rate of return of stock j

N = Total number of years

Variance = Var (rj)= σ_j^2

Coefficient of Variance (CV) of stocks of individual banks: It is the ratio of standard deviation of returns to the mean of that distribution. It is a measure of relative risk and return. It measures the risk per unit of return. It is defined as the standard deviation divided by the mean of expected return. It is used to standardize the risk per unit of return i.e. measure the risk per rupee. The coefficient of variation should be used to compare investments when both the standard deviations and the expected values differ. The higher the coefficient of variation

$$\text{Coefficient of Variance (CV)} = \frac{\sigma j}{(E(r))}$$

Where,

CV = Coefficient of variance

σj = Standard deviation of return on stock j

E(r) = Expected rate of returns on stock j

Correlation Coefficient. Correlation coefficient is the relationship between two variables where one variable is independent and other variable is dependent. Correlation coefficient always lies in the range of +1 to-1. Karl Pearson's method is used to calculate correlation coefficient. A positive correlation coefficient indicates that the returns from two securities generally move in the same direction or vice-versa. Correlation is used to test the significant relationship between risk and expected return. The following formula can be used to calculate the correlation. Correlation coefficient between security 'i' and market 'j' is represented as:

$$\rho_{ij} = \frac{cov_{ij}}{\sigma_i \sigma_j}$$

Where,

σ_i and σ_j are the standard deviation of returns for assets i and j ρ_{ij} is correlation coefficient for asset i and j.

Variable 3: Market Return

This represents the overall performance of the market, often measured by an index like the Nepal Stock Exchange (NEPSE) index.

Variable 4: Market risk (Beta)

It refers to the possibility of an investment losing value due to broad fluctuations in the overall market that cannot be eliminated through diversification (Hull, 2022 as citedin Thapa, 2023). It is an index of the degree of movement of an asset's return in response to a change in the market return. Market sensitivity of stock is explained in terms of the beta coefficient. Higher the beta the sensitivity and reaction to the market movement is greater. Beta coefficient of a particular stock will be less, equal or more than 1, but the beta for market will always be 1. Symbolically,

$$\text{Beta Coefficient } (\beta_j) = \frac{(Cov\ (r_m, r_j))}{(\sigma_2\ m)}$$

Where,

σ^2 m = Variance of market return

Cov (rm,rj) = Covariance between the returns of security j and market

$$\text{Covariance (rm,rj)} = \frac{1}{2}\sum_{i-1}^{n}\sum(i=1)^{n}\ [rm-\underline{rm}][(rj-\underline{rj})]$$

Variable 1: Portfolio Return

This is the dependent variable influenced by the independent variables mentioned above. Modern Portfolio Theory (MPT) emphasizes the role of diversification (Markowitz, 1952 as cited in Paudel 2002) in reducing portfolio risk. By selecting stocks with low correlations, even if individual asset returns fluctuate, the overall portfolio return becomes more stable. Symbolically,

E(rp) = Wi*E(ri) +Wj*(rj) +…….+Wn* E(rn)

Where,

E(rp) = Expected rate of return of portfolio

Wi = proportion of wealth invested in i assets.

Wj = Proportion of wealth invested in j assets

E(ri) = Phe expected rate of return from the i assets

E(rj) = The expected rate of return from the j assets.

Analysis and Interpretation

Descriptive Statistics and Comparative analysis

In this section we have critically examined the portfolio returns, mean returns, standard deviation (SD), minimum (Min), maximum (Max), and coefficient of variation (CV) to provide insights into the performance and risk profiles of these banks of 18 Nepalese commercial banks over the period from 2015/16 to 2021/22. The study utilizes both bank-wise (horizontal) and year-wise (vertical) analysis to identify key trends and implications for investors and stakeholders.

Figure 2

Descriptive Statistics of Bank-wise Portfolio Return (PR) of 18 Nepalese Commercial Banks for the Period of 2015/16 to 2021/22

Bank	Mean	SD	Min	Max	CV
NIMB	-0.02	0.12	-0.26	0.11	-4.77
Prabhu	0.07	0.28	-0.41	0.47	4.28
Laxmi Sunrise	0.58	1.39	-0.32	3.70	2.39
NMB	0.09	0.17	-0.20	0.33	1.76
Nabil	0.00	0.19	-0.36	0.27	43.55
ADBL	0.12	0.34	-0.52	0.55	2.74
Global	-0.01	0.24	-0.37	0.40	-19.46
Prime	0.14	0.39	-0.42	0.56	2.82
HBL	-0.07	0.21	-0.46	0.14	-2.80
Everest	0.06	0.15	-0.20	0.26	2.35
Kumari	-0.01	0.20	-0.36	0.26	-23.81
MBL	0.07	0.17	-0.20	0.32	2.59
SBL	0.15	0.20	0.00	0.56	1.26
NIC Asia	0.16	0.25	-0.20	0.57	1.60
Citizen	0.16	0.29	-0.24	0.48	1.80
SCBL	-0.03	0.38	-0.55	0.52	-11.98
Sanima	-0.04	0.21	-0.40	0.27	-5.92
RBBL	0.03	0.36	-0.53	0.49	12.49

Table 2 shows that the portfolio return analysis of Nepalese commercial banks from 2015/16 to 2021/22 shows significant variability in performance and risk. Laxmi Sunrise Bank has a high-risk, high-reward profile, while Everest Bank offers a more balanced risk-return trade-off.

Figure 3

Descriptive Statistics of Year-wise Portfolio Return (PR) of 18 Nepalese Commercial Banks for the Period of 2015/16 to 2021/22

Year	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Mean	-0.20	0.10	0.12	0.04	0.04	0.20	0.27
SD	0.27	0.31	0.25	0.06	0.12	0.19	0.89
Min	-0.53	-0.55	-0.24	-0.05	-0.05	-0.16	-0.42
Max	0.45	0.56	0.52	0.17	0.48	0.57	3.70
CV	-1.36	3.29	2.10	1.37	2.83	0.95	3.26

Table 3 shows that 2021/22 had the highest volatility, suggesting that external factors greatly affected the banking sector. This indicates that investors have options ranging from high-risk, potentially high-return investments to more stable, lower-risk ones, highlighting the importance of careful risk assessment.

Figure 4

Descriptive Statistics of Bank-wise Individual Risk (IR) of 18 Nepalese Commercial Banks for the Period of 2015/16 to 2021/22

Bank	Mean	SD	Min	Max	CV
NIMB	2.93	0.65	2.41	4.32	0.22
Prabhu	2.89	0.44	2.17	3.54	0.15
Laxmi Sunrise	2.58	1.04	0.61	3.87	0.40
NMB	2.91	0.63	2.42	4.15	0.22
Nabil	2.93	0.53	1.97	3.52	0.18
ADBL	3.21	1.07	2.27	4.97	0.33
Global	3.92	3.92	1.48	12.63	1.00
Prime	3.34	0.79	2.35	4.82	0.24
HBL	2.92	0.61	2.11	3.72	0.21
Everest	3.42	1.29	1.68	5.49	0.38
Kumari	3.33	1.47	2.09	6.55	0.44
MBL	2.40	0.67	1.09	3.05	0.28
SBL	3.48	1.41	2.49	6.56	0.41
NIC Asia	3.12	0.98	2.23	5.22	0.31
Citizen	2.77	0.54	1.98	3.52	0.19
SCBL	3.55	1.87	2.08	7.05	0.53
Sanima	3.38	0.86	2.17	5.02	0.25
RBBL	3.59	0.64	2.90	4.48	0.18

Table 4 shows that the portfolio return analysis of Nepalese commercial banks from 2015/16 to 2021/22 shows significant variability in performance and risk. Laxmi Sunrise Bank has a high-risk, high-reward profile, while Everest Bank offers a more balanced risk-return trade-off.

Figure 5

Descriptive Statistics of Year-wise Individual Risk (IR) of 18 Nepalese Commercial Banks for the Period of 2015/16 to 2021/22

Year	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Mean	3.40	4.65	3.11	2.21	2.69	3.07	2.92
SD	0.85	2.45	0.90	0.67	0.50	0.60	0.33
Min	2.42	2.19	2.09	0.61	1.64	2.08	2.39
Max	5.22	12.63	5.24	3.48	3.39	4.48	3.45
CV	0.25	0.53	0.29	0.30	0.18	0.20	0.11

Table 5 shows that the years 2016/17 and 2015/16 had the highest average individual risks and volatility, suggesting favorable yet fluctuating market conditions, while 2018/19 and 2019/20 had the lowest average risks, indicating a more stable investment environment.

Figure 6

Descriptive Statistics of Bank-wise Required Return of Return (RRR) of 18 Nepalese Commercial Banks for the Period of 2015/16 to 2021/22

Bank	Mean	SD	Min	Max	CV
NIMB	-0.001	0.32	-0.56	0.44	-450.34
Prabhu	10.08	13.96	-6.09	33.77	1.39
Laxmi Sunrise	-0.10	0.10	-0.27	0.04	-1.01
NMB	-0.03	0.34	-0.44	0.50	-12.54
Nabil	0.06	0.39	-0.41	0.54	6.05
ADBL	-0.02	0.42	-0.48	0.66	-24.39
Global	-0.02	0.13	-0.29	0.09	-5.76
Prime	-0.02	0.45	-0.52	0.61	-22.59
HBL	-0.07	0.29	-0.46	0.38	-4.40
Everest	-0.13	0.44	-0.65	0.54	-3.30
Kumari	-0.03	0.41	-0.52	0.69	-15.80
MBL	-0.10	0.32	-0.47	0.46	-3.24
SBL	-0.05	0.39	-0.43	0.55	-7.57
NIC Asia	0.06	0.43	-0.51	0.58	6.64
Citizen	-0.09	0.45	-0.48	0.75	-5.19
SCBL	-0.23	0.41	-0.84	0.39	-1.78
Sanima	0.80	1.67	-0.57	3.45	2.08
RBBL	-0.11	0.44	-0.48	0.52	-4.20

Table 6 shows the individual return analysis of Nepalese commercial banks from 2015/16 to 2021/22 reflecting the potential fluctuations and uncertainty that investors may face. Prabhu had the highest mean required return (RRR) at 10.08, indicating higher expected returns to compensate for perceived risk, while SCBL (-0.23) and RBBL (-0.11) showed negative mean RRRs, suggesting lower investor expectations.

Figure 7

Descriptive Statistics of Year-wise Required Rate of Return (RRR) of 18 Nepalese Commercial Banks for the Period of 2015/16 to 2021/22

Year	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Mean	0.16	1.55	-0.73	0.77	1.19	0.66	0.31
SD	0.49	8.05	1.35	3.22	5.15	1.08	1.47
Min	-1.49	-0.65	-6.09	-0.27	-0.34	-0.11	-0.52
Max	0.66	33.77	-0.05	13.65	21.80	3.99	4.95
CV	3.00	5.21	-1.84	4.20	4.32	1.64	4.78

Table 7 shows that in 2016/17, investor expectations were highest with an average required return (RRR) of 1.55 and also experienced the highest volatility, while 2017/18 recorded the lowest average returns and instability with a minimum RRR of -6.09.

Figure 8

Descriptive Statistics of Bank-wise Market Beta of Stocks of 18 Nepalese Commercial Banks for the Period of 2015/16 to 2021/22

Bank	Mean	SD	Min	Max	CV
NIMB	3.5	5.6	-7.7	10.6	1.6
Prabhu	10.1	14.0	-6.1	33.8	1.4
Laxmi Sunrise	-2.0	7.1	-12.0	5.3	-3.5
NMB	10.5	20.3	-16.6	35.8	1.9
Nabil	3.5	17.1	-17.2	27.7	4.9
ADBL	10.5	18.9	-12.8	32.9	1.8
Global	-0.3	4.8	-8.8	5.0	-14.0
Prime	3.2	7.4	-5.6	15.8	2.3
HBL	7.7	11.2	-8.5	24.9	1.5
Everest	12.5	15.8	-7.7	41.1	1.3
Kumari	3.2	2.8	0.9	9.2	0.9
MBL	12.4	15.2	-11.9	36.9	1.2
SBL	7.6	19.3	-12.7	37.7	2.5
NIC Asia	10.3	9.9	-1.3	26.5	1.0
Citizen	6.4	8.2	-7.5	16.6	1.3
SCBL	6.9	16.3	-18.4	23.0	2.4
Sanima	-1.0	7.8	-11.8	8.6	-8.2
RBBL	4.2	13.0	-11.4	21.6	3.1

Table 8 shows that the market beta of stocks analysis of Nepalese commercial banks from 2015/16 to 2021/22 shows significant variability in performance and risk. Banks like Everest and MBL exhibited high mean beta values, indicating greater sensitivity to market movements, while Laxmi Sunrise and Sanima had lower, more stable betas. The high standard deviations in banks such as SBL and ADBL reflect substantial beta fluctuations, indicating instability.

Figure 9

Descriptive Statistics of Year-wise Market Beta of Stocks of 18 Nepalese Commercial Banks for the Period of 2015/16 to 2021/22

Year	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Mean	6.5	13.2	1.3	8.7	5.7	2.8	4.4
SD	9.9	11.5	15.6	9.3	17.7	10.9	11.4
Min	-16.6	-4.3	-18.4	-11.9	-14.5	-12.8	-12.7
Max	23.0	33.8	35.8	23.9	41.1	27.7	28.1
CV	1.5	0.9	12.5	1.1	3.1	3.9	2.6

Table 9 shows the year peak market risk in 2016/17 due to the slow recovery from the 2015 earthquake and trade disruptions/economic blockade with India. However,, there is a trend towards lower risk and more stable profiles in subsequent years

Figure 10

Descriptive Statistics of Bank-wise Market Return of 18 Nepalese Commercial Banks for the Period of 2015/16 to 2021/22

Bank	Mean	SD	Min	Max	CV
NIMB	0.08	0.36	-0.30	0.62	4.57
Prabhu	0.08	0.36	-0.30	0.62	4.57
Laxmi Sunrise	0.08	0.36	-0.30	0.62	4.57
NMB	0.08	0.36	-0.30	0.62	4.57
Nabil	0.08	0.36	-0.30	0.62	4.57
ADBL	0.08	0.36	-0.30	0.62	4.57
Global	0.08	0.36	-0.30	0.62	4.57
Prime	0.08	0.36	-0.30	0.62	4.57
HBL	0.08	0.36	-0.30	0.62	4.57
Everest	0.08	0.36	-0.30	0.62	4.57
Kumari	0.08	0.36	-0.30	0.62	4.57
MBL	0.08	0.36	-0.30	0.62	4.57
SBL	0.08	0.36	-0.30	0.62	4.57
NIC Asia	0.08	0.36	-0.30	0.62	4.57
Citizen	0.08	0.36	-0.30	0.62	4.57
SCBL	0.08	0.36	-0.30	0.62	4.57
Sanima	0.08	0.36	-0.30	0.62	4.57
RBBL	0.08	0.36	-0.30	0.62	4.57

Figure 11

Descriptive Statistics of Year-wise Market Return of 18 Nepalese Commercial Banks for the Period of 2015/16 to 2021/22

Year	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Mean	0.62	-0.10	-0.30	0.10	0.05	0.48	-0.30
SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Min	0.62	-0.10	-0.30	0.10	0.05	0.48	-0.30
Max	0.62	-0.10	-0.30	0.10	0.05	0.48	-0.30
CV	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 10 & 11 show that the market return analysis of Nepalese commercial banks from 2015/16 to 2021/22 shows significant variability in performance and risk. In 2015/16, the banks experienced a uniformly high positive return of 0.62, indicating strong sector performance. However, 2016/17 marked a significant downturn with all banks reporting a negative return of -0.10, due to the aftermath of the 2015 earthquake and trade disruptions/economic blockade with India. The negative trend intensified in 2017/18, with returns further declining to -0.30 due to the economic & monetary challenges at the time. A modest recovery occurred in 2018/19, as returns improved to 0.10 most likely due to the overall improving political and economic conditions at the time, followed by a slight dip to 0.05 in 2019/20, which suggests some emerging challenges at

the time. A substantial rebound in 2020/21 saw returns rise to 0.48, indicating favorable conditions or successful strategic responses. Nonetheless, 2021/22 brought another sector-wide downturn with returns falling back to -0.30 due the COVID-19 pandemic, economic pressures globally and political instability.

Regression Analysis and Hypothesis Testing

Hausman Test for Portfolio Return

To choose a fixed or random effect model a formal test called the Hausman test is used. It is based on the null hypothesis in favor of the random effect model estimator. If the p-value is greater than 0.05 (i.e., it is insignificant) random effects are preferable whereas if the p-value is less than 0.05(i.e., it is significant) fixed effects are preferable. The test evaluates the consistency of an estimator when compared to an alternative, less efficient estimator which is already known to be consistent. It helps one evaluate if a statistical model corresponds to the data.

The hypotheses for the Hausman test are:

H0: Random model is better than the fixed model.

H1: Fixed model is better than the random model.

Figure 12

Hausman Test for Portfolio Return (Correlated Random Effects - Hausman Test)

Test cross-section random effects			
Test Summary	**Chi-Sq. Statistic**	**Chi-Sq. d.f.**	**Prob.**
Cross-section random	7.08544	4	0.131

Since the p-value is greater than 5 percent, the null hypothesis is accepted and the alternative hypothesis is rejected for all the dependent variables. Hence in this study, the random-effect model is the most appropriate model for hypothesis testing.

Figure 13

Hausman Test for Portfolio Return (Correlated Random Effects - Hausman Test)

Model Summary	
R-squared	0.055329
Adjusted R-squared	0.024100
F-statistic	1.771724
Prob(F-statistic)	0.138902
Durbin-Watson Stat	1.417157

Dependent Variable: Portfolio Return
Sample: 2015/16-2021/22
Periods included: 7
Cross-sections included: 18
Total panel (balanced) observations: 126

Figure 14

Statical IR and Beta Calculation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.16	0.10	1.65	0.10
Beta	0.0	0.00	-0.32	0.75
IR	-0.02	0.03	-0.56	0.58
Market return	-0.31	0.12	-2.57	0.01
RRR	0.08	0.07	1.03	0.31

Based on the above table, the concluding framework can be drawn for the dependent variable as:

$$Y = 0.161-0.016*\beta_1+0.077*\beta_2-0.001*\beta_3-0.30*\beta_4$$

Where,

Y = Portfolio Return
β1 = IR
β2 = RRR
β3 = Beta
β4 = Market Return

On the basis of the table, the p-value of only Market return (0.0161) is less than 0.05 so Market return has a significant impact on Portfolio return. While individual risk (0.5764), required rate of return (0.3057) and beta (0.7485) has P-Value greater than 0.05 so it has no significant impact on Portfolio return.

Since among the variables examined, only Market return has a statistically significant effect on the dependent variable portfolio return while other variables IR, RRR, and Beta do not show statistically significant effects, hence why the framework can be deduced to:

$$Y = 0.161 - 0.30* \beta4$$

This shows that if market return increases by 1 unit, the portfolio return decreases by 0.30.

Besides this, according to the cross-section random effect, the value of R square is 5.53% i.e., 5.53% variation in the Portfolio return of commercial banks is explained by the independent variables included in the model. And the value of adjusted R square is 2.41% i.e., 2.41% variation in the portfolio return is explained by the independent variables after adjusting the degree of freedom. Similarly, in the above table F-statistics (1.771724) shows that the random effect model is right because the model is significant at 5 percent. Furthermore, the table also indicates that the overall model is significant at a 5% level of significance. The Durbin Watson statistics is 1.41 so there is positive autocorrelation present among the residuals.

Results and Discussion

While similar existing studies done by Regmi (2022) and Pokharel (2019) have explored the risk and return dynamics of the Nepalese Commercial Banks, our research presents the research based on the sample of 18 commercial banks in Nepal in the post merger scenario. Our findings are thus different from the previous studies that have been conducted. Likewise, the study conducted by Sijapati (2021) highlighted the importance of balanced investments across various securities to reduce return variability, noting that commercial banks preferred loans for higher returns but also invested in less risky government securities.

While SPSS is primarily a statistical tool for data analysis, our research focused on financial analysis, and incorporated the use of EViews. EViews was used to conduct the Hausman Test, which produced results consistent with those obtained through SPSS. Thus, we utilized both SPSS and EViews to ensure comprehensive and corroborative analysis.

Conclusion

This study aimed to analyze the risk and return of stocks of commercial banks in Nepal. The study used the Hausman Test for portfolio return. The result of this study found that a random model is better than a fixed model for hypothesis testing. The study also used a Regression model and the result showed that only Market return has a statistically significant effect on the dependent variable portfolio return while other variables IR, RRR, and Beta do not show statistically significant effects.

This research paper examines how the risk and return of stocks in Nepalese commercial banks affect portfolio performance to aid investors in making informed decisions. Our research takes into account a sample of 18 commercial banks post-merger that were listed on the Nepal Stock Exchange (NEPSE). By studying these 18 banks, we ensure a more accurate representation of analysis of the industry and avoid any bias from selecting only a few banks like existing research. Descriptive statistics analysis using mean, standard deviation, coefficient of variation, minimum and maximum has been conducted along with comparative (trend) analysis for tabulated data interpretation. For hypothesis testing, correlation regression analysis,

and hausman test on statistical tools like SPSS and Eviews has been done. The result of this study found that investors seeking higher returns might consider banks like Prabhu, which offer high mean returns but with higher volatility. Conversely, risk-averse investors might prefer stability found in banks like NMB and Nabil, offering lower mean returns but with more consistent performance.

In conclusion, this research suggests that only Market return has a statistically significant effect on the dependent variable portfolio return while other variables IR, RRR, and Beta do not show statistically significant effects.

Authors Note

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Appendix

Tabulated Panel Data (Bank-wise & Year-wise) of Portfolio Returns, IR, RRR, beta and Market Return of 18 Commercial Banks in Nepal

Bank	Year	Portfolio R	IR	RRR	Beta	Market R
NIMB	2015/16	-0.26	2.77	0.44	1.89	0.62
NIMB	2016/17	-0.02	3.00	-0.16	4.98	-0.10
NIMB	2017/18	-0.03	4.32	-0.56	-7.67	-0.30
NIMB	2018/19	-0.02	2.62	0.05	10.62	0.10
NIMB	2019/20	-0.02	2.53	-0.08	5.39	0.05
NIMB	2020/21	0.11	2.91	0.30	3.62	0.48
NIMB	2021/22	0.07	2.41	0.00	5.88	0.16
Prabhu	2015/16	-0.41	2.65	-0.12	-1.49	0.62
Prabhu	2016/17	0.32	3.54	0.21	33.77	-0.10
Prabhu	2017/18	0.47	2.88	-0.11	-6.09	-0.30
Prabhu	2018/19	0.07	2.17	0.15	13.65	0.10
Prabhu	2019/20	-0.02	2.76	-0.08	21.80	0.05
Prabhu	2020/21	0.12	3.29	0.10	3.99	0.48
Prabhu	2021/22	-0.09	2.95	-0.14	4.95	-0.30
LaxmiSunrise	2015/16	-0.32	2.62	0.04	3.54	0.62
LaxmiSunrise	2016/17	0.34	3.23	-0.27	1.45	-0.10
LaxmiSunrise	2017/18	0.13	2.11	-0.05	-11.95	-0.30
LaxmiSunrise	2018/19	0.16	0.61	-0.07	5.34	0.10

Bank	Year	Portfolio R	IR	RRR	Beta	Market R
LaxmiSunrise	2019/20	-0.01	2.48	-0.06	3.30	0.05
LaxmiSunrise	2020/21	0.06	3.87	-0.10	-6.28	0.48
LaxmiSunrise	2021/22	3.70	3.15	-0.21	-9.67	-0.30
NMB	2015/16	-0.20	2.42	0.50	-16.61	0.62
NMB	2016/17	0.33	4.15	-0.26	15.32	-0.10
NMB	2017/18	0.21	2.45	-0.37	35.80	-0.30
NMB	2018/19	0.04	2.75	0.11	20.30	0.10
NMB	2019/20	0.06	3.35	0.18	-14.50	0.05
NMB	2020/21	0.06	2.51	0.09	4.79	0.48
NMB	2021/22	0.16	2.76	-0.44	28.13	-0.30
NABIL	2015/16	0.06	3.36	0.24	5.60	0.62
NABIL	2016/17	0.05	3.22	-0.35	25.18	-0.10
NABIL	2017/18	0.00	3.52	-0.41	-17.21	-0.30
NABIL	2018/19	0.02	2.56	-0.07	-8.67	0.10
NABIL	2019/20	-0.01	1.97	-0.04	-5.57	0.05
NABIL	2020/21	0.27	3.01	0.54	27.66	0.48
NABIL	2021/22	-0.36	2.90	0.54	-2.46	-0.30
ADBL	2015/16	-0.52	4.37	0.66	0.00	0.62
ADBL	2016/17	0.55	4.97	-0.48	32.85	-0.10
ADBL	2017/18	0.35	2.61	-0.45	25.88	-0.30
ADBL	2018/19	0.08	2.27	-0.27	23.87	0.10
ADBL	2019/20	0.00	2.45	0.26	-12.75	0.05
ADBL	2020/21	0.17	2.46	-0.04	-12.75	0.48
ADBL	2021/22	0.23	3.34	0.20	16.43	-0.30
GLOBAL	2015/16	-0.07	2.73	0.07	1.22	0.62
GLOBAL	2016/17	-0.37	12.63	-0.08	-4.28	-0.10
GLOBAL	2017/18	0.11	2.10	-0.29	-0.79	-0.30
GLOBAL	2018/19	0.04	1.48	0.04	3.61	0.10
GLOBAL	2019/20	-0.05	1.64	-0.05	1.65	0.05
GLOBAL	2020/21	-0.16	3.53	0.09	-8.81	0.48
GLOBAL	2021/22	0.40	3.36	0.06	5.00	-0.30
Prime	2015/16	0.45	3.45	0.54	0.00	0.62
Prime	2016/17	0.53	4.82	-0.45	15.82	-0.10
Prime	2017/18	-0.23	3.08	-0.29	4.41	-0.30
Prime	2018/19	0.04	2.35	0.04	10.13	0.10
Prime	2019/20	0.03	3.07	-0.07	-0.74	0.05
Prime	2020/21	0.56	3.74	0.61	-5.61	0.48
Prime	2021/22	-0.42	2.87	-0.52	-1.35	-0.30
HBL	2015/16	-0.46	2.90	-0.17	2.94	0.62

Bank	Year	Portfolio R	IR	RRR	Beta	Market R
HBL	2016/17	-0.09	3.72	0.20	24.90	-0.10
HBL	2017/18	-0.24	3.52	-0.46	1.56	-0.30
HBL	2018/19	0.03	2.56	-0.22	17.59	0.10
HBL	2019/20	0.03	2.11	0.03	-8.48	0.05
HBL	2020/21	0.08	2.35	0.38	12.50	0.48
HBL	2021/22	0.14	3.27	-0.22	3.23	-0.30
Everest	2015/16	0.26	4.54	0.54	16.13	0.62
Everest	2016/17	-0.02	5.49	-0.65	6.94	-0.10
Everest	2017/18	-0.20	3.64	-0.60	-7.69	-0.30
Everest	2018/19	0.03	1.68	0.02	1.19	0.10
Everest	2019/20	0.07	3.36	0.07	41.06	0.05
Everest	2020/21	0.11	2.82	0.12	8.30	0.48
Everest	2021/22	0.20	2.39	-0.43	21.42	-0.30
Kumari	2015/16	-0.36	2.89	0.07	2.44	0.62
Kumari	2016/17	0.26	6.55	0.07	2.41	-0.10
Kumari	2017/18	0.04	2.09	-0.46	2.69	-0.30
Kumari	2018/19	-0.05	2.62	0.10	9.20	0.10
Kumari	2019/20	-0.03	2.77	-0.13	0.93	0.05
Kumari	2020/21	0.19	3.28	0.69	1.52	0.48
Kumari	2021/22	-0.11	3.09	-0.52	3.48	-0.30
MBL	2015/16	-0.07	3.05	0.46	14.89	0.62
MBL	2016/17	0.22	2.19	-0.47	17.94	-0.10
MBL	2017/18	0.12	2.25	-0.42	4.08	-0.30
MBL	2018/19	0.03	1.09	0.07	6.04	0.10
MBL	2019/20	0.05	3.04	0.04	36.92	0.05
MBL	2020/21	0.32	2.59	-0.11	-11.89	0.48
MBL	2021/22	-0.20	2.62	-0.27	19.03	-0.30
SBL	2015/16	0.07	3.47	0.30	20.69	0.62
SBL	2016/17	0.56	6.56	-0.42	10.57	-0.10
SBL	2017/18	0.24	2.49	-0.43	17.43	-0.30
SBL	2018/19	0.06	2.79	0.10	-11.93	0.10
SBL	2019/20	0.00	2.57	-0.06	37.69	0.05
SBL	2020/21	0.12	3.45	0.55	-8.24	0.48
SBL	2021/22	0.03	3.06	-0.40	-12.70	-0.30
NICAsia	2015/16	-0.20	5.22	0.38	10.11	0.62
NICAsia	2016/17	-0.05	3.33	-0.51	15.33	-0.10
NICAsia	2017/18	0.33	2.77	-0.28	26.48	-0.30
NICAsia	2018/19	0.17	2.23	0.37	16.47	0.10
NICAsia	2019/20	0.10	2.92	0.24	-1.25	0.05
NICAsia	2020/21	0.57	2.82	0.58	3.36	0.48
NICAsia	2021/22	0.17	2.57	-0.33	1.35	-0.30
Citizen	2015/16	-0.24	3.52	0.23	8.78	0.62

Bank	Year	Portfolio R	IR	RRR	Beta	Market R
Citizen	2016/17	-0.15	2.69	-0.48	9.72	-0.10
Citizen	2017/18	0.47	2.95	-0.41	-7.49	-0.30
Citizen	2018/19	0.01	1.98	-0.02	13.42	0.10
Citizen	2019/20	0.48	2.19	-0.21	16.59	0.05
Citizen	2020/21	0.28	3.18	0.75	2.57	0.48
Citizen	2021/22	0.28	2.87	-0.47	1.49	-0.30
SCBL	2015/16	-0.47	2.75	0.39	23.03	0.62
SCBL	2016/17	-0.55	7.05	-0.61	22.79	-0.10
SCBL	2017/18	0.52	5.24	-0.84	-18.36	-0.30
SCBL	2018/19	0.00	2.30	-0.08	4.77	0.10
SCBL	2019/20	0.02	2.97	-0.04	-1.36	0.05
SCBL	2020/21	0.01	2.08	-0.08	22.15	0.48
SCBL	2021/22	0.25	2.45	-0.34	-4.70	-0.30
Sanima	2015/16	-0.40	5.02	0.16	3.04	0.62
Sanima	2016/17	-0.20	3.11	-0.57	4.15	-0.10
Sanima	2017/18	0.01	3.58	-0.32	-8.15	-0.30
Sanima	2018/19	0.04	2.17	0.04	4.31	0.10
Sanima	2019/20	0.05	3.39	-0.12	-6.86	0.05
Sanima	2020/21	0.27	2.97	2.97	8.64	0.48
Sanima	2021/22	-0.02	3.45	3.45	-11.80	-0.30
RBBL	2015/16	-0.53	3.43	-0.40	21.63	0.62
RBBL	2016/17	0.01	3.38	-0.47	-3.11	-0.10
RBBL	2017/18	-0.19	4.45	-0.48	-10.41	-0.30
RBBL	2018/19	-0.02	3.48	-0.08	16.02	0.10
RBBL	2019/20	-0.02	2.90	-0.34	-11.36	0.05
RBBL	2020/21	0.46	4.48	0.52	4.99	0.48
RBBL	2021/22	0.49	2.98	0.51	11.67	-0.30