

# Risk and Return Analysis of Nepalese Commercial Bank's Stock

By

Rabi Regmi  
20264058

A thesis submitted to the Brac Business School in partial fulfillment of the requirements  
for the degree of  
Masters of Business Administration

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## **Declaration**

It is hereby declared that

1. The thesis submitted is my own original work while completing my degree at Brac University.
2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The thesis does not contain material that has been accepted or submitted, for any other degree or diploma at a university or other institution.
4. I have acknowledged all main sources of help.

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**Rabi Regmi**  
20264058

## Approval

The thesis/project titled “Risk and Return Analysis of Nepalese Commercial Bank’s Stock” submitted by

1. Rabi Regmi (20264058)

of Summer, 2022 has been accepted as satisfactory in partial fulfillment of the requirement for the degree of Masters of Business Administration on the date of Defense.

### Examining Committee:

Supervisor:  
(Member)

---

Dr. Suman Paul Chowdhary  
Associate Professor, Brac Business School  
Brac University

Program  
Coordinator:  
(Member)

---

Riyashad Ahmed  
Program Director, MBA and Assistant Professor  
Brac Business School  
Brac University

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2. This paper has not been considered for publication anywhere at this moment.
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## **Abstract/ Executive Summary**

This is the study conducted to analyze the stocks of Nepalese commercial banks on the basis of stock return and risk. The study mainly focused on two areas, firstly, it tries to find out and focuses on identifying the firm-specific variables and their influences on return and risk to the investors. It is studied to determine the relationship between different variables and their significance on return/risk. Secondly, based on the return is derived based on dividends earned and capital appreciation or depreciation realized at the closing date of each fiscal year from 2017 to 2021. It calculated expected return (mean return), standard deviation, variance, coefficient of variation, correlation of banking sector, market, and each individual selected bank for analysis. It also calculated and segregated diversifiable and undiversifiable risk in each stock, the beta of each stock and sector to find out whether aggressive or defensive stock and the CAPM model to find out over or underpriced stock.

The study found that EPS, P/E ratio, ROA, NPL, Market coverage with branches, and firm size have significant influences on risk/return. And ROE, Net worth, Capital, loan mobilization, firm age, and growth rate were found to be insignificant effects on risk/return. It has been found that only NIC Asia bank is performing better than the banking sector and has the lowest risk per unit of return. PRVU bank, Nepal bank, GBIME bank, and Kumari banks were found to be performing better in terms of risk and return. The whole banking sector was found to be a defensive sector with a sector beta of 0.69 and almost all banks except Kumari and PRVU banks were found defensive stock. Most of the banks were also found to be having a greater percentage of systematic risk, only NIBL, NMB, NICA, and PRVU have a higher percentage of unsystematic risk which can be diversified as the market just fell from the bullish trend cycle most stocks found to be overpriced and earning less than the required rate of return.

**Keywords:** Return/risk; influencing factors; significance; standard deviation; variance; betas.

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## List of Acronyms

NRB	Nepal Rastra Bank
NP	Nepal
MFI	Micro Finance Institutions.
NEPSE	Nepal Stock Exchange
NIFRA	Nepal Infrastructure Development Bank
FDs	Fixed Deposits
DEMAT	Dematerialization Account
MPS	Market Price per Share
ROE	Return on Equity
ROA	Return on Assets
EPS	Earning Per Share
MPS	Market Price Per Share
NPL	Non-Performing Loan

# Chapter 1

## 1.1 Introduction

The development of the country and economy depends on industrial development, commercial activities, export-based trade, tourism, and other services. Nepal being a landlocked, mountainous country, with a difficult geographical location, must focus on the development of renewable energy, hydroelectricity, industries, business & entrepreneur activities, agriculture, tourism and other services. For increasing the commercial activities as mentioned above, here comes the banks and financial institution's role which work as lifeblood for any organization to operate. Banks and financial institutions are the one, that channelizes funds from lenders-severs (Surplus economic unit) to borrowers-spenders (Deficit economic Unit)

In today's world where business is operated globally and all the countries are involved in international trade and business. The role of banks has even increased because business activities cannot be performed only on the trust of the individual person. There must be an established institution who are licensed to perform financial service and recognized by all. All businesses need financial institutions where they can trust and minimize risk whether it is within the country or beyond.

The bank is the major source of external financing for business, rational individual investor hesitates to invest directly in the real sector because of their inability to acquire and understand information. Banks are an investment option for them, as it economizes the transaction cost by handling a large volume of the fund and using their expertise to make better decisions. It also encourages individuals who do not have financial knowledge but have ideal money to invest in high-interest-bearing FDs and mobilizes those financial resources into productive activities. Nowadays, with the help of technology, banks are handling huge amounts of funds with a lesser number of people. They have their own app by which customers can pay bills, transfer, and receive money, it's transforming into a cashless society. Modern Bank performs and provides very broad financial activities and services, and are still increasing, because of which off the balance sheet activities and income has increased.

All financial institutions basically perform two main functions. First, they collect the surplus fund, and second, they deploy those funds to the deficit economy. Under the

financial institutions, there are Banking Financial Institutions and Non-Banking Financial Institutions. Non-banking financial institutions include investment and merchant banks, leasing companies, Housing finance companies, insurance companies, and other MFIs and their liabilities are financial claims. Here in these studies, I am focusing on banking financial institutions. Bank in real financial term, it is regarded as financial institutions whose liabilities is only money. Only central bank can print the money and commercial bank can create the money by issuing loans. Commercial bank as a whole can create the money reciprocal times of its required reserve. So, commercial banks have a very crucial role in the country's economy. They are the most important and biggest source of external funds to finance business. They even have a bigger role in an underdeveloped country like Nepal, where commercial banks not only have to think about profit, rather have to finance lots of developmental projects as well. As the bank has huge role in countries economy, it is one of the biggest sectors, whose stock's has huge market capitalization portion of capital market (Nepal Stock Exchange) and investment opportunities for investors.

### **1.1.1 Banking History of Nepal**

The modern banking system in Nepal started on the 15th of November 1937 A.D, when Nepal Bank Ltd was established. This was the effect of the First World War, after which the new revolution and industrialism developed all over. Then on April 26, 1956, A.D. Nepal Rastra Bank (Central Bank of Nepal) was established under the Nepal Rastra Bank Act 1955. It issued its first Nepali note on February 19, 1960. The government established another commercial bank named Rastriya Banijya Bank (RBB). After this, banking activities continued to increase, and thus in the recent year, the number of banks and finance companies are increasing rapidly. Nepal government adopted a liberal policy regarding the financial sector and opened the venue for joint venture banks in 1984 and many joint venture banks came into existence. In Nepal, there are four categories (Class) of depositary institutions which are 23 A- Class commercial bank, 20 B-class development banks 22 C-class finance companies, and 85 D-class saving and credit cooperatives and other financial intermediaries. NRB (2022)

## **1.2 Statement of the problem**

Investment is the sacrifice of present financial resources by postponing current consumption and deploying funds for deriving additional returns and growth in the future. Therefore, it is a very crucial decision, where, there is a huge chance of loss if the informed decision is not made. To get an expected reward on investment, careful analysis of the fundamentals of stocks is a must. But there arises the problem for many investors who lack proper knowledge and education about stock valuation, portfolio management, risk and return analysis, and diversification. According to the data of Centralized Depository Service and Clearing limited there are more than 53 lakhs beneficial owner dematerialization accounts in Nepal till July 2022. In 2019 there were only around 15 lakhs, the number doubled in 2020/21. And crossed 53 lakhs in mid-July 2022. This increased number is mostly from the non-financial background. With the online facility of CDSC, there are more than 44 lakhs Mero share accounts. They are applying for IPOs and FPOs even to fundamentally poor companies. Most of the companies are being oversubscribed, and many companies' stocks are oversubscribed by 149 times. (RIJAL, 2020) Even the biggest IPO of Nepal, NIFRA IPO of 8 crore kitta worth of (NPR 8,00,00,00,000) was oversubscribed by 2.21 times. (Share Sansar, 2021) Now the number is increasing in the secondary trading market as well. During 2019, Nepal Stock Exchange (NEPSE) index was juggling around 1100 to 1300 index points. Suddenly during the covid-19 period, the NEPSE index crossed the all-time 2100 index point in 2020. After that every opening day it breaks the highest record and reached 3000 index points. On 18 august 2021, it touches 3298.60 index points. And again within 7 months it loses 1330 points and falls to 1868 points in June 2022.

The stock market of Nepal is very volatile. Due to a lack of proper monitoring and supervision by the regulatory authority, there have been numerous unethical

manipulations by a few players. There are many cases of insider trading, leaking of inside information by companies' staff, and involvement of government officials in unethical activities. Even the chairman of the securities exchange Board of Nepal including many high officials were found to purchase a huge number of shares in the name of a family member unethically. (Investopaper, 2021). There are also groups of stock market player who owns online channels, and YouTube channel through which they misinterpret the information and take advantage. The big player even influences the speech of the political leaders, governor, and finance minister, where they comment about NEPSE positively & negatively.

Because of all these issues, here arises the problem of selecting bad companies' stocks rather than selecting good companies with better fundamentals. As the investor can be carried away to make irrational decisions and may lose their investment.

### **1.3 Objective of the Studies**

The prime objective of the studies focuses on the analysis the of common stock of Nepalese commercial banks. It focuses on the associated risk and possible return in the banking sector of Nepal. It tries to study commercial bank risk and return, whether the banking sector ratios and other indicators are better than other sectors or not. It also tries to find out which is the better stock to invest in to reduce risk and increase returns.

The main objectives are:

- To find out overpriced and underpriced stocks among the sampled commercial banks.
- To find out the degree of risk depending on the level of returns.
- To figure out whether the bank's stocks are aggressive or defensive in comparison to market volatility.
- To find out the level of systematic and unsystematic risk of stocks



- To analyze the factors which influence the risk and return and their significance.
- To make the comparative analysis based on calculated results.

### **1.4 Focus of the Studies**

This study focuses on the fundamental concept of investment return and risk in commercial banks' stock performance on the Nepalese stock exchange. It dives deep into the listed A-class commercial bank's stock analysis in terms of its risk and rewards to investors. It focuses on finding and comparative analysis of which bank's stock is better for investors to invest in. It uses different measures, tools, and concepts of measurement and understanding risk-return. A return on common stocks comes in two ways, they are from dividends and stock price appreciation. There is a focus on studying prices at different periods and their return and measuring their performance based on the results.

### **1.5 Significance of the studies**

The significance of the studies is to discover the riskiness in the commercial bank's stock and its possible returns. This paper may be useful to those investors who are seeking figure out investment options.

### **1.6 Limitation of the Study**

The main limitation of the studies is unable to address the macro-environment variable such as political situation, market condition, government regulation, and tax policies, interest rates, and inflation. These factors affect the stock risk, return and firm earnings both positively as well as negatively. These factors are external to the firms and affect the whole economy and market and cannot control by a single firm or particular industry.

## **1.7 Organization of the study**

This research papers include the following contents:

The first chapter is the introduction which covers the background of the commercial bank, their role, their stocks, the banking history of Nepal, problem in investing in stock, objectives, focus areas of the studies, significance, limitations and organization of the study.

Chapter two is the literature review in which, I have analyzed different articles, journals, books, websites, and scholarly journal articles. It has two parts first is the conceptual review which covers the current market conditions, banks current position, stock market condition, concept of risk, return, method to measure risk and about how to make decision based on risk and return results. Second part of the literature review consist of related article, and journal review, past research on related filed based on which I have selected the variables influencing risk and return.

Chapter three consists of research methodology which includes methods, design, types of data, details about population and samples, analysis tools and technique etc.

Chapter four consists of the analysis and findings of the study, where I have used excel to analyze and calculate, return, standard deviation return, variance of return, coefficient of variation, and correlation between stocks, market and banking sectors, I also use regression to analyzed significance of factors affecting risk and return.

In chapter five I have given the conclusion and recommendation of my study.

## **Chapter 2**

### **Review of the literature**

#### **2.1 Conceptual Review**

This part deals with the review of basic concept of stock market scenario in Nepal, banks position review, concept of risk, return, portfolio, and diversification.

##### **2.1.1 Review of Financial Investment Environment in Nepal**

Investment is the sacrifice of present financial resources for acquiring assets with the objectives of generating income in the future or appreciation in the value. It is concerned with the initial cash outflow with an aim of getting higher payoff in the future. (Hayes, 2021). Assets could be real or financial assets. Real assets are tangible assets such as land and building, plant and machinery, automobiles, etc.

Whereas financial assets are the claims over the income generated by real assets which are represented by piece of paper or the computer entries in digital form like common stock, bond debenture etc. in intention of earning interest, dividend, premium, value appreciation etc. Generally, the financial market is understood as the investment environment.

Nepal financial investment market is still in developing stage. Common stock and government securities are very popular in Nepal. Corporate bonds and preferred stock are available in very limited number and not very popular. Option, forward, financial future, and swaps are not available in Nepal. (Panthi & Chalise, 2021)

### **2.1.2 Overview of Nepalese Stock Exchange.**

Capital market of Nepal has history of 46 years first started with the establishment of the Securities Exchange Centre in 1976 A.D. later on 1983 Securities Exchange Act was promulgated. On 1993 same Securities Exchange Centre was converted into Nepal Stock Exchange (NEPSE) which is the only secondary stock Market in Nepal today, that conducts an auction market in listed securities. The regulatory body of the capital market is the Securities Board of Nepal.

NEPSE started an automated screen-based computerized system for trading in 2007 and in 2016 they introduce a fully automated screen-based trading system which adapts the principle of the order-driven market (Rijal, 2022). SEBON has adapted the collective investment. Where the trading floor is open with 50 licensed brokers from Sunday to Wednesday from 11 A.M to 3 PM and Friday from 11 A.M to 1 PM. With the help the of Trade management System TMS customers can buy and sell their stocks script easily. This has brought very high liquidity of shares in Nepal. So, people are so attracted to investing in the stock market resulting more in than 53 lakh DMAT accounts. (Investopaper, 2021)

### **2.1.3 Review of Nepalese commercial Bank Position In NEPSE**

Banks are the most heavily regulated sector in the world. They are tightly regulated and monitored by the monetary authority of the country (Central Bank), Ministry of finance and also from the security exchange board. (Hadjiemmanuil, 2015). They also need to maintain the international banking ethics and standard for international settlements, SWIFT, and other various services. Because, the banks are compelled to strictly publish its financial report on quarterly basis, all the information are publicly available which is reflected in their share price movement as well.

In the context of Nepal, the stock market has always been dominated by the bank's common stocks. In 2000/01 banks shares was 62.4 percent out of the total market capitalization. It is still high on NEPSE at mid-July 2021 (Ashad's 31 which is Nepalese fiscal year-end for 2021/22), which was NPR 4.01 trillion, only commercial Bank's market capitalization was NPR 1.51 trillion which becomes around 37.7 percent of Total market capitalization. If we see the data of CDS and clearing a house there are 8.843 billion units of Common stock in DMAT out of which 3.295 billion are common stock of Commercial Bank. Which is around 37 percent of the stock in units. This is the highest among the 13 Sub-Indices of NEPSE.

## 2.1.4 Review of Performance of Nepalese commercial bank in NEPSE

Table-2.1.4

NEPSE Standings As on End of July 2022				
Index	Current index point	P/E Ratio	Price to Book value	Divident Yield
NEPSE	2140.39	26.67	3.12	3.12%
Banking	1392.28	14.28	1.66	4.43%
Development Bank	4072.12	28.8	2.93	2.96%
Finance	1989.16	51.26	3.23	2.84%
Microfinance	4934.79	34.57	6.74	1.68%
Trading	2077.83	28.32	3.42	0.25%
Hotels and Tourism	2978.62	102.25	5.07	1.90%
HydroPower	2533.47	26.34	3.29	2.77%
Manufacturing .& Processing.	5379.59	8.97	1.07	4.04%
Life Insurance	9958.43	72.6	4.14	1.52%
Non Life Insurance	8291.16	31.64	2.94	2.31%
Investment	70.78	69.52	4.23	1.22%
Others	1618.83	41.17	2.76	1.07%

Source: Nepal Stock Exchange (NEPSE)

If we see the overall performance of the Nepal Stock Exchange, here also Commercial Bank's performance is better in comparison to other industries/sectors. If we see the data for the 29th of July 2022.

If we see the index point of commercial bank it stands at 1392.28 with second lowest Price to earnings ratio. And Commercial banks stock P/E ratio is lower than that of NEPSE. Price to book value of is 1.66 times which is again second lowest. Manufacturing and processing companies most of the stocks are held by promoters because of which they don't sell in the market. The dividend yield of the banking sector is highest, even higher than the NEPSE Yield. This indicator shows that the bank's

performance is better in comparison to others. Their prices truly reflect almost all the available information. As bank capital is huge, a single person or a few big players cannot manipulate the price.

### **2.1.5 Concept of Return and Risk**

Risk and return are the two sides of the coin, where the existence of only one is almost impossible in the real world. Return is the ultimate objective of any investor. Every investment decision has a certain risk and return. Risk can be for a single stock or a group of stocks called a portfolio. Return expected from any investment is related to the degree of risk involved, Higher the level of risk higher will be the expected return, and vice versa. There is a direct and close relationship between the risk and the return. Investors are compensated by the return for the risk they undertake. In the investment world, it is assumed that investor always tries to maximize the returns and minimize risk. And Investors will demand higher returns for the given level of risk. If we analyze the patterns of investors when credit ratings of a company increase from “AAA” to “AA” and “A” the required rate of return also increase. As a result, we can conclude that expected return and expected risk have a positive relationship.

Investment is the sacrifice of the present financial wealth which is certain in expectation of getting the reward in the uncertain future. So, we can say that it is the present (certain) sacrifice for future uncertain benefits.

If we look into any industry/sector, we can find the average return. If we have a portfolio, we have an average portfolio return. But most of the individual stock script returns will differ from the portfolio average. Some will be higher and some will be lower. If the stock’s return extremely deviates from the expected return, there will be more risk and vice-versa. Where expected return depends on the country’s real risk-

free rate, inflation, probability of default, maturity risk, liquidity risk, and other industry-specific risks, from this discussion we can conclude:

**Return:** Return is the reward for undertaking the investment which is the ultimate objective of any investor. Return is the compensation for taking a risk, where the higher the risk higher the required rate of return. Return could be from earnings (dividend) and capital gain in stocks. (Hayes & Scott, 2021). It is the payment made to the owners in a form of dividends and capital appreciation on the stock in comparison to the price paid by owners for owning stocks. Sizable fluctuation in the price of stocks resulting in a substantial capital gain or loss will impact on the return of stocks. Total return in stock is the current income in a form of dividends and the capital gain or loss in comparison to the price paid.

Analyzing all the market and industry, the investor has certain expectation from the investment and if not seems to be fulfilled they will not invest called the required rate of return. It is the minimum rate of return that the investor is willing to undertake the investment option. If the return from the stock is less than the required rate of return, the investor will not invest. Therefore,

**Required Rate of Return (K)** = Real rate of return + expected inflation premium+ risk premium on investment. Where, risk premiums are default risk, maturity risk and liquidity risk.

Return can be measured in various ways, where we can measure based on historical data called as historical returns. It is the return over the passage of time. It consists of average return, Holding period return. We can also calculate expected rate of return based on the past trend.

**Risk:** Risk is the uncertainties about the future return. It is the fluctuations or the variation of return from the expected mean rate of return. The risk could be the probability of losing part or the whole invested amount. (CHEN, 2020). It is the degree of uncertainty of financial assets' return and affects the demand for those assets. And demand brings fluctuation in market price. if the market price rapidly goes down, investors may suffer huge capital loss which is regarded as a risk.

There are major two sources of risk, which are systematic and unsystematic risks

$$\text{Total Risk} = \text{Systematic Risk} + \text{Unsystematic Risk}$$

### 2.1.6 Systematic and Unsystematic Risk

**Systematic Risk:** Systematic Risk also known as market risk is the non-diversifiable risk. Systemic risk affects all or most of the investments which cannot be diversified. Risks include economic risks like recession, political situations, conflict, insurgency, war, inflation risk, market risk, tax risk, event risk, foreign exchange risk, etc. Systematic risk is perfectly correlated among all the stock scripts. Because they are moving in the same direction. (Beja, 1972)

Systematic Risk = function of (movements in general market, interest rate, inflation, and state of economy)

**Unsystematic Risk:** Unsystematic Risk is the variability of a return due to factors like management, goal settings, knowledge, technology, etc. which are sector-specific, firm-specific, industry-specific, or a particular business risk where risk can be reduced with the help of a portfolio diversification. The relationship among the stocks is uncorrelated. It arises from internal factors like (Mokkelbost, 1971)

- It is diversifiable, controllable, and unique to particular stock, sector, or firm.

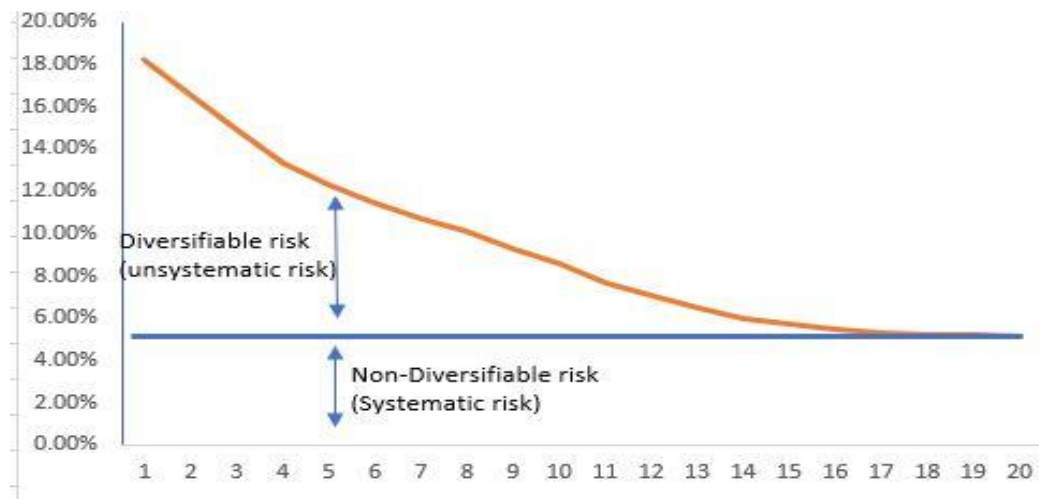


- Business risk, financial risk, liquidity risk, etc.

### 2.1.7 Unsystematic risk reduction through Portfolio

Markowitz (1952) in his portfolio theory tells us that do not put all eggs in a single basket. A combination of two or more two securities held by an investor is known as a portfolio. Investing all available funds in one stock is too much riskier if the respective stocks fall. Their rational investor will spread their investment in more than one asset to reduce the degree of risk.

Figure 2.1.7



Here, in the figure, the x-axis is the number of stocks, and the y-axis is the risk (standard deviation) where we can see that regardless of the addition of the stocks to the portfolio, the systematic risk remains the same. And unsystematic risk got reduced with an increase in the stock in the portfolio.

Therefore, in a well-diversified portfolio, there is no unsystematic risk (diversifiable risk) and total risk is only equal to systematic risk because diversifiable risk has already been diversified.

So, we can conclude that investors are compensated only for taking the systematic component of total risk.

## **2.2 Review of the related journals, articles and thesis.**

This part deals with the review of the research and study conducted in the particular field by various researchers and authors about, risk, return, portfolio, and diversification.

Kandel (2018), in his secondary data-based studies on “Risk and return analysis of commercial banks of Nepal concerning NABIL and NIBL” found that all commercial banks of Nepal have fluctuated rates of return and are very risky. Studies also found that there is a positive relationship between risk and return. Studies found that most investors are investing in single assets and hence suggested them to construct an appropriate portfolio to reduce the unsystematic diversifiable risk. He uses the beta coefficient, standard deviation, coefficient of variation, and portfolio risk and returns to calculate expected return, variability of return, and volatility of stock and market. He also found the very high proportion of unsystematic risk involved in the bank’s stock and the correlation between the banks is positively correlated. He also found that the common stock of NABIL bank is very volatile in comparison to NIBL’s common stock. It was found that the required rate of return of both banks is higher than the expected rate of return indicating both stocks are overpriced and hence, suggested short selling. It also concluded that the existence of a high proportion of unsystematic risk is better because it can be reduced to zero with diversification.

(Adhikari, 2018) conducted the risk and return analysis of commercial banks in Nepal with the objectives of finding out the return of common stocks of the commercial bank where he calculated and analyzed market return and market risk, diversifiable and

undiversifiable risk of banks stock, total risk and return position to find out whether the stock is overpriced or underpriced using various statistical and financial tools. He uses CAPM, Annual Return, Market return, and the expected rate of return, for calculating return and standard deviation, coefficient of variation, beta coefficient, and correlation coefficient to calculate risk. The study particularly talks about the different variables of risk such as interest rate risk, bull-bear market risk, default risk, liquidity risk, industry risk, political risk, etc. which influence the stock price and earnings of the banks. The study focused on four banks of Nepal for 10 years of data from the fiscal year 2007/08 to the fiscal year 2016/17. Banks were Himalayan bank, Everest bank, Machhapuchchhre bank, and Siddhartha bank. The study concluded that the MBL was performing best and EBL was performing worst. It also found that the average commercial bank return was close to the market return of 13.49%. The beta coefficient of commercial banks indicates high risk for some banks and low for some banks' stock. He figured out that the correlation coefficient of banks was -0.33 which is negative and lower than 1, Hence, suggesting that risk and return between the bank's stocks were negatively correlated. The required rate of return of HBL and MBL was found to be less than the average rate of return so the stocks were underpriced, suggesting buy and required rate of return of EBL and SBL were higher than the average rate of return, so the stock was considered to be overpriced suggesting sell.

(Paudel, 2002) to analyze risk and return characteristics and investing decisions on Nepalese commercial bank shares analyzed the correlation coefficient of individual stock return with the market return portfolio. He segregated systematic and unsystematic risk from total risk and analyzed the stock's beta to calculate the minimum required rate of return and compared them with actual returns to find out over and underpriced using the CAPM model. The study claimed that the expected return on

stock investment come from dividends and capital gain/loss. It says that in an efficient market, the market price of the stock will more or less move towards its intrinsic value, therefore stocks' intrinsic value is one major aspect of the price of the stock was calculated by discounting all future cash flows to present. The net worth of stock or book value is also a factor for price change. Studies also talk about the market hypothesis, where the availability of information is reflected in the price. The study conducted from 1995/06 to 2000/01 on the joint venture banks NABIL, NIBL, HBL, SBI, NBB, EBL, and BOK concluded that most of the stocks were defensive and less volatile in terms of risk as their betas were below market beta of 1. It also concluded that all stocks generate a higher return than the market portfolio return of 5.51% but their risk seems not to be the same. It found that stocks having higher standard deviation were producing a higher rate of return. Stocks with negative or low beta were having a higher proportion of unsystematic risk. The coefficient of variation of a bank's stock was found to be less than the market. All banks' correlation was found to be less than 1 indicating less volatile than the market and only NABIL bank stocks were moving in the opposite direction from NEPSE.

(Niroula, 2021) conducted the research based on the secondary data of stock price behavior of commercial banks of Nepal. In his research, he took 18 banks as a sample out of 27 banks and data from the 2015/16 to 2019/20 fiscal year. The main objectives of the studies were to find out the impacts of EPS, P/E Ratio, Dividend yield ratio, bank size, Return on Equity, Book value per Share, and Return on equity on Market price per share. Studies found that EPS and PE Ratio, Dividend yield ratio, and book value per share have a positive correlation with the bank's Market Price, which means an increase in these variables will increase the stock price. The size of the bank has a very weak negative correlation with MPS. Studies found that (Earning Price Per Share,

Price/ Earnings ratio, Dividend Yield, Size of the bank Return on equity, Book value per share, and Return on Assets) has a significant effect on the price of the stock by more than 95 percent. Book value per share and ROE has negative and very weak effects on Market price per share.

Tandon, K., & Malhotra, N. (2013). In their study “Determinants of stock price an empirical Evidence from NSE 100 companies” analyze the various variable that influences the market price of the stock of 95 companies out of 100 companies on the national stock exchange of India from 2007 to 2012. It was based on secondary data. The studies focused on finding out the impacts of the book value of the share, earning per share, dividend per share, dividend yield, and price-to-earnings ratio. it is very difficult to make the correct prediction of the stock price to earn a good expected rate of return. There are many internal and external factors or variables that influence the movements in the price of shares. Therefore, the studies specifically with the objectives of finding out the relationship between the market price stock and variables such as book value, dividend, earning, P/E ratio, dividend yield, payout size, and net worth. The studies took the market price of the stock as the dependent variable and other above mention variables as independent variables. The studies found that the book value, earnings per share, and price-to-earnings ratio are having significant positive relation with the stock price and dividend yield has significant negative relation with the market price. It concluded that this four-factor has around 52 percent impact and the price of the stock and the remaining 48 percent are still unknown and unexplained.

Islam, M. S., & Adnan, A. T. M. (2022), on the study of determinants of dividend policy of banking sector of Bangladesh explained the influencing factor for banks dividend

distribution decision. It studied 22 banks of Bangladesh listed on the Dhaka Stock Exchange from the fiscal year 1999 to 2018. The study concluded that retain earnings, leverage and size are important elements of dividend payout decisions, and earning per share, cash flow, sales growth, liquidity, risk, tax rate, ROA, investment opportunities, and retained earnings have an insignificant relationship with the dividend decisions.

Pradhan, P., Shyam, R., & Dahal, S. (2016), conducted to examine the factors which affect the stock price of commercial banks in Nepal, the study took MPS as dependent variables, and EPS, DPS, P/E Ratio, Book value per share, ROA and firm size as firm-specific variables. The study took GDP, inflation, and Money supply as economic variables. The study used secondary data from 14 commercial banks from the fiscal year 2002/03 to 2013/14. The study concluded that the EPS, DPS, P/E ratio, book value per share, ROA, and firm size have major impacts on the market price per share. And all three taken economic variables also have a positive effect on price.

Thapa, K. B. (2019). In the study of influencing factors of the stock price in Nepal based on the commercial bank from the fiscal year 2008 to 2018. The study focused on what factors triggered market price fluctuation and volatility and the study revealed that earnings per share, dividend per share, rules and regulations, market rumors, and company profiles have a significant positive association with the market price. Price-to-earnings ratio and interest rate have a negative association with market price per share. It also found that the stock market of Nepal is very sensitive to dividends and interest rates.

Utami, W. R., Hartoyo, S., & Maulana, T. N. A. (2015), conducted a study of various internal and external factors affecting stock return. The study focused on Indonesian Stock exchange data from 2010 to 2014. The study took the beta coefficient to make an

investment decision based on the aggressive or defensive stock. The study found that quick ratio, debt to equity ratio, and P/E ratio have significant negative effects on stock return. It also found that Inflation and Interest rates have a significant negative effect on stock return whereas legal regulation has an insignificant negative effect on the return of stock

Gautam, R. (2017), studies of the impact of firm-specific variables on the stock return and price movement of Nepalese commercial banks from the fiscal year 2008/09 to the fiscal year 2015/16. It took firm-specific factors such as market capitalization, leverage ratio, DPR, growth of Assets, P/E ratio, dividend yield, and price to book value. The study found that there exists a positive relationship between market capitalization, leverage ratio, DPR, and dividend yield with the stock return. It also concluded that market price to book value, growth of Assets, and EPS have a negative relation with the return.

Rahaman, M. M., & Akhter, S. (2016), in their studies on bank-specific factors influencing the profitability of Islamic Banks in Bangladesh examine the impacts of specific firm-specific factors on the profitability of the banks from the period between 2009 to 2013, based on secondary data of eight Islamic banks. The study took bank size, deposits, Return on assets, loan mobilization, and operating expenses. The study found that bank size and deposits have a significant negative impact on return. Capital adequacy has significant positive relation and loan and operating expenses have insignificant impacts on return.

Gunawardhane, H. P. T. D. (2022), the study of the impact of Company-specific and Macroeconomic factors on Company Performance: Evidence from the Insurance Sector in Sri Lanka on both firm-specific and macro-environment from 2010 to 2019. The

study took Capital structure, capital adequacy, firm size, liquidity position ROA, ROE, and EPS as firm-specific variables and Inflation, GDP growth, and Interest rate as macro-economic variables. It studies the impacts of both inside and outside factors on the performance and profitability of the firm. It found that capital adequacy, and structure, have a significant negative relation with performance and profitability. Size has a positive relationship with the market performance of stock. GDP growth rate has negative relation. It concluded that GDP growth rate, size, and liquidity position are the factors that affect the market performance of the stock in Sri Lanka.

Abbas, F., Iqbal, S., & Aziz, B. (2019). The study of the impact of banks' capital, liquidity, and credit risk on profitability found that there exists a positive relationship between a bank's profitability and capital. It was found in both the Asian and American markets

### Summary of Literature Review of Factors Influencing Return/Risk

**Table-2.2**

S. N	Authors/ Researcher	Factor Identified		Year & Market
		Internal (Firm Specific)	External (Macroeconomic)	
1	Laxman Raj Kandel	Degree of Unsystematic	Degree Systematic Risk	2018, NEPAL
2	Ballav Niroula	EPS, P/E Ratio, Dividend Yield Firm Size, ROE, Book Value, ROA	-	2021 NEPAL
3	Malhotra & Tandon, N. & K.	Book Value, EPS, P/E Ratio, Dividend Yield	-	2013, INDIA
4	Pradhan, P., Shyam, R., & Dahal, S.	EPS, DPS, P/E Ratio, Book Value, ROA, Firm Size,	GDP, Inflation, Money Supply.	2016, Nepal
5	Utami, W. R., Hartoyo, S., & Maulana, T. N. A	Quick Ratio, Debt to equity ratio, ROE, EPS, P/E Ratio,	Inflation, interest rate, Exchange rate Legal aspect	2015, Indonesia



6	Gautam, Ramji.	market capitalization, leverage ratio, DPR, growth of Assets, P/E ratio, dividend yield, and price to book value	-	2017 Nepal
7	MD. Mustafizur Rahaman & Sharmin Akhter	bank size, deposits, Return on assets, loan mobilization, and operating expenses	Market movements,	2015, Bangladesh
8	Gunawardhane, H.P.T.D, Wijesinghe, M.R.P & Kavinda, D.D.C	Capital structure, capital adequacy, firm size, liquidity position ROA, ROE, and EPS,	Inflation, GDP growth, Interest rate	2022, Sri Lanka
9	Kibet, M. (2018)	firm size, branches, customer deposits, capital, and loan book mobilization.	-	Kenya, 2018
10	David T. Clark	Firm Age	-	The United States.,2008
11	Martani & Khairurizka	financial ratios, firm size, and cash flow from operating activities	-	Indonesia, 2009

**Based on the literature review,**

**Earnings-Per-Share (EPS):** Earning per share is the earning power of stock indicating income per unit of stock. Stock with higher earnings per share is performable as it is expected to generate higher returns and has low risk in buying those stocks EPS has a positive significant relationship with the stock return. (Hertina, Haizam, & Saudi, 2019)

**Price Earnings Ratio:** The price-earnings ratio is the amount of money willing to pay by investors per unit of reported profits. High P/E ratios are mostly enjoyed by well-established fully-grown companies as result there is a high return in high price along with high risk. it's been perceived that low P/E ratio stock will perform better but low P/E indicates a low price in the market so there is no chance of getting high capital

gains, rather is expected to generate higher returns and have a relatively lower risk. (Liem & Basana, 2012)

**Return on Equity (ROE):** It is the amount of return per unit of the bank's owner's equity. It's a kind of interest to the equity holders. It gives each unit the amount invested on equity and the amount it has made in profits. (Mishkin, F. S. 2010)

**Return on Assets (ROA):** The return on assets gives us information about the efficiency of banks indicating how much profits are being generated on average by each unit of amount/assets employed for productive investments. It is the net profit after tax per unit of assets. There exists direct significant relation between return and assets. And higher ROA is considered to be efficient management of assets.

**Net Worth:** it is the per unit theoretical value of the stock which can be obtained by the value of total equity of the number of shares. A higher net worth is regarded as better for return. It is also a kind of residual value for equity holders. High net worth is regarded as less risky. (Rosengberg, reid, and Lanstein, 1985) found that there exists a positive significant relationship between current values and future stock returns.

**Capital:** capital adequacy management is a crucial part of the Banking sector. Capital is the only shock absorber for the banks to save from the risk of failure. Therefore, adequate capital must be maintained by the bank to meet obligations toward depositors and other creditors. If it is maintained at a very low it will give high returns to the equity holder but it increases the risk and if maintain very high capital it reduces the returns. Mishkin, F. S. (2010).

**Non- Performing Loan (NPL):** A non-performing loan is the amount of loan that the borrower failed to pay back to the principal or interest or both to the issuer. It is a bad

debt to banks and directly impacts the profitability of the bank. And it is a risk to the banking sector. Singh, S. K., Basuki, B., & Setiawan, R. (2021). The non-performing loan has a very strong effect on profitability and is a risk to the firm There is a negative significant effect of NPL on return. Bhattra (2017). It says that the higher the NPL will lead to lower returns resulting in higher risk.

**Capital:** capital adequacy management is a crucial part of the Banking sector. Capital is the only shock absorber for the banks to save from the risk of failure. Therefore, adequate capital must be maintained by the bank to meet obligations toward depositors and other creditors. If it is maintained at a very low it will give high returns to the equity holder but it increases the risk and if maintain very high capital it reduces the returns. Mishkin, F. S. (2010).

**Loan Mobilization:** The primary source of the bank's profit is derived from the loan. It is the assets of the bank that where bank earns from the spread between the deposits and lending rates. The higher the loan mobilization, the higher will be the income of the bank but at the same time, there are high chances of the loan being defaulted called default risk. This risk can be seen in the NPL rate.

**Market Coverage (Based on Number of branches):** Bank plays a vital role in channelizing funds in the economy. If the bank has well market coverage with its branches in all parts of the country, it will give access to financial resources. Deposits will increase, and other financial activities will increase as a result which will increase the returns of banks. The effect of several branches on financial performance is found to be significantly positive. (Kibet, 2018)

**Firm Age:** The study conducted by Clark. D (2002) of Glucksman Institute for Research in Securities Markets found that technological firm has a negative significant correlation with stock performance as people underestimate the young growing firm

but they will outperform and will have strong prospects of growth as they can quickly adapt to the changing technologies. But a non-technological firm showed positive significant relation with firm age and their returns.

**Growth Rate:** It is the growth rate of earnings and dividends of a firm. If companies have the investment opportunities to generate higher returns than the current market required rate of return, they should retain the profit rather than distribute it. So, they can generate more returns in the future. It depends on the return that the company is deriving on equity. It is the reinvestment rate of return that depends on the retention of profits.

**Firm Size (Total Assets):** Assets are the resources that have production capacity. For banks, liabilities are the sources of funds and assets are the uses of funds. For banks, the biggest assets are loans, government securities, reserves, and cash. They also have physical capital. It plays a significant role in the returns of the banks. How many deposits banks collect and how much they lend determine the profit of banks. So, the size of assets can define the firm size and has a significant relation to returns and risk. (Martani & Khairurizka, 2009).

## **2.3 Hypothesis**

Based on the above discussion, the following hypothesis has been developed.

H1: Earning price per share has a positive significant relation with price & returns.

H2: P/E ratio has a positive significant relation with returns.

H3: ROE has a positive significant relation with MPS and returns

H4: ROA has a positive significant relation with MPS and returns.

H5: Net worth per share has a positive significant relation with MPS and returns

H6: bank capital has significant negative relation with the return.

H7: there is a positive relation between Loan mobilization and return/risk.

H8: There is a significant negative relationship between NPL and return and positive impacts on risk

H9: there is a positive significant relationship between firm market coverage and return.

H10: there is a negative significant relationship between firm age and return.

H11: growth rate has a positive significant relation with returns.

H12: The size of the bank (Assets) has a positive significant relation with MPS and returns.

## **Chapter 3**

### **Research Methodology**

Based on the review of the financial market of Nepal, commercial banks' presence and performance in the Nepal Stock Exchange, a different concept of risk, return, portfolio, diversification, and measurement of risk and return and the related scholarly journals and articles. The following methods have been adopted.

#### **3.1 Research design**

Here, based on a review of the bank's stocks, this research is conclusive quantitative research where it tries to find out the performance of ten selected commercial banks of Nepal based on the risk and return, then based on the results obtained from different financial and statistical tools, it tries to give the conclusion and recommendations. I will be finding out individual banks holding period returns, based on that expected or mean return. And then individual risk using standard deviation and variance. Based on the risk and return analysis of individual banks, I will be giving weights to individual stocks and making portfolios. And finally, find out the portfolio return and risk diversification through portfolio construction.

#### **3.2 Population and Sample**

##### **3.2.1 Number of Commercial Bank in Nepal (Population)**

The total population size is all A-Class commercial banks of Nepal. Except then the banks whose trading has been halted due to either merger or auction, there are 23 banks

(NRB, 2022). All banks are public limited banks listed on the Nepal Stock exchange. Among the 23 commercial banks based on their paid-up capital, Global IME bank limited is the biggest bank with a paid-up capital of NPR 23.80 billion, followed by Prime Commercial Bank, Nabil Bank, NMB Bank, and Nepal Investment bank. they are the top five banks in Nepal. There are 10 banks with less than NPR 12 billion Paid up capital, and 8 banks have NPR 12 to 16 billion capital. And above 16 are the top five banks.

### 3.2.2 Sample

Out of the 23 commercial banks of Nepal, I am taking 10 banks as a sample for the study which is more than 43% representation of banks a and suitable sample size (Bullen, 2013). Also, after analysis of the selected bank's paid-up capital it has been found that these 10 banks occupy around 60 percent (589 billion out of 985 billion) of the total market capitalization of the banking sector. Therefore, it will be more representative. Selected sample Banks are:

Table- 3.2.2

<b>S. N</b>	<b>Name of the Banks</b>
1	Nabil Bank Limited
2	GBIME Bank Limited
3	Nepal Investment Bank Limited
4	NMB Bank Limited
5	Prime Commercial Bank Limited
6	Agriculture Development Bank Limited
7	Kumari Bank Limited
8	Nepal Bank Limited
9	PRVU Bank Limited
10	NIC Asia Bank Limited

### 3.3 Sources of Data

This study is based on secondary data. I have used published secondary data which are available on the websites of the Nepal stock exchange (NEPSE) websites of the

securities exchange board of Nepal (SEBON), the websites of Nepal Rastra Bank (Central Bank), CDSE and clearing house, and respective bank's annual reports, Quartey reports, financial statements, and other websites publishing information and data related to stock markets and banks. etc. as compared to the other sectors, bank data are publicly available in a prudent manner because of heavily regulated by regulatory authorities.

### **3.4 Coverage**

These studies have used financial data for five years from 2017 to 2021 of the respective banks for calculation and analysis purposes. It also sees the current market situation and gives judgment but for calculation purposes, the fiscal year 2022 is not yet completed so is not included.

### **3.5 Measurement of Variables.**

#### **3.5.1 Depended Variables**

Holding period return for each year is taken as dependent variables where the variation of return from the expected return is the risk. Therefore Risk/return is the dependent variable. where a low degree of flection and variation of percentage return from the expected return is regarded as a low risk whereas a high degree of fluctuation and variation in percentage return is regarded as a high risk.

#### **3.5.2 Independent Variables**

In independent variables, I am looking into the factors that influence the return of a bank's stock, and price in the market. Through the literature review, earnings per share,



P/E earnings ratio, Return on Equity, Return on Assets, DPR, Dividend yield, Net worth per share, Firm capital growth rate, Loan Mobilization, bank size, age of the banks, non-performing loan and growth opportunities is influencing risk and return of the banks.

Based on the different literature review following dependent and independent variables has been taken as the theoretical framework.

Measurement of risk: The degree of deviation of the return of stock from the expected return of the stock is the measurement of risk.

Return/Risk is the dependent variable and EPS, P/E ratio, ROE, ROA, DPR, Dividend Yield, Net worth, Capital Growth rate, Loan Mobilization, NPL, Bank size, and age of the firm are independent variables.

**Table- 3.5.2**

S. N	Depended Variables	Independent Variables
1	Stock Return/Risk	EPS
2		P/E ratio
3		ROE
4		ROA
5		Net worth
6		Capital
7		Loan mobilization
8		Non-Performing Loan
9		Number of Branches (Market Coverage)
10		Firm Age
11		Growth Rate
12		Firm Size

### 3.6 Data analyzing approach

I will be using Regression analysis between risk and return as the dependent variable and other selected independent variables for calculating the coefficient of each variable and testing their significance using the Excel regression analysis tool.

#### 3.7.1 Measurement of Return/Risk

##### 3.7.1 Calculation of return

- i. **Annual rate of return of commercial Banks:** It is the return that the investment provides return to investors over the period of time through dividend and capital gain or loss. Calculated as:

$$\text{Annual Rate of Return on Stock (R}_j\text{)} = \frac{P_1 - P_0 + D_1}{P_0}$$

Where,  $R_j$  = Return of stock “J”

$P_1$  = Ending price of stock

$P_0$  = Beginning price

$D_1$  = dividend for the period

- ii. **Average/ Mean return(  $\bar{R}_j$  ) =  $\sum(R_j) / n$**

Where,  $\sum(R_j)$  = Sum of Annual Rate of return.

$n$  = Number of observations

- iii. **Portfolio Returns:** It is the weighted average expected return of stocks included in the portfolio and weight is the proportion of total fund invested in each stock based on return and risk. Calculated as;

$$\text{Expected Portfolio Returns (ER}_p\text{)} = W_A \times R_A + W_B \times R_B + W_C \times R_C + \dots + W_Z \times R_Z$$

Where,  $W_A, W_B, \dots, W_Z$  are weight of respective stock on total portfolio

$R_A, R_B, \dots, R_Z$  are the return of Individual stocks

### 3.7.2 Calculation of Risk

The calculation of degree of deviation of return of the stock from the expected return is the measurement of risk which is calculated as follows.

- i. **Standard Deviation (Risk) of stocks of Individual Banks:** It is the most common quantitative statistical indicator of an assets risk measurement that quantified the total risk. It calculates the variability of the distribution of return around the expected average return (Sharkey,2022). Calculated as:

$$\text{Standard Deviation ( } \sigma_j) = \sqrt{\sum_{t=1}^n \frac{[R_j - E(R_j)]^2}{n-1}}$$

Where,  $R_j$ = Return on stock “j”

$E(R_j)$ = Mean return of Stock “j”

$n$  = no of observation

- ii. **Variance: It is the square of standard deviation calculated as:**

$$\text{Variance ( } \sigma_j^2) = \frac{\sum [R_j - E(R_j)]^2}{n-1}$$

**Decision:** Higher standard deviation and variance indicate high risk and low standard deviation indicate low risk. Therefore, lower is better.

- iii. **Coefficient of Variation of stocks of Individual Banks:** Sometimes, the standard deviation value might be equal or when the return is not the same from the stock it becomes difficult to make the decision. To deal with the problem, the coefficient of Variation is calculated. It measures the per unit risk and returns. Standard deviation measures the dispersion, whereas the coefficient of variation measures the relative dispersion. Calculated as:

$$\text{Coefficient of Variation of Stock “J” (CV}_j) = \frac{\sigma_j}{ER_j}$$

Where,  $\sigma_j$  = Standard deviation of stock j

ER<sub>j</sub>= Average return or mean return.

**Decision:** So lower Coefficient of variation is preferable.

- iv. **Covariation of between bank's stock:** Risk of the individual assets is measured by the standard deviation or the variance. But when we want to calculate the risk of the portfolio, we need to see the relationship between the two stocks. It shows whether the relationship between two variables is positive or negative. (CHEN, 2019). They are moving in the same direction if the results are positive and moving in the opposite direction if the results are negative. Calculated as:

$$\text{Covariance between Stock A \& B (COV}_{AB}) = \frac{\sum (RA - \overline{RA})(RB - \overline{RB})}{n-1}$$

Where,

RA = Return on Stock A

$\overline{RA}$  = Mean return of Stock A

RB = Return on stock B

$\overline{RB}$  = Mean return of Stock B

n= number of observations

- v. **Correlation between banks stocks:** Covariance gives us only the relationship between the variables but not the degree of the relationship. Negative and positive covariance gives the negative or positive correlation which lies between -1 to +1.

Therefore, if the Correlation coefficient between stocks = +/- 1, it's a perfectly +/- ve correlation. It is the base for portfolio construction where a negative or lower correlation and selecting the uncorrelated assets.

Calculated As:

$$\text{The correlation coefficient between stock A and B (r}_{AB}) = \frac{COV_{AB}}{\sigma_A \sigma_B}$$

Where, COV<sub>AB</sub> = Covariance between stock A and B

$\sigma_A$  = Standard deviation of stock A

$\sigma_B$  = Standard deviation of Stock B

- vi. **Beta coefficient: Measurement of Systematic Risk:** Systematic risk affects all investment returns but all stocks are not equally sensitive to the market. Some are more and some are less sensitive. Therefore, the Beta coefficient is the relative measure of systematic risk which give the level of systematic risk of a stock based on the market variance. The market is the average of all the listed stocks; therefore, it is assumed to be a well-diversified portfolio in itself and there doesn't exist any unsystematic risk as a result, the market beta is 1 i.e., 100%.

**Beta of Market ( $\beta_M$ ) = 1**

$$\text{Beta of stock A}(\beta_A) = \frac{r_{AM} \times \sigma_A}{\sigma_M}$$

where  $r_{AM}$  = Correlation between stock A and Market M

$\sigma_A, \sigma_M$  = Standard deviation of stock A and Market M

vii. **Capital Assets Pricing Model (CAPM)**

Treynor (1961), Sharpe (1964), and Lintner (1965) introduce CAPM as an extended portfolio theory of systematic and specific risk. It states that the expected rate of return of stock or portfolio is equal to the risk-free rate of return plus a risk premium. If the expected rate of return is not higher than the required rate of return, investment should not be taken. CAPM suggests considering only systematic risk to calculate the required rate as investors are not compensated by an extra risk premium for taking an unsystematic risk. According to CAPM, the Required rate can be calculated as:

$$\text{Required Rate of Return on stock A} (R_A) = R_F + [E(R_M) - R_F] \times \beta_A$$

Where,  $R_F$  = Risk-Free rate,  $E(R_M)$  = Expected return on Market, and  $\beta_A$  = Beta of stock A

$$\text{The proportion of systematic Risk} = r_{jm} \times \sigma_j$$

The proportion of Unsystematic Risk=  $(1-r_{jm}) \times \sigma_j$

Where  $r_{jm}$ = coefficient of correlation between stock j and market and  $\sigma_j$ = standard deviation of stock J

**viii. Portfolio (Risk) Standard Deviation:** It is the total risk of the portfolio. It considers the proportion of the fund invested in each stock of the portfolio, the riskiness of each security included in the portfolio, and covariance or coefficient of correlation between the stocks in the portfolio. Calculated as

$$\sigma_P = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + W_C^2 \sigma_C^2 + 2 \cdot r_{AB} \cdot \sigma_A \sigma_B \cdot W_A \cdot W_B + 2 \cdot r_{BC} \cdot \sigma_B \sigma_C \cdot W_B \cdot W_C + 2 \cdot r_{AC} \cdot \sigma_A \sigma_C \cdot W_A \cdot W_C}$$

where,  $W_A, W_B, W_C$  are proportion of fund on stock A, B and C,

$r_{AB}, r_{BC}$  and  $r_{AC}$  are coefficients of correlation and  $\sigma_A, \sigma_B$  and  $\sigma_C$  are the standard deviation of stock A, B, C

- ix. Regression analysis between risk and return as the dependent variable and other selected independent variables for calculating the coefficient of each variable and testing their significance using the Excel regression analysis tool.
- x. Comparative analysis between individual banks based on the results from calculation.

## **Chapter 4**

### **Data Analysis and findings**

#### **4.1 Introduction**

In this chapter, I analyzed the data using a multiple regression model for finding out the relationship and significance between my dependent variables (Return/risk) and independent firm-specific variables. Also, I will be analyzing banks' stock total risk, and stock volatility whether they are aggressive or defensive stock. How much is the diversifiable risk (unsystematic risk) and percentage of undiversifiable risk (Systematic risk) using standard deviation, variance, correlation, and Beta calculation.

#### **4.2 Data of the selected banks:**

Based on the selected variables following data has been collected and calculated.

**Table- 4.2**

Names of banks	Year	Return (In %)	Dividend (In %)	MPS	EPS (In NPR)	P/E Ratio (Times)	ROE (In %)	ROA (In %)	NET worth per share (In NPR)	Paid up capital In NPR Billion	Loan Mobilization In NPR Billion	NPL (%)	Number of Branches (Market Coverage)	Firm age (In Years)	Growth (%)	Total Assets in NPR Billion, (Firm Size)
Nabil	2017	-30.6	48	1597	59.86	25.44	22.41	2.69	270.00	6.19	89.15	0.8	55	33	4.44	131.35
	2018	-41.5	34	900	51.84	18.6	20.94	2.61	256.00	8.04	109.06	0.55	74	34	6.56	144.02
	2019	-5.9	34	813	50.57	15.82	17.76	2.11	257.00	9.01	127.50	0.74	82	35	5.82	194.98
	2020	1.5	35.26	790	36.16	21.15	13.61	1.58	256.00	10.10	148.05	0.98	118	36	0.34	237.68
	2021	87.1	38	1440	33.57	40.48	15.19	1.71	246.00	13.84	198.02	0.84	135	37	-2.00	291.07
GBIME Bank	2017	-20.7	20	395	25.51	15.21	19.33	1.75	153.17	8.08	80.82	1.6	112	10	4.18	117.89
	2018	-22.3	16	291	23.64	12.27	16.19	1.63	152.27	8.89	93.37	0.77	131	11	5.23	125.85
	2019	10.1	25.5	295	26.56	11.15	18.47	1.82	158.40	10.31	114.52	0.55	138	12	0.74	151.65
	2020	-8.8	16	253	17.99	13.29	12.88	1.06	151.95	18.98	201.25	1.76	257	13	1.42	273.88
	2021	86.8	13.5	459	19.25	22.9	13.53	1.21	151.26	21.63	243.76	1.41	273	14	4.04	345.42
Nepal Investment Bank	2017	42.1	40	780	29.3	26.3	16.6	2.06	176.00	10.63	104.62	0.83	61	31	-6.06	155.36
	2018	-23.6	40	623	35.7	17.4	14.7	2.13	234.00	10.65	120.83	1.36	77	32	-1.77	171.89
	2019	53.8	19	520	26.4	19.6	13	1.79	199.00	12.87	127.14	2.78	81	33	3.64	185.84
	2020	32.3	18.5	440	17	25.3	8.9	1.19	191.00	14.25	140.00	2.91	82	34	-0.79	203.02
	2021	34.9	16	460	22	20.9	11	1.56	198.00	16.26	161.91	2.46	86	35	3.00	227.93
NMB Bank	2017	-6.0	15.79	551	22.24	20.27	16.49	1.82	168.72	6.46	62.61	1.68	66	21	4.78	93.07
	2018	-29.8	30	357	21.86	12.48	13.54	1.08	216.88	7.60	75.65	0.88	96	22	-5.04	111.62
	2019	16.8	35	382	18.79	16.23	13.32	1.83	180.94	9.62	91.89	0.82	103	23	-11.49	135.47
	2020	12.4	16.2	413	11.18	31.45	8.94	1.09	150.06	13.95	121.78	2.68	133	24	-4.01	179.45
	2021	15.9	15.8	463	16.66	26.41	12.08	1.32	146.66	16.33	158.04	2.27	137	25	0.62	231.55
PCBL Bank	2017	-41.8	27	427	23.21	18.14	15.41	1.89	149.16	6.33	58.69	0.88	55	9	4.79	77.79
	2018	-28.3	16	290	21.49	13.36	13	1.82	139.52	8.03	71.17	0.85	64	10	3.32	95.04
	2019	3.4	16	284	23.6	11.78	16.08	2.15	143.84	9.32	76.30	1	73	11	5.18	102.26
	2020	-0.4	15	268	16.1	15.84	11.12	1.48	146.78	13.99	115.47	1.48	184	12	0.76	152.18
	2021	93.1	16.63	501	20.32	23.57	9	1.72	148.86	16.08	142.93	0.99	192	13	1.91	190.54
ADBL Bank	2017	-44.5	21.05	447	31.59	13.77	15.54	2.15	230.88	7.09	92.73	4.6	231	49	5.18	126.87
	2018	-24.8	21.05	315	36.91	8.51	16.47	2.71	305.31	8.51	100.17	3.5	257	50	7.08	134.85
	2019	39.4	30	409	42.88	9.54	17.11	2.77	314.49	9.02	111.75	3.29	259	51	5.14	151.46
	2020	1.7	15.79	400	31.45	12.24	13.23	1.86	297.92	9.56	123.38	2.84	270	52	6.59	179.32
	2021	32.3	21.05	508	29.13	16.44	12.44	1.59	286.67	10.99	151.47	1.88	278	53	3.45	222.44
Kumari Bank	2017	-33.5	12.75	335	13.29	24.61	11.12	1.29	119.98	6.88	45.20	1.86	36	16	0.45	60.99
	2018	-38.4	8.5	198	14.54	13.68	18.11	1.26	147.13	7.16	62.74	1.05	74	17	7.52	82.72
	2019	16.4	10.53	220	14.81	14.85	8.67	1.17	134.93	8.69	76.58	1.01	89	18	2.51	105.31
	2020	-5.0	14	195	12.08	15.39	9.93	0.76	137.92	12.52	115.13	1.39	106	19	-1.58	153.34
	2021	105.0	8.67	391	14.2	26.13	10.5	1.04	136.13	13.88	143.77	0.96	196	20	4.09	199.49
NBL Bank	2017	-21.0	0	379	38.77	9.39	7.57	2.78	287.00	8.04	71.02	3.32	161	80	7.57	130.23
	2018	-25.3	0	283	39.98	7.03	14.61	2.41	286.00	8.04	75.56	3.37	169	81	14.61	133.47
	2019	27.6	25	336	26.99	12.45	8.62	1.51	298.00	9.81	92.42	2.64	175	82	63.53	171.52
	2020	-18.8	16	257	20.68	12.04	7.77	1.22	266.00	11.28	103.30	2.477	203	83	1.76	191.16
	2021	85.6	17	460	23.43	18.9	8.91	1.33	263.00	12.64	135.42	2.05	213	84	2.44	222.65
PRVU Bank	2017	-29.1	0	410	27.17	14.94	19.29	2.58	140.86	5.88	64.30	4.55	141	3	19.29	92.62
	2018	-51.8	0	185	12.58	14.87	7.69	1.23	152.66	8.23	78.82	3.98	170	4	-0.03	112.59
	2019	49.5	25	266	21.03	12.65	12.45	1.92	161.04	8.89	90.25	3.76	189	5	6.22	137.89
	2020	-3.8	16	239	11.58	19.09	7.76	1.12	149.17	10.32	103.13	3.15	212	6	-3.52	167.52
	2021	103.5	17	478	15.17	30.13	10.06	1.21	150.80	11.35	142.26	1.68	215	7	4.48	215.51
NIC ASIA Bank	2017	-41.9	0	458	23.06	19.3	16.84	1.64	151.00	6.69	72.56	0.36	119	23	1.47	99.27
	2018	-28.7	0	316	16.62	19.01	12.09	0.97	145.00	8.03	121.75	0.06	231	24	4.43	170.94
	2019	48.4	25	448	34.22	13.09	22.73	1.56	169.00	8.83	150.11	0.46	292	25	8.75	220.59
	2020	31.7	16	570	31.89	17.34	19.26	1.32	177.43	9.72	173.74	0.75	336	26	7.18	250.59
	2021	86.8	17	1065	28.18	35.27	17.09	1.09	180.76	11.56	264.84	0.5	356	27	17.09	346.15

In table- 4.2, I have collected the required data of selected for calculation and analysis purposes as per the need and selected variables.



### 4.3 Return and risk analysis

**Table- 4.3**

Year	Return on Market	Banking Sector Return	Nabil Bank Limited	GBIME Bank	Nepal Investment Bank Limited	NMB Bank Limited	Prime Commercial Bank Limited	Agriculture Development Bank Limited	Kumari Bank Limited	Nepal Bank Limited	PRVU Bank Limited	NIC Asia Bank
2017	-8.19	-11.1	-30.59	-20.65	42.11	-6.00	-41.79	-44.54	-33.51	-21.04	-29.07	-41.86
2018	-24.94	-29.4	-41.52	-22.28	-15.00	-29.76	-28.34	-24.82	-38.36	-25.33	-51.80	-28.71
2019	4.57	11.2	-5.89	10.14	-13.48	16.81	3.45	39.37	16.43	27.56	49.48	48.43
2020	10.72	5.4	1.51	-8.81	-11.83	12.36	-0.35	1.66	-5.00	-18.75	-3.82	31.70
2021	113.77	72.3	87.09	86.76	8.18	15.93	93.15	32.26	104.96	85.60	103.52	86.84
Expecred Return	19.19	9.68	2.12	9.03	2.00	1.87	5.22	0.78	8.90	9.61	13.66	19.28
Stdard Devation ( Total Risk)	54.61	38.39	50.64	45.34	24.33	19.96	52.68	36.02	58.11	47.60	62.80	53.87
Coefficient of Variation	2.85	3.97	23.88	5.02	12.18	10.70	10.09	45.91	6.53	4.95	4.60	2.79

From table – 4.3, we can observe that the Nepal Stock exchange return is 19.19 percent and banks are performing less than the market of 19.19. Among the selected banks, only NIC Asia bank is performing above the market average return with minimum risk (coefficient of variation of) 2.79. followed by PRVU Bank, Nepal Bank, GBIME Bank, and Kumari Bank. the lowest return earning banks with maximum risk is Agriculture Development Bank with a return of .78% and per unit risk per return of 45.91, followed by NABIL Bank, Nepal Investment bank, NMB bank, and Prime Commercial Bank.

### 4.4 Relative Measure of Risk (Beta)

**Table -4.4**

Beta of respective Banks, Market and Sector	Names	$\frac{r_{AM} \times \sigma_A}{\sigma_M}$	Indicator
	Beta of Market		1.00
Beta Of Banking sector		0.69	Deffensive Stork
Nabil Bank		0.92	Deffensive Stork
GBIME Bank		0.81	Deffensive Stork
Nepal Investment Bank Limited		0.049	Deffensive Stork
NMB Bank Limited		0.22	Deffensive Stork
Prime Commercial Bank Limited		0.94	Deffensive Stork
Agriculture Development Bank Limited		0.40	Deffensive Stork
Kumari Bank Limited		1.03	Agreesive
Nepal Bank Limited		0.80	Deffensive Stork
PRVU Bank Limited		1.02	Agreesive
NIC Asia Bank		0.81	Deffensive Stork

In the above table Banking sector beta is 0.69 which is less than the market beta of 1. If we analyze the beta of the selected commercial bank, most bank has a beta of less than 1. This indicates that banks are less volatile in comparison to the market and have less risk. Only Kumari bank and PRVU bank's beta seem to be more than 1, hence they are aggressive stocks. It indicates that aggressive stocks should be selected during bullish markets as they quickly respond to market growth whereas defensive stocks are better to avoid risk during a bearish market. When the market falls, they resist to market.

#### 4.5 Calculation of Systematic Risk and Unsystematic Risk

**Table-4.5**

Banks Name	Total Risk (Standard Deviation= $\sigma_A^2$ )	Correlation between banks with Market ( $r_{AM}^2$ )	Sytematic risk ( $=r_{AM}^2 * \sigma_A^2$ )	Unsystematic Risk (Total Risk-systematic Risk)	% of Systematic Risk	% of Unsystematic Risk
Nabil Bank	50.64	0.99	50.265	0.37	99.26	0.74
GBIME Bank Nepal	45.34	0.98	44.320	1.02	97.75	2.25
Investment Bank	24.33	0.11	2.656	21.67	10.92	89.08
NMB Bank Limited	19.96	0.60	12.061	7.90	60.42	39.58
Prime Commercial Bank Limited	52.68	0.97	51.077	1.60	96.96	3.04
Agriculture Development Bank Limited	36.02	0.61	21.866	14.15	60.71	39.29
Kumari Bank Limited	58.11	0.97			97.21	2.79
Nepal Bank Limited	47.60	0.92	43.706	3.89	91.82	8.18
PRVU Bank Limited	62.80	0.89	55.773	7.03	88.81	11.19
NICAsia Bank Limited	53.87	0.82	44.179	9.70	82.00	18.00

If we see the above table, we can observe that percentage of systematic risk are greater in banks and has a low percentage of unsystematic risk. As from the previous beta also indicated that banks are moving with the market and are less volatile, except Nepal Investment, NMB bank, Agriculture development bank NIC Asia Bank and PRVU bank other bank has very less space to diversify the risk. Most of the risks are systematic and undiversifiable risks. But Nepal Investment, NMB bank, Agriculture development bank NIC Asia Bank and PRVU bank risk can be minimized through diversifying, so we have to select those banks and try to reduce the unsystematic portion of the risk.

## 4.6 CAPM Analysis

If we see in table number – 4.6, we can observe that the average risk-free rate is 3.06 percent for the past 5 years, and the market is giving 12.44 Percent. CAPM says that if the expected rate of return is not higher than the required rate of return, investment should not be taken. CAPM suggests considering only systematic risk to calculate the required rate as investors are not compensated by an extra risk premium for taking an unsystematic risk. Most banks are earning less than the required rate of return. Only two banks, PRVU and NIA Asia are earning higher than the required rate, so they are underpriced. Whereas the other 8 sampled banks are overpriced.

**Table- 4.6**

Capital Assets Pricing Model Analysis							
Banks Name	Risk Free Rate (Average 91 T-bill rate for last 6 Years)	Adjusted Market return (Average Return of NEPSE)	Beta of Respective Banks	Requird Rate= Rf + [ER(M) - Rf]*Beta	Expected Return From Table	Comparision	Result analysis
Nabil Bank	3.06	12.44	0.92	11.69	2.12	Req rate Return > Expeected Return	Overpriced
GBIME Bank	3.06	12.44	0.81	10.67	9.03	Req rate Return > Expeected Return	Overpriced
Nepal Investment Bank Limited	3.06	12.44	0.05	3.52	2.00	Req rate Return > Expeected Return	Overpriced
NMB Bank Limited	3.06	12.44	0.22	5.13	1.865	Req rate Return > Expeected Return	Overpriced
Prime Commercial Bank Limited	3.06	12.44	0.94	11.83	5.222	Req rate Return > Expeected Return	Overpriced
Agriculture Development Bank Limited	3.06	12.44	0.40	6.82	0.785	Req rate Return > Expeected Return	Overpriced
Kumari Bank Limited	3.06	12.44	1.03	12.76	8.904	Req rate Return > Expeected Return	Overpriced
Nepal Bank Limited	3.06	12.44	0.80	10.57	9.609	Req rate Return > Expeected Return	Overpriced
PRVU Bank Limited	3.06	12.44	1.02	12.64	13.663	Req rate Return < Expeected Return	Under Priced
NIC Asia Bank Limited	3.06	12.44	0.81	10.65	19.281	Req rate Return < Expeected Return	Under Priced

## 4.7 Regression Analysis.

Here I have tried to analyze using multiple regression. It explains the effect of independent variables (EPS, P/E ratio, ROE, ROA, DPR, Dividend Yield, Net worth, Capital Growth rate, Loan Mobilization, NPL, Bank size, and age of the firm) on the dependent variables (risk/ return)

#### 4.7.1 Summary of the model:

The analysis of regression shows how much of the dependent variables have been explained by the independent variables. Here excel data analysis tool (multiple regression) has explained in terms of R-value and R square value. R- square shows how much the total variation in the return/risk is explained by the regression model by independent variables.

**Table 4.7.1 Summary of multiple regression model**

Multiple R	0.807655
R Square	0.652307
Standard Error	29.59467

From the above table 4.7.1, we can observe that the R-square value is 65.23 %, which indicates that this regression explained about 65.23 % of risk/return by the variables. And the standard errors of 29.59% indicate that they are unexplained by the model. The remaining percentage is explained by the other variables and forces which are not covered in the study. So, I can conclude based on my regression result summary, that the variables that the study has covered have a significant influence on risk/return.

#### 4.7.2 Analysis of variables

ANOVA describes how much significant or insignificant influence does the independent variables have on dependent variables. F- statistic is a test of significance for the entire regression at a 5% level of significance. Regression is statistically significant if P-value is less than 0.05.

i.e.,  $P\text{-Value} < 0.05$ , then the regression is statistically significant.

**Table 4.7.2 ANOVA**

<i>F</i>	<i>Significance F</i>
5.784638	0.000017

### 4.7.3 Coefficient

In this part, the coefficient gives the contribution of each of the variables to the independent variables. and T- statistics is significant if the corresponding p-value is found to be less than 0.05. i.e., 5 % and the variable is important in determining the dependent variables.

Table 4.7.3

<i>Variables</i>	<i>Coefficients</i>	<i>T- Stat</i>	<i>P-value (Significance)</i>
Intercept (Constant)	-154.20	-4.15	0.0002
EPS (In NPR)	-2.58	-1.94	0.0606
P/E Ratio (Times)	2.55	2.64	0.0120
ROE (In %)	-0.06	-0.61	0.5488
ROA (In %)	47.76	2.28	0.0286
NET worth per share (In NPR)	0.19	0.76	0.4521
Paid up capital In NPR Billion	4.30	1.24	0.2230
Loan Mobilization in NPR Billion	-0.99	-1.44	0.1573
NPL (%)	-12.98	-2.23	0.0321
Number of Branches (Market Coverage)	0.16	1.49	0.0145
Firm age (In Years)	-0.28	-0.57	0.5689
Growth (In %)	1.26	1.00	0.3223
Total Assets in NPR Billion. (Firm Size)	0.84	1.86	0.0711

In the above table- 4.7.3, the value of the EPS coefficient is -2.58 with the p-value of 0.0606, which is slightly above 0.05, so it's a weakly significant independent variable. The P/E ratio has a coefficient of 2.55 with a 0.012 p-value, which is lower than 0.05, so the P/E ratio has a positive significant relation with return/risk. ROE coefficient is -0.06 and the P- value is greater than 0.05, so it's insignificant to return. ROA has a

coefficient of 47.76 with a P-Value of 0.0286, which is lower than 0.05, so the relation is positively significant. Net worth per share has a coefficient of 0.19 with a p-value greater than 0.76, so the relationship is insignificant. Bank capital, loan, and firm age growth rate has a coefficient of 4.30, -0.99, -0.28, and 1.26 respectively with a P-value higher than 0.05, so they have insignificant effects on Risk/return. But NPL, market coverage with branches, and firm size have coefficients of -12.98, 0.16 and 0.84 respectively with a P-value of less than or around 5%, so they have a significant effect on bank's return and risk.

The study found most of the variables have very strong F-statistic significant positive and negative relationship between dependent and independent variables.

$\hat{y} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \dots + \beta_n X_n + e$ , where  $\hat{y}$  is the prediction of risk/return as dependent variables,  $\beta_0$  is the constant,  $\beta_1, \beta_2, \dots, \beta_n$  is the coefficient of variables.  $X_1, X_2, \dots, X_n$  are the variables and "e" is the probable errors.

Replacing the equation by value and variables,

After substituting the value, We get,

**Return/Risk of stock** = - 154.20 -2.58EPS+2.55P/E ratio-0.06ROE+47.76ROA+0.19 Net Worth+4.30 Capital-0.99Loan Mobilization- 12.98 NPL+0.16Market Coverage- 0.28 firm age+1.26 Growth rate +0.84Firm Size+ Errors.

Based on the above equation and coefficient, test statistic value, and P-Value, studies found the following findings.

1. EPS has a negative weak significant effect on return. Changes in EPS bring negative changes in the return. Coefficient of -2.58, at a 5% level of significant weak significant effect on return with a p-value of 0.0606.

2. The P/E ratio has a coefficient of 2.55 with a 0.012 p-value, which is lower than 0.05, so the P/E ratio has a positive significant relation with return/risk. This means that increase in the P/E ratio will increase the return/risk.
3. ROE coefficient is -0.06 and the P- value is greater than 0.05, so it's insignificant to return at the 95% level confidence. When ROE increases return/risk decreases.
4. ROA has a coefficient of 47.76 with a P-Value of 0.0286, which is lower than 0.05, so the relation is positively significant. Return on assets has a direct positive relation with return/risk as a result when ROA increases Risk/return also increases.
5. Net worth per share has a coefficient of 0.19 with a p-value greater than 0.76, so the relation is positive but insignificant. When Net worth increases return risk also increases at a 5% level of significance.
6. Changes in Bank capital with a coefficient of 4.30 indicate positive relation but this relation is insignificant with a P-value of 0.4521. so, changes in the capital will not bring a significant increase in the risk-return.
7. Loan has a coefficient of -0.99 with a P-value of 0.1573, which indicates that there is a negative relationship between the loan and return. But the relation is found to be insignificant at a 5% level of significance.
8. Firm age has a coefficient of -0.28 with a P-value of 0.5689, which shows the negative relation of firm age with risk and return. When a firm becomes older, its profit decreases and so is a risk. And the firm takes time to make a decision and adapt to change.
9. growth rate has a coefficient of 1.26 with a P-value of 0.3223. It states that when there is an increase in growth rate, the return will increase along with risk but the relation is insignificant at a 5% level of significance.
10. NPL has a coefficient of -12.98 with a P-value of 0.0321, when non-performing loan increase profit decrease and risk increase and it have a significant effect on the bank's return and risk.
11. Market coverage with branches has a coefficient of 0.16 with a P-value of 0.0144, so they have a significant positive effect on a bank's return and risk. When there is a larger market coverage profit increases along with expenditure and other issues, which is a risk.

12. Firm size has a coefficient of 0.84 with a P-value of 0.0711 so they have a positive relationship with return/risk, but the effect is very weak and significant at a 5% level of significance.

**Table 4.7.4 Hypothesis test**

Hypothesis	Accept/reject (Relation Test)	Significance Test
H1: Earning price per share has a positive significant relation with price & returns.	Rejected	Weak Significant
H2: P/E ratio has a Positive significant relation with returns.	Accepted	Significant
H3: ROE has a positive significant relation with MPS and returns	Rejected	Insignificant
H4: ROA has a positive significant relation with MPS and returns.	Accepted	Significant
H5: Net worth per share has a positive significant relation with MPS and returns	Accepted	Insignificant
H6: bank capital has significant negative relation with the return.	Rejected	Insignificant
H7: there is a positive relation between Loan mobilization and return/risk.	Rejected	Insignificant
H8: There is a significant negative relationship between NPL and return and positive impacts on risk	Accepted	Significant
H9: there is a positive significant relationship between firm market coverage and return.	Accepted	Significant
H10: there is a negative significant relationship between firm age and return.	Accepted	Insignificant
H11: growth rate has a positive significant relation with returns.	Accepted	Insignificant
H12: The size of the bank (Assets) has a positive significant relation with MPS and returns.	Accepted	Weak Significant



## **Chapter 5**

### **Conclusion and Recommendations**

#### **5.1 Conclusion**

This study mainly focused on the two areas of study. One is to find out the factors which influence the return of commercial bank stock in Nepal. Where, if the realized return has extremely deviated from the expected mean return is the risk for the stock. So, factors affecting the price, and earning of the stock will ultimately be the factors that affect the return and risk of the stock.

Therefore, the study focused on finding out the commercial bank's firm-specific variables and their effects on return/ risk. What relationship does each variable have on return and its significance?

The studies took data for five years from 2017 to 2021 for the analysis of ten commercial banks in Nepal. And analyzed the relationship between dependent and independent variables using multiples regression. The study also calculated return, their risk (standard deviation), the variance of return, coefficient of variation, and correlation, of each bank, whole banking sector, and Market.

It also calculated the beta of each bank and banking sector to find out their aggressiveness and defensiveness in relation to market change for making strategies for selecting a stock. Segregated between systematic and unsystematic risk from the total risk of each bank in order to find out stocks whose risk can be reduced by making portfolios.

It also calculated the required rate of each bank based on the capital assets pricing model and compare it with the expected rate of return to find out whether the banks are underpriced or overpriced.

The study found that this regression explained about 65.23 % of risk/return by the variables. And rest of the remaining percentage is explained by the other variables and forces which are not covered in the study. So, this study concludes based on my regression result summary, that the variables that the study has covered have a significant influence on return. The study found that EPS, P/E ratio, ROA, NPL, market coverage by the number of branches, and firm size have a significant effect on the return and risk of the bank. Where EPS and NPL have a negative relation with return/ risk. And P/E Ratio, ROA, Market coverage, and firm size have a positive relationship with returns. Other remaining variables such as ROE, Net worth, capital, loan mobilization, firm age, and growth rate have no significant effects on return.

The study also found that PRVU bank has the highest level of risk with a standard deviation of 62.80, which is much higher than the market standard deviation of 54.61 and banking sector standard deviation of 38.39. The highest standard deviation is followed by 58.11 for Kumari bank, NIC Asia bank with 53.87, Prime commercial bank with 52.68, and Nabil bank with 50.64. But the highest risk per unit of return is Agriculture development bank, Nabil bank, Nepal Investment bank, NMB bank, and Prime commercial bank. these five banks are regarded as the highest risky among the banks in Nepal.

The study also found that most of the commercial banks of Nepal moving in the same direction as the market, thus having a positive correlation between banks and the market. Except for Kumari bank and PRVU banks, all other 8 selected banks have a beta coefficient of less than 1 and conclude that they are defensive stocks. This means

these banks are less volatile than the market. Defensive stocks are better to diversify during a bearish market. And aggressive stocks are better when the market index is increasing as it quickly responds to upward movement and gives higher capital gain.

The study found that NABIL, GBIME, NIB, NMB, PCBL, ADBL, KBL, and NBL are found to be overpriced stocks as their realized return (expected return) is less than the required rate of return. But NIC Asia and PRVU banks are underpriced as their realized expected return is higher than the required rate of return.

The study also found that Nepal Investment bank, NMB Bank Agriculture development bank, PRVU and NIC Asia Bank has high level of unsystematic risk. So, they are good stock for portfolios where unsystematic risk can be reduced through diversification.

## **5.2 Recommendations**

Based on study findings, analysis of data, and results obtained from the calculation of various measures of calculating risk and return and regression analysis results, the final recommendations of the study are as follows.

Banks should focus on maintaining their EPS, and P/E ratio in a sustained manner as it has a significant impact on banks' risk and returns. They should focus on increasing return on assets at the same time they should also minimize the risk. The non-performing loan must be attempted to reduce as it is one of the biggest risks to the banks, loan mobilization when the loan defaults. Loans must be issued only the credit-worthy borrowers and collateral should be asked because it has a negative significant effect on return. NPL. Market coverage by the number of branches and bank size has

shown a significant effect on the return and risk of the bank, therefore it is suggested to increase.

It is highly recommended to maximize the return by investing in earning assets and reduce the risk by restrictive covenants on issued loans.

Off the balance sheet activities of the banks should be recommended to perform to increase earnings with minimum risk.

Outside liability has to be maintained in such a way that it bears the minimum cost and earns higher to cover the cost of funds, administration, and management costs and return to equity.

It is recommended to select the stock in the portfolio with uncorrelated bank stocks.

Study recommends to choose stocks with low risk per unit of return which is the coefficient of variation. As per the results, NIC Asia, PRVU, NBL GBIME, and KBL are recommended.

The study also recommends making strategies for the bull and bear market, it suggests selecting aggressive stocks during bull and defensive stocks for the bear to maximize return and minimize risk.

Finally, it recommends selecting stocks whose unsystematic risks are high in order to reduce risk through diversification by portfolio construction.

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## Appendix A.

### Establishment date for calculating Age

Name of the banks	Date of Establishment	Age as on 2021
Nabil	1984	37
GBIME	2007	14
NIBL	1986	35
NMB	1995	25
PCBL	2007	13
ADBL	1968	53
Kumari	2001	20
NBL	1937	84
PRVU bank	2014	7
NIC Asia	1994	27

### Correlation Between banks, banking sector and Market returns

	Return on Market	Banking Sector	Nabil Bank Limited	GBIME Bank	Nepal Investment Bank Limited	NMB Bank Limited	Prime Commercial Bank Limited	Agriculture Development Bank Limited	Kumari Bank Limited	Nepal Bank Limited	PRVU Bank Limited	NIC Asia Bank
Return on Market	1.00											
Banking Sector	0.98	1.00										
Nabil Bank Limit	0.99	0.99	1.00									
GBIME Bank	0.98	0.97	0.97	1.00								
Nepal Investme	0.11	0.07	0.02	0.01	1.00							
NMB Bank Limit	0.60	0.74	0.67	0.59	-0.03	1.00						
Prime Commerc	0.97	0.97	0.98	0.98	-0.13	0.61	1.00					
Agriculture Deve	0.61	0.72	0.68	0.71	-0.51	0.76	0.75	1.00				
Kumari Bank Lim	0.97	0.99	0.98	0.99	-0.04	0.68	0.99	0.77	1.00			
Nepal Bank Limi	0.92	0.94	0.92	0.98	-0.01	0.63	0.94	0.78	0.97	1.00		
PRVU Bank Limit	0.89	0.95	0.91	0.94	-0.06	0.80	0.92	0.86	0.96	0.97	1.00	
NIC Asia Bank	0.82	0.89	0.88	0.86	-0.35	0.82	0.91	0.94	0.91	0.86	0.93	1.00

### Risk Free rate of return

year	Weighted Average 91-day T. Bill rate as Risk-Free rate In Percent
2015/16	0.44
2016/17	0.55
2017/18	3.34
2018/19	4.97
2019/20	0.21
2020/21	4.55
2021/22	7.34
<b>Average</b>	<b>3.06</b>

### Standard Deviation of market, Banking sector

## and selected banks

	Naames	Value
	Market Standard Deviation	54.61
	Bank sector Standard Deviat	38.39
Standard Deviation	Nabil Bank	50.64
	GBIME Bank	45.34
	Nepal Investment Bank Limited	24.33
	NMB Bank Limited	19.96
	Prime Commercial Bank Limited	52.68
	Agriculture Development Bank Limited	36.02
	Kumari Bank Limited	58.11
	Nepal Bank Limited	47.60
	PRVU Bank Limited	62.80
	NIC Asia Bank	53.87

## Summary of Return of Banks

	Years	Return	Dividend
Nabil	2017	-30.59	48.00
	2018	-41.52	34.00
	2019	-5.89	34.00
	2020	1.51	35.26
	2021	87.09	38.00
GBIME Bank	2017	-20.65	20.00
	2018	-22.28	16.00
	2019	10.14	25.50
	2020	-8.81	16.00
	2021	86.76	13.50
Nepal Investment Bank	2017	42.11	40.00
	2018	-23.57	40.00
	2019	53.80	19.00
	2020	32.34	18.50
	2021	34.87	16.00
NMB Bank	2017	-6.00	15.79
	2018	-29.76	30.00
	2019	16.81	35.00
	2020	12.36	16.20
	2021	15.93	15.80
PCBL Bank	2017	-41.79	27.00
	2018	-28.34	16.00
	2019	3.45	16.00
	2020	-0.35	15.00
	2021	93.15	16.63
ADBL Bank	2017	-44.54	21.05
	2018	-24.82	21.05
	2019	39.37	30.00
	2020	1.66	15.79
	2021	32.26	21.05
Kumari Bank	2017	-33.5	12.75
	2018	-38.4	8.50
	2019	16.4	10.53
	2020	-5.0	14.00
	2021	105.0	8.67
NBL Bank	2017	-21.0	0.00
	2018	-25.3	0.00
	2019	27.6	25.00
	2020	-18.8	16.00
	2021	85.6	17.00
PRVU Bank	2017	-29.1	0.00
	2018	-51.8	0.00
	2019	49.5	25.00
	2020	-3.8	16.00
	2021	103.5	17.00
NIC ASIA Bank	2017	-41.9	0.00
	2018	-28.7	0.00
	2019	48.4	25.00
	2020	31.7	16.00
	2021	86.8	17.00

## Calculation of Return and Risk

Nabil Bank					
Year	Dividend In %	Closing Price mid July	HPR=( P1-P0+Dividend)/(P1) in %	[RA-E(RA)]^2	
2016		2370			
2017	48	1597	-30.59	1070.01	
2018	34	900	-41.52	1904.07	
2019	34	813	-5.89	64.15	
2020	35.26	790	1.51	0.37	
2021	38	1440	87.09	7219.61	
<b>Total</b>			<b>10.60</b>	<b>10258.22</b>	
<b>Mean Return</b>			<b>2.12</b>	<b>2564.55</b>	
Standard Deviation				50.64	
Coefficient of Variation				23.88	

ADBL Bank					
Year	Dividend In %	Closing Price mid July	HPR=( P1-P0+Dividend)/(P1) in %	[RA-E(RA)]^2	
2016		844			
2017	21.05	447	-44.54	2054.66	
2018	21.05	315	-24.82	655.65	
2019	30	409	39.37	1488.46	
2020	15.79	400	1.66	0.77	
2021	21.05	508	32.26	990.86	
<b>Total</b>			<b>3.92</b>	<b>5190.39</b>	
<b>Mean Return</b>			<b>0.78</b>	<b>1297.60</b>	
Standard Deviation				36.02	
Coefficient of Variation				45.91	

GBIME Bank					
Year	Dividend In %	Closing Price mid July	HPR=( P1-P0+Dividend)/(P1) in %	[RA-E(RA)]^2	
2016		523			
2017	20	395	-20.65	880.96	
2018	16	291	-22.28	980.27	
2019	25.5	295	10.14	1.22	
2020	16	253	-8.81	318.42	
2021	13.5	459	86.76	6041.65	
<b>Total</b>			<b>45.15</b>	<b>8222.53</b>	
<b>Mean Return</b>			<b>9.03</b>	<b>2055.63</b>	
Standard Deviation				45.34	
Coefficient of Variation				5.02	

NIC Aisa					
Year	Dividend In %	Closing Price mid July	HPR=( P1-P0+Dividend)/(P1) in %	[RA-E(RA)]^2	
2016		824			
2017	21.05	458	-41.863	3738.55	
2018	10.53	316	-28.705	2302.66	
2019	21.05	448	48.434	849.88	
2020	20	570	31.696	154.15	
2021	0	1065	86.842	4564.53	
<b>Total</b>			<b>96.404</b>	<b>11609.77</b>	
<b>Mean Return</b>			<b>19.281</b>	<b>2902.44</b>	
Standard Deviation				53.87	
Coefficient of Variation				2.79	

Nepal Investment Bank					
Year	Dividend In %	Closing Price mid July	HPR=( P1-P0+Dividend)/(P1) in %	[RA-E(RA)]^2	
2016		577			
2017	40	780	42.11	1609.39	
2018	40	623	-15.00	288.91	
2019	19	520	-13.48	239.64	
2020	18.5	440	-11.83	191.11	
2021	16	460	8.18	38.25	
<b>Total</b>			<b>9.99</b>	<b>2367.29</b>	
<b>Mean Return</b>			<b>2.00</b>	<b>591.82</b>	
Standard Deviation				24.33	
Coefficient of Variation				12.18	

Kumari Bank					
Year	Dividend In %	Closing Price mid July	HPR=( P1-P0+Dividend)/(P1) in %	[RA-E(RA)]^2	
2016		523			
2017	12.75	335	-33.51	1798.85	
2018	8.5	198	-38.36	2233.74	
2019	10.53	220	16.43	56.63	
2020	14	195	-5.00	193.33	
2021	8.67	391	104.96	9226.50	
<b>Total</b>			<b>44.52</b>	<b>13509.05</b>	
<b>Mean Return</b>			<b>8.90</b>	<b>3377.26</b>	
Standard Deviation				58.11	
Coefficient of Variation				6.53	

NMB Bank					
Year	Dividend In %	Closing Price mid July	HPR=( P1-P0+Dividend)/(P1) in %	[RA-E(RA)]^2	
2016		603			
2017	15.79	551	-6.00	61.94	
2018	30	357	-29.76	1580.08	
2019	35	382	16.81	46.52	
2020	16.2	413	12.36	5.62	
2021	15.8	463	15.93	35.36	
<b>Total</b>			<b>9.33</b>	<b>1729.51</b>	
<b>Mean Return</b>			<b>1.87</b>	<b>432.38</b>	
Standard Deviation				20.79	
Coefficient of Variation				11.15	

NBL Bank					
Year	Dividend In %	Closing Price mid July	HPR=( P1-P0+Dividend)/(P1) in %	[RA-E(RA)]^2	
2016		480			
2017	0	379	-21.04	939.44	
2018	0	283	-25.33	1220.70	
2019	25	336	27.56	322.32	
2020	16	257	-18.75	804.22	
2021	17	460	85.60	5775.15	
<b>Total</b>			<b>48.04</b>	<b>9061.83</b>	
<b>Mean Return</b>			<b>9.61</b>	<b>2265.46</b>	
Standard Deviation				47.60	
Coefficient of Variation				4.95	

PCBL					
Year	Dividend In %	Closing Price mid July	HPR=( P1-P0+Dividend)/(P1) in %	[RA-E(RA)]^2	
2016		780			
2017	27	427	-41.79	2210.58	
2018	16	290	-28.34	1126.22	
2019	16	284	3.45	3.15	
2020	15	268	-0.35	31.07	
2021	16.63	501	93.15	7730.56	
<b>Total</b>			<b>26.11</b>	<b>11101.57</b>	
<b>Mean Return</b>			<b>5.22</b>	<b>2775.39</b>	
Standard Deviation				52.68	
Coefficient of Variation				10.09	

Prvu Bank					
Year	Dividend In %	Closing Price mid July	HPR=( P1-P0+Dividend)/(P1) in %	[RA-E(RA)]^2	
2016		578			
2017	0	410	-29.07	1825.76	
2018	12.63	185	-51.80	4285.11	
2019	10.53	266	49.48	1282.54	
2020	16.84	239	-3.82	305.65	
2021	8.42	478	103.52	8074.79	
<b>Total</b>			<b>68.32</b>	<b>15773.84</b>	
<b>Mean Return</b>			<b>13.66</b>	<b>3943.46</b>	
Standard Deviation				62.80	
Coefficient of Variation				4.60	

NEPSE					
Year		Closing Price mid July	HPR=( P1-P0+Dividend)/(P1) in %	[RA-E(RA)]^2	
2016		1747			
2017		1604	-8.19	749.32	
2018		1204	-24.94	1947.09	
2019		1259	4.57	213.75	
2020		1394	10.72	71.66	
2021		2980	113.77	8946.34	
<b>Total</b>			<b>95.94</b>	<b>11928.16</b>	
<b>Mean Return</b>			<b>19.19</b>	<b>2982.04</b>	
Standard Deviation				54.61	
Coefficient of Variation				2.85	

Banking Sector					
Year		Closing Price mid July	HPR=( P1-P0+Dividend)/(P1) in %	[RA-E(RA)]^2	
2016		1623			
2017		1443	-11.09	431.21	
2018		1019	-29.38	1525.56	
2019		1133	11.19	2.29	
2020		1194	5.38	18.41	
2021		2057	72.28	3919.13	
<b>Total</b>			<b>48.38</b>	<b>5896.60</b>	
<b>Mean Return</b>			<b>9.68</b>	<b>1474.15</b>	
Standard Deviation				38.39	
Coefficient of Variation				3.97	