

**RISK AND RETURN ANALYSIS OF SELECTED  
COMMERCIAL BANKS IN NEPAL**

**Submitted by**

**Ram Kumar Kurmi**

**Central Department of Management**

**Campus Roll No.: 479/065-67**

**Symbol No.: 280511/068**

**T.U. Reg. No.: 7-1-304-81-2002**

**Submitted to**

**Office of the Dean**

**Faculty of Management**

**Tribhuvan University**

**Kirtipur, Kathmandu**

**In partial fulfillment of the requirement for the degree of  
Master of Business Studies**

**Kathmandu, Nepal**

**December, 2013**

***RECOMMENDATION***

This is to certify that the thesis

*Submitted by:*

**Ram Kumar Kurmi**

Entitled

**RISK AND RETURN ANALYSIS OF SELECTED COMMERCIAL  
BANKS IN NEPAL**

has been prepared as approved by this Department in the prescribed format  
of Faculty of Management. This thesis is forwarded for examination.

-----  
Prof. Dr. Upendra Kumar Koirala  
(Thesis Supervisor)

-----  
Prof. Dr. Sunity Shrestha  
(Chairperson, Research Committee)

-----  
Prof. Dr. Bal Krishna Shrestha  
(Head of the Department)

Date: .....

**VIVA-VOCE SHEET**

We have conducted the viva-voce examination of the thesis presented by

**Ram Kumar Kurmi**

Entitled

**RISK AND RETURN ANALYSIS OF SELECTED COMMERCIAL  
BANKS IN NEPAL**

and found the thesis to be the original work of the student written according to the prescribed format. We recommend the thesis to be accepted as partial fulfillment for

**Master's Degree in Business Studies (M.B.S.)**

**Viva-Voce Committee**

Chairperson, Research Committee -----

Member (Thesis Supervisor) -----

Member (External Expert) -----

Member (Central Department of Management) -----

Date: -----

## DECLARATION

I hereby, declare that the work reported in this thesis entitled “**Risk and Return Analysis of Selected Commercial Banks in Nepal**” submitted to Central Department of Management, University Campus, T.U., Kirtipur is my original piece of work done in the form of partial fulfillment of the requirement for the Master’s Degree in Business studies under the supervision and guidance of Prof. Dr. Upendra Kumar Koirala, Central Department of Management.

.....

Ram Kumar Kurmi

Roll No.: 479/065

Central Department of Management

## **ACKNOWLEDGEMENTS**

This study is mainly concern with the analysis of “Risk and Return Analysis of Selected Commercial Banks in Nepal.” During the course of my study, I found myself fortunate enough to receive a good deal to help and inspiration from various persons and institution. So I would like to express my sincere thanks to all of them.

I would like to express my sincere gratitude to my respected teacher Dr. Upendra Kumar Koirala, Professor, Central Department of Management, T.U., for his valuable guidance and supervision to my study.

I am thankful to my friends Deepak Bhusal and Rakesh Kumar Chaudhary for their kind support during thesis writing.

I am heartly thankful to all the staffs of concerned banks who have provided me with required materials to complete the research study.

I am thankful to my friends who directly or indirectly supported me during my research. I am equally thankful to all the teachers and staffs of Central Department of Management, T.U., Kirtipur for their help and kind cooperation.

Ram Kumar Kurmi

December, 2013

## TABLE OF CONTENTS

|   | <b>Page No.</b> |
|---|-----------------|
| Recommendation                              | i               |
| Viva-Voce Sheet                             | ii              |
| Declaration                                 | iii             |
| Acknowledgements                            | iv              |
| Table of Contents                           | v               |
| List of Tables                              | viii            |
| List of Figures                             | ix              |
| Abbreviations                               | x               |
| <br>  |                 |
| <b>CHAPTER-I: INTRODUCTION</b>              | <b>1</b>        |
| 1.1 General Background                      | 12              |
| 1.2 Focus of the Study                      | 18              |
| 1.3 Statement of the Problem                | 19              |
| 1.4 Objectives of the Study                 | 21              |
| 1.5 Significance of the Study               | 21              |
| 1.6 Limitation of the Study                 | 22              |
| 1.7 Organization of the Study               | 22              |
| <b>CHAPTER-II: REVIEW OF LITERATURE</b>     | <b>13</b>       |
| 2.1 Conceptual Review                       | 24              |
| 2.1.1 Investment                            | 24              |
| 2.1.2 Common Stock                          | 25              |
| 2.1.3 The Return of Common Stock            | 26              |
| 2.1.4 The Risk on Common Stock              | 28              |
| 2.1.4.1 Risk                                | 28              |
| 2.1.4.2 The Risk on Common Stock            | 33              |
| 2.1.5 Relationship between Risk and Return  | 34              |
| 2.1.6 Portfolio                             | 35              |
| 2.1.7 Systematic Risk and Unsystematic Risk | 41              |

|   |           |
|---|-----------|
| 2.1.8 Capital Asset Pricing Model (CAPM)              | 43        |
| 2.2 Reviews from Journals                             | 46        |
| 2.3 Review of Other Independence Studies in Nepal     | 50        |
| 2.4 Reviews from Thesis                               | 54        |
| 2.5 Research Gap                                      | 60        |
| <b>CHAPTER-III: RESEARCH METHODOLOGY</b>              | <b>50</b> |
| 3.1 Introduction                                      | 61        |
| 3.2 Research Design                                   | 61        |
| 3.3 Sources of Data                                   | 62        |
| 3.4 Population and Sample                             | 62        |
| 3.5 Factors and Methods of Analysis                   | 62        |
| 3.5.1 Factors of Data Analysis                        | 63        |
| 3.5.1.1 Market Price of Shares (MPS)                  | 63        |
| 3.5.1.2 Dividend per Share (DPS)                      | 63        |
| 3.5.2 Tools of Analysis                               | 64        |
| 3.5.2.1 Financial Tools                               | 64        |
| 3.5.2.2 Statistical Tools                             | 67        |
| 3.6 Methods of Analysis and Presentation              | 71        |
| <b>CHAPTER IV: DATA ANALYSIS AND MAJOR FINDINGS</b>   | <b>61</b> |
| 4.1 Data Presentation and Analysis                    | 72        |
| 4.1.1 Analysis of Individual Commercial Banks         | 72        |
| 4.1.1.1 Standard Chartered Bank Nepal Limited (SCBNL) | 73        |
| 4.1.1.2 Nepal Arab Bank Ltd. (NABIL)                  | 75        |
| 4.1.1.3 Bank of Kathmandu (BOKL)                      | 77        |
| 4.1.1.4 Himalayan Bank Limited (HBL)                  | 79        |
| 4.1.1.5 Nepal SBI Bank Ltd.                           | 81        |
| 4.1.1.6 Nepal Investment Bank Ltd. (NIBL)             | 83        |
| 4.2 Comparative Analysis of Obtained Results          | 85        |
| 4.2.1 Inter Bank Comparisons                          | 85        |

|   |            |
|---|------------|
| 4.2.2 Comparison of Selected Commercial Banks on the Basis of Market Capitalization | 87         |
| 4.2.3 Analysis of Market Risk and Return  | 88         |
| 4.3 Comparison of Sample banks with Market  | 90         |
| 4.3.1 Standard Chartered Bank Nepal Limited (SCBNL)                                 | 90         |
| 4.3.2 NABIL Bank Limited  | 91         |
| 4.3.3 Bank of Kathmandu Limited (BOKL)  | 93         |
| 4.3.4 Himalayan Bank Limited (HBL)  | 94         |
| 4.3.5 Nepal SBI Bank Ltd  | 96         |
| 4.3.6 Nepal Investment Bank Ltd. (NIBL)   | 97         |
| 4.4 Price Evaluation of Selected Banks  | 99         |
| 4.5 Portfolio Analysis  | 100        |
| 4.6 Analysis of Average/Pooled Six Simple Commercial banks                          | 101        |
| 4.7 Portfolio Analysis is Each Two Assets among Selected Assets                     | 102        |
| 4.8 Major Findings  | 103        |
| <b>CHAPTER-V: SUMMARY, CONCLUSIONS AND RECOMMENDATION</b>                           | <b>95</b>  |
| 5.1 Summary   | 106        |
| 5.2 Conclusion  | 107        |
| 5.3 Recommendations   | 109        |
| <b>BIBLIOGRAPHY</b>   | <b>112</b> |
| <b>APPENDICES</b>   | <b>104</b> |

## LIST OF TABLES

|  | <b>Page No.</b> |
|--|-----------------|
| Table 4.1: MPS and DPS of Common Stocks of SCBNL   | 73              |
| Table 4.2: Statistical Analysis is of Common Stock of SCBNL  | 74              |
| Table 4.3: MPS and DPS of Common Stocks of NABIL   | 75              |
| Table 4.4: Statistical Analysis of Common Stock of NABIL   | 76              |
| Table 4.5: MPS and DPS of Common Stocks of BOKL  | 77              |
| Table 4.6: Statistical Analysis of Common Stock of BOKL  | 78              |
| Table 4.7: MPS and DPS of Common Stocks of HBL   | 79              |
| Table 4.8: Statistical Analysis of Common Stock of HBL   | 80              |
| Table 4.9: MPS and DPS of Common Stocks of Nepal SBI Bank  | 81              |
| Table 4.10: Statistical Analysis of Common Stock of Nepal SBI Bank   | 83              |
| Table 4.11: MPS and DPS of Common Stocks of NABIL  | 84              |
| Table 4.12: Statistical Analysis of Common Stock of NIBL   | 85              |
| Table 4.13: Expected Return, S.D. and Coefficient of Variation of each Bank  | 86              |
| Table 4.14: Market Capitalization of Selected Banks  | 87              |
| Table 4.15: Realized Return, Expected Return, Standard Deviation and<br>Coefficient of Variation of Market Index                               | 89              |
| Table 4.16: Summary of Risk and Return for SCBNL and Market  | 90              |
| Table 4.17: Summary of Risk and Return for NABIL and Market  | 91              |
| Table 4.18: Summary of Risk and Return of BOKL and Market  | 93              |
| Table 4.19: Summary of Risk and Return of HBL and Market   | 94              |
| Table 4.20: Summary of Risk and Return for Nepal SBI Bank Ltd. and Market  | 96              |
| Table 4.21: Summary of Risk and Return for NIBL and Market   | 97              |
| Table 4.22: Summary of Risk and Return for Sample  | 99              |
| Table 4.23: Calculation of Required Rate of Return (RRR), Expected Rate of<br>Return (ERR) and Price Evaluation of each Stock by CAPM<br>Model | 100             |
| Table 4.24: Average Return of Six Commercial banks   | 101             |
| Table 4.25: Statistical Analysis of Common Stock of Six Commercial Banks   | 102             |
| Table 4.28: Portfolio Return & Risk in each Two Assets   | 103             |

## LIST OF FIGURES

|  | <b>Page No.</b> |
|--|-----------------|
| Figure 2.1: A security Characteristic Line   | 39              |
| Figure 2.2: Portion of Risk on a Portfolio   | 42              |
| Figure 2.3: The Security Market Line (SML)   | 45              |
| Diagram 4.1: Year End Market Price Movement of the Common Stock of<br>SCBNL          | 74              |
| Diagram 4.2: Year End Market Price Movement of the Common Stock of<br>NABIL          | 76              |
| Diagram 4.3: Year End Market Price Movement of the Common Stock of<br>BOKL           | 78              |
| Diagram 4.4: Year End Market Price Movement of the Common Stock of HBL               | 80              |
| Diagram 4.5: Year End Market Price Movement of the Common Stock of<br>Nepal SBI Bank | 82              |
| Diagram 4.6: Year End Market Price Movement of the Common Stock of<br>NIBL           | 84              |
| Diagram 4.7: Year End Market Price Movement of the Common Stock of<br>NIBL           | 87              |
| Figure 4.8: Market Capitalization of Selected Banks                                  | 88              |

## ABBREVIATIONS

|           |   |                              |
|-----------|---|------------------------------|
| AGM       | = | Annual General Meeting       |
| CAPM      | = | Capital Assets Pricing Model |
| CS        | = | Common Stock                 |
| CV        | = | Coefficient of Variation     |
| DPS       | = | Dividend per Share           |
| EBL       | = | Everest Bank Limited         |
| EMH       | = | Efficient Market Hypothesis  |
| EPS       | = | Earning per Share            |
| FY        | = | Fiscal Year                  |
| HBL       | = | Himalayan Bank Limited       |
| HPR       | = | Holding Period Return        |
| JV        | = | Joint Venture                |
| MPS       | = | Market Price of Share        |
| NB Bank   | = | Nepal Bangladesh Bank        |
| NBL       | = | Nepal Bank Limited           |
| NEPSE     | = | Nepal Stock Exchange         |
| NRB       | = | Nepal Rastra Bank            |
| SBI Nepal | = | State Bank of India Nepal    |
| SD        | = | Standard Deviation           |
| SML       | = | Security Market Line         |
| SR        | = | Systematic Risk              |
| TU        | = | Tribhuwan University         |
| USR       | = | Unsystematic Risk            |

# CHAPTER-I

## INTRODUCTION

### 1.1 General Background

The stock, which is issued to get dividend in remaining portion of profit after paying to debentures, bonds, preferred stock is called ordinary shares/common shares. The ordinary shareholders are the equity holders and are the real owners of the business. Common stockholders are the equity holders and are the ultimate owners of the business. As they collectively own then, they share all the profits and bear all the losses of business. So the common stock is risky security. Investor invests in common stock for higher return. But their expected return may or may not change in realities. This uncertainty is major risk to investors in stock market investment.

Return is reward obtained in future for risking the investment at present. It involves both capital gain or losses and dividend received from investment. The capital gain or loss is the changes in market price of investment and dividend is the regular income of investment in share. Both market price of share and dividend are uncertain figures. So, the actual figure of return on investment in common stock may differ substantially from the expected return and, therefore it is said, return is reward for uncertainty. The greater variability, the riskier the security is said to be. The market price of share of a company is driven both by fundamental business values and stock market sentiment. For a given business, it is always worth attempting to identify which of those is driving its share price.

Risk is present in every alternative investment. Uncertainty in return from investment is called risk. Always investment is process with full of risk and return possibilities. Generally, investors are risk averse. They always seek to minimize risk for same level of return and to maximize return at the same level of risk. And, they always seek higher return for more risk as risk premium. So

the primary problem of investment is to identify the security, which has low risk and high return. Although, return cannot be increased substantially, risk can be reduced by diversification can eliminate the unsystematic risk, which is not explained by general market movement. Systematic risk, which is associated with change in return on the market as a whole, cannot be avoided by the diversification.

In Nepal, the institutional set up of securities market began along with the securities exchange center (now Nepal Stock Exchange Ltd.) in 1976 A.D. In spite of considerable development there are still more potentialities to be explored for the development of stock market in Nepal. Most of the potential investors and the shareholder public themselves are unknown or least understood about risk-return behavior of stock. Most of the Nepalese investors are finding to visit in single security due to lack of information and poor knowledge, market intermediates exploit investors. So, many investors are afraid to invest in stocks. People participation in securities investment and its dynamic trading plays a vital role in overall economic development. For this propose potential investors must be able to analyze risk and return of individual stock and portfolio as well. This will increase their confidence and ultimately increase stock investment and increase the degree of market efficiency, which is essential to spreading economic development of the nation.

Fund used to get additional income is called investment. It is done to increase the value of property or to get extra income. The essential of doing investment is to wait time to get something return from it. In this sense, investment is using fund at present to get additional return in future. Investment takes place either two conditions of peoples: one, when current income exceeds current consumption desires, people tends to invest the surplus amount and, next, when they sacrifice current consumptions for future, expecting to get more than sacrificed before. The sacrifice takes place in the present and is certain. But the reward comes later and is an uncertain. Return is the primary motive of investment, but it always entails some degree of risk. Buying common stocks,

bonds, deposited money into bank account, buying a piece of land, gold or silver are some example of investment. All these examples involve sacrifice of current rupees in expectation of future return. Hence, they are investment. The main objective of investment is to maximize the wealth of an investor.

Investment can be made on real assets or financial asset. Investment on real assets is known as real investment and investment on financial assets is known as financial investment. Real investment means investment on real assets like land buildings, factory etc. financial investment means on financial asset like share, debentures, warrants and convertibles etc.

The term risk and return is closely associated with investment. Investment simply means sacrificing current funds for future returns, bearing certain risk. The investment may be on real assets like land, building or precious metals and collectibles or something else. But here as a student of finance, I have focused the term investment as sacrificing current fund on financial assets like shares, debenture, warrants, convertibles etc for the long term return.

Investors invest their fund on the securities of certain companies for the long run future returns. The return is defined as the reward for bearing the risk. Return is the most important outcome from an investment. It measures the investor's rate of wealth accumulation i.e. increase or decrease per period. Risk is defined as the occurrence of unfavorable outcomes, which is ever harmful for the business. Risk is inseparable from return. It ever creates uncertainty. Some of the factors that create investment uncertainty such as interest rate risk, purchasing power risk, bull-bear market risk, management risk and so on.

Thus, risk is virtually every decision. Assessing risk and incorporating the same in the final decision is an integral part of financial analysis. The objectives in decision making are not to eliminate or valid risk often it may be neither feasible nor necessary to do so but to properly assets it and determine whether it is worth bearing.

Investor generally does not invest their money in the only on risky asset. The investor should invest their money in portfolio of many assets. It will help to the investor to minimize the risk. Therefore, an investor is concerned with the portfolio risk, which is the sum of the relevant risk of individual assets included in portfolio. The relevant risk of an asset is defined as the portion of its total risk that changes proportionately with market risk. Some stocks are riskier than other and even in years when the overall money into one stock goes down. Therefore, putting all your money into one stock is extremely risky. The single best weapon against risk is diversification.

In Nepal, the concept of financial institution was introduced when the first commercial bank, Nepal bank limited was established in 1994 B.S. It was established under special banking act 1993 B.S. having elementary function of commercial bank. Later in 2012 B.S. the central bank Nepal Rastra Bank was established with an objective of supervising, protecting and directing the function of commercial banking activities. Another commercial bank fully owned by HMG/N, names as Rastriya Banijya Bank got established in 2023 B.S. The establishment of joint venture bank gave a new horizon to the financial sector of the country. Since 1984 A.D. JV banks were established under company act and their shares were listed in Nepal stock exchange limited (NEPSE). There are 7 JV banks listed in NEPSE. The focus of the study is that JV bank whose share listed in NEPSE.

Banking sector is the most critical & dynamic part of economy, which collects unused funds and mobilizes in needed areas. It is the heart of trade, commerce & industry. In Nepalese context, commercial banks have comparatively good performance among the public limited companies. There is majority of banks with in the top ten positions, among the listed companies on the basis of amount traded, number of transaction, market capitalization etc. Most of the banks are established with collaboration of foreign well-known banks. As a public limited company, Nepal Bank Limited (NBL) is only one Nepalese commercial bank, which is listed in NEPSE. Besides this oldest bank there are

seven other joint venture banks, which are listed in NEPSE. Besides these, a government bank, Rastriya Banijya Bank, also plays a vital role in banking sector. In Nepal altogether there are 31 commercial banks.

The nature of bank's fund and its payment depends upon day to day operation. Therefore, its operation of fund raising and investment of funds are of short-term nature. As long-term investments are associated with higher risk, banks are confined to make short-term investment only. The significance of commercial banks is greater in those countries which are at comparatively lower level of economic development.

Nepal foreign joint venture banks perform better than Nepalese ones do. Because they have higher management efficiency and they can manage risk properly. Specifically, Nepalese banks have a high degree of internal firm specific risk. At the same time they have to bear more social obligation and government intervention than foreign banks. However, Nepalese bank has high potentialities to increase their performance by changing their risk attitude and by improving their internal management.

Risk is related to future and future is uncertain. But risk is manageable rather than uncertain. Company – specific risk [earning variability] and companies ability to service its debt burden are intimately related to the particular characteristics of the business in which the company operates. Moreover, they are affected by economic condition-apart management's ability to generate satisfactory operating performance.

A systematic, investment process should be followed to win the stock market. Investment process describes how an investor should go about making decision with regard to what marketable to invest in, how extensive the investment should be, and when the investment should be made. A five step procedure for making decision forms the basis of investment process.

- a. Set the Investment Policy

- b. Security Analysis
- c. Portfolio Construction
- d. Portfolio Revision
- e. Portfolio Performance Evaluation

#### **a) Set the Investment Policy**

The first step in setting an investment policy involves determining the investment objectives and the amount of one's investable wealth. Because there is a positive relationship between risk and return for sensible investment strategies, it is not appropriate for an investor to say that his/her objective is to 'make lot money'. It is appropriate to state that the objective is to make a lot of money by recognizing the possible losses. Therefore, investment objectives should be stated in terms of both risks and returns.

Setting a clear investment policy also involves the identification of the potential categories of financial assets for consideration in the ultimate portfolio. The identification of assets depends upon many things, such as investment objectives, investable wealth, tax considerations etc.

#### **b) Security Analysis**

The second step in investment process is performing security analysis. It involves examining several individual securities or groups of securities within the broad categories of financial assets previously identified. One reason to examine securities is to identify securities which are mispriced.

Many approaches can be used to analyze the securities. This approach in a broad sense can be classified into two types.

- a. Technical analysis
- b. Fundamental analysis.

### **c) Portfolio Construction**

Third step of investment process is construction of portfolio. At this stage we identify assets in which to invest and what proportion of the investor's wealth to put in each one. While constructing a portfolio, the selectivity, timing and diversification need to be addressed by investor.

### **d) Portfolio Revision**

Portfolio revision means repeating the previous three steps of the process. Over the period of time, the objectives of the investor may change and the current portfolio may no longer be optimal.

- ❖ The investor can sell some unattractive securities and introduce attractive ones to form a new optimal portfolio.
- ❖ Some securities that are initially unattractive may turn out to be attractive later and vice versa.

### **e) Portfolio Performance Evaluation**

The last step of the investment process is to evaluate the investment performance. The performance should be evaluated not only in terms of the returns but also the risks experienced. Evaluate the performance, appropriate measures and standard are needed.

## **1.2 Focus of the Study**

The changing life style has always been challenging to the business community and has given opportunity and threats to produce thousands of types of goods and services to satisfy the changing needs of people. The societal needs have increased tremendously in quantity as well as quality. All this has induced business to gear up investments in many fields. Where investments need huge amount, which can not cover by the past profiles and surplus of individual investor only. And the numbers of economic society individuals and institution

rarely have balanced budget. Some of them always earn more than what they consume and others earn less than what they consume. It can be understood that there is no equilibrium between income and expenditure because people undertake additional activities of investing requiring more funds than what they have. Investing activities of individuals largely depend upon the perceptions towards risk, return, enterprising ability, wealth and time.

Disequilibrium in income and expenditure of individual entities towards risk and return. This helps to transfer and mobilize financial resources from one unit to another unit of the society. The advent of security market has successfully served this purpose to transfer funds from one to the other.

The main focus of this study is the risk and return analysis of the common stock investment of the listed commercial banks of Nepal. Common stock is comparatively riskier assets than other securities in the capital market. The main purpose of the study is to analyze how one can get sustainable profit by minimizing the risk. For this purpose, market return, expected return, total risk, systematic risk and unsystematic risk are analyzed to give an idea to get sustainable profit by diversifying the risk to avoid future loss of the common stock investment. Among 31 commercial banks viz. SCBNL, NABIL, HBL, NIBL, BOK and Nepal SBI Bank Ltd. are selected as sample.

### **1.3 Statement of the Problem**

Investment is a decisional process. In this process an investor tries to get an answer of choosing best investment alternatives. How much money invests? When it should be invested? Etc. Investors should make rational investment decision. For this purpose, knowledge for analysis of common stock is essential. Investor's attitude and perceptions are also considerable for rational investment decision. Many investors are manipulated and exploited by the financial institution and other market intermediaries since they are unknown about norms of security market. Not only general public but also the university

graduates and post graduates cannot analyze risk and return while making stock investment decision.

In the context of Nepal, investors are also facing the problems of lack of the institutions to provide adequate information about the investment options.

After the emergence of NEPSE in 1993 AD, these type of problem somehow has been solved, but another problem to the Nepalese people is they feel more risk in stock investment than as its real risk, it keeps them in dilemma, whether they should invest in stock or not and this all conditions makes them to not utilize their funds as a result investors are not benefited nor the national economy as well.

Further, theory says that the stock price in market is guided by the intrinsic value which is calculated by aid of company's result of financial performance such as dividend, required rate of return and growth. In the efficient market condition stock price is equal to the intrinsic value since the buyer and the seller are fully aware of the facts and figures of the company. Therefore one can say that market price and financial performance are correlated but condition here is totally different from that. Courage and faith are intermediate factor to invest in common stock because there are several questions, which may be arising in the mind of the individual investors at the time of the investment.

More specifically the research problems are:

- How can one make higher return through lower risk?
- How do they know about the magnitude of risk?
- How can investor diversify the risk?
- What are the criteria for evaluation that the common stock they are holding will give them favorable return?

#### **1.4 Objectives of the Study**

Based on the ground of aforementioned problems being faced by Nepalese investors, the main objectives of this study is to assess the risk associated with return on common stock investment of the listed commercial banks on the basis of selective financial tools and techniques. Some objectives of this study are as follows:

- To make common stock investors able to evaluate risk, return and other relevant variables that directly affect the investment in common stock.
- To analyze the correlation among the returns of commercial banks.
- To determine whether stock of listed commercial banks in Nepal in terms of overpriced, under priced or equilibrium by analyzing the risk and return of the individual share.
- To analyze comparative risk and return position of these sectors.
- To give suggestion, ideas and materialize recommendations for investors to analysis of data.

#### **1.5 Significance of the Study**

The study, analyzing risk and return, will provide some crucial information about Nepalese capital market. It will definitely contribute to increase the analytical power of the investors in capital market. The study will be beneficial for all the persons who are directly or indirectly related to the Nepalese capital market. This research has attempted to analyze the market shares of sample companies with references to their financial indicators and risk in common stock investment, which may probably provide real pictures of samples companies, to both the outstanding and potential investors in order to take proper investment decision. Similarly, this piece of task may work as guide for future research and concerned persons.

Further this research will attempt to clarify concrete picture of different aspects of risk and return which will be beneficial to the investor for taking right investment decision. The study will be maximum significant for exploring and

increasing stock investment. It will also provide little contribution to Nepalese stock market development.

This study is not only to fulfill MBS level course of T.U., but also to provide some knowledge about the Nepalese stock market along with providing ideas to minimize the risk on stock investment.

From the viewpoint of investors, the analysis of risk and return is significant management decisions which influence the shareholder risk and return. Consequently, the risk and return analysis influences the market price of stock, by making it at an appropriate level. Apart from this study will be a matter of interest for academicians, students, researchers, teachers or persons, practicing in the field of finance.

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

The study is to fulfill the requirement of Master Degree in Business Studies. It cannot cover all the dimension of the subject matter and resource. The major limitations of the study are as follows:

- Risk and return of common stock of only SCBNL, NABIL, HBL, NIBL, BOK and Nepal SBI Bank is analyzed.
- The accuracy of data depends upon the data collected and provided by the organization. Only secondary data is collected.
- Data from part time frame i.e. later six years (2004/05 to 2010/11) have been used.
- The research will be concerned with certain listed commercial banks only.
- Time and financial constraints are also major limitation of the study.

### **1.7 Organization of the Study**

This study is organized into five chapters:

Chapter - I: This is introduction chapter. This chapter consists of general background, statement of problems, objective of the study, significance of the study, focus of study, limitation of the study and organization of the study.

Chapter - II: This chapter deals with the received of literature, which consists of conceptual framework and review of relevant studies.

Chapter - III: Third chapter is concerned with the research methodology used in this study. It consists of research design, sources of data, population and sample and method of analysis.

Chapter - IV: This chapter contains presentation and analysis of data.

Chapter - V: The fifth chapter is associated with the summary, conclusion and recommendations.

The bibliography and appendix have in corporate at the end of study.

## **CHAPTER-II**

### **REVIEW OF LITERATURE**

With a selected topic and a good idea of the problem, the next step is to read what has been written concerning his/her topic. A literature review is the process of locating, obtaining, reading, and evaluating the research literature in the area of the researcher interest. The purpose is to develop some expertise in ones area to see what new contributions can be made, and to receive some idea for developing a research design.

Review of literature includes the following topics:

- 2.1 Conceptual review
- 2.2 Reviews from Journals
- 2.3 Review of Other Independence Studies in Nepal
- 2.4 Review from thesis

#### **2.1 Conceptual Review**

Various books relating to theoretical aspect of risk and return are taken into consideration.

##### **2.1.1 Investment**

Generally, to pay out money to get more is called investment, but in the broadest sense, investment a present commitment for the future benefits. While the commitment takes place with certainty, the future benefits are shrouded in uncertainty. The uncertainty creates risk to investors and they desire to minimize return by minimizing such risk.

Therefore, taking decision about proper investment is crucial to the investor and it requires a specific investment decision process, analysis of securities, identification of overpriced, under priced securities, making appropriate investment strategies as well as construction of efficient portfolio.

Investment is concerned with the management of an investor's wealth, which are the sum of current income and the present value of all future income. The term investment is conceptualized as income, saving or other collected fund. It covers wide range of activities. It is a commonly known fact that an investment is possible only when there are adequate saving. Therefore both saving and investment are interrelated.

Investment is an exchange of financial claim stocks and bonds etc. investment is the employment of funds with the aim of achieving additional income or growth in value it involves the commitment of resources that have been saved or put away from current consumption in the hope that some benefit will occur in future. Investment involves long term commitment and waiting for a reward.

"Investment is a commitment of funds made in the expectation of some positive rate or return. If the investment is properly undertaken the return will be commensurate with the risk the investor assumes". Return risk and time are the elements of investment (Bhalla, 2001: 450).

### **2.1.2 Common Stock**

"The study is focused on the common stock investment that's why light is thrown on it. It is a source of long term financing and an ownership security. Common stock certificates are legal documents that evidence ownership or equality in a company that is organized as a corporation, and they are also marketable financial instruments.

Common stock is recipient of the residual income of the corporation. Through the right to vote, holders of common stock have legal control of the corporation. An element of high risk is involved with common stock investment due to its low priority of claims at liquidation. When investors buy common stock they receive certificate of ownership as a proof to their being part of the company. The certificate states the number of shares purchased and their value per share" (Bhalla, 1997:196).

"Common stock holders of a corporation are its residual owners, their claim to income and asset comes after creditors and preference share holders have been paid in full. As a result, a stockholders return on investment is less certain than the return to lender or to preference stock holder. On the other hand, the share of the common stock can be authorized either with or without per value. The par value of the stock is merely a stated figure in the corporate character and is of little economic significance. A company should not issue stock at a price less than par value because stock holders who bought stock for less than par value would be liable to creditors for the difference between the below price they paid and the par value". (Van Horne, 1997:98).

But in Nepal, as per the provision of Nepal Company Act 2057, no common stocks are allowed to issue without par value. The par value must be either Rs. 10 or Rs. 100. Common stock has one important investment characteristics and is important speculative characteristics. Their investment value and average market price tend to increase regularly but persistently over the decreases as their net worth builds through the reinvestment of undistributed earnings. However, most of the time common stocks are subject to irrational and excessive price fluctuation in both directions, as most people to speculate or gamble i.e. give way to hope fear and greed.

### **2.1.3 The Return of Common Stock**

Return better known or reward from an investment includes both current income and capital gain or loss that arises by the increase or decrease of the security price. Return is the income received on an investment plus any change in market price. Usually expressed as a percent of beginning price of the investment, the overall rate of return can be decomposed into two parts as capital appreciation and dividend. Capital appreciation is the difference between ending value and beginning value of an investment. Return is defined as the dividend yield plus the gain or loss. The relationship between different

levels of return on their relative frequencies is called a probability distribution. We could formulate a probability return over the previous period but we know that history never repeats itself exactly. Hence after analyzing relative frequencies of historical data plus the analysis for the outlook for the economy and the outlook for the industry, the outlook for the firm in its industry and other factors.

For investors, return is considered as the main attraction to invest in a risky security as a stock (equity) accepting a varying degree of risk tolerance. "The return from holding an investment over some period says a year is simply and cash payments received due to ownership plus the change in market price dividend by the beginning price. Thus the return comes from source, income and price appreciation.

For common stock, we can define, one period (single period) return as:

$$\text{HPR or Simple 'R'} = \frac{(P_t - P_{t-1}) + D_t}{P_{t-1}}$$

Where,

R = Annual rate of return

$P_t$  = Price of a stock at time t

$P_{t-1}$  = Price of stock at time t-1

$D_t$  = Cash dividend received at time

Above formula can be used to determine both actual one period return (when based on historical figure) as well as expected one period return (when based on expected dividends and prices). The return in the parenthesis is the number of the above equation represents the capital gain or loss during the period.

Holding period return measures mentioned above is useful with an investment horizon of one year or less. For longer periods, it is better to calculate rate or return as an investments yield. The yield calculated is present value based and this considers the time value of money.

Annualized rate or return over several periods can be calculated in two ways. The first one is simply to take the arithmetic average of the annual holding period returns over a given period and the second one, which also takes account the compounding effects of cash receipts over different time intervals is the geometric mean rate of return.

The simple arithmetic means:

$$\overline{\text{HPR}} = \sum_{t=1}^n \frac{\text{HPR}_t}{n}$$

The Geometric mean

$$\overline{\text{HPR}}_g = \sum_{t=1}^n (1 + \text{HPR}_t)^{1/n} - 1$$

Where  $\text{HPR}_t$  is the individual period return,  $n$  is the number of period and  $\sum$  represents the product (or the result of multiplication) (Cheney and Moses, 1996:93).

## **2.1.4 The Risk on Common Stock**

### **2.1.4.1 Risk**

In general sense, risk means chance of loss. Having greater chances of loss are viewed as more risky than those with lesser chances of loss. In broad sense, risk is the uncertainty in return from investment. Risk is a complicated subject and needs to be properly analyzed. The relationship between risk and return is described by investor perception about risk and their demand for compensation. Generally, Investors are mostly interested in the project yielding higher returns in less risk. Therefore, it is the investors required risk premium that establishes a link between risk and return. In a market dominated by rational investor higher risk will command by rational investor's higher risk will be commanded by rational premium and the trade-off between the two assumed linear relationships between risk and risk premium. "The observe difference in both the levels and variability of the rates of return across. Securities are indicative

of the underlying risk and return relation in the market" (Loric, Dodd and Hampton, 1996: 296).

Risk defines most generally is the probability of the occurrence of unfavorable outcomes. But risk had different meaning in the different context in our context; two measure developments from the probability distribution have been used as initial measure of return and risk. There are the mean and the standard deviation of the probability distribution (Weston and Brigham, 1982:557).

There are many ways to measure risk. The following three models are commonly used (Van Horne, 1998:205).

### **Standard Deviation**

The standard deviation is a traditional tool for measuring total risk. It measures the dispersion of forecast returns when such returns approximate a normal probability distribution. It is a statistical concept and is widely used to measure risk from holding a single asset. The standard deviation is derives so that a high standard deviation represents a large dispersion of return and is a high risk and vice versa. Mathematically, it is denoted by  $\sigma_j$

### **Beta Coefficient**

Beta coefficient is the mathematical value which measures the risk of one asset in terms of its effects on the risk of a group of assets, as would be the concern for an investor holding stocks and bonds. It is derived mathematically so that high beta indicates a high level of risk whereas a low beta represents a low level of risk. Mathematically, " $\beta_j$ " denotes it.

### **Subjected Estimates**

A subjective risk measure occurs when qualitative rather than quantitative estimates are used to measure dispersion. As an example: an analyst may estimate that a proposal offers a "low" level of risk. This means that, in the analyst's view – the dispersion of return will not be very wide. Similarly, a

"high" risk level will accompany a project whose forecast return may vary a great deal.

With the overall definition of risk as dispersion of return, there are two components of risk that may be identified.

### **1. Business Risk**

Business risk may be defined as the chance that the firm will not have the ability to complete successfully with the assets that it purchases. For an example: the firm may acquire a machine that may not operate properly, that may not produce stable products or that may face other operating or market difficulties that cause losses. Any operational problems are grouped as business risk.

### **2. Financial Risk**

This is the chance that an investment will not generate sufficient cash flows either to cover interest payment on money borrowed to finance it or principal repayment on debt or to provide profits to the firm.

### **Sources of Risk**

Every investment has uncertainties. Uncertainties on future return make it risky. The sources of uncertainty that contribute to investment risk are as follows: (Pradhan, 1992: 62).

### **Interest Rate Risk**

It is the potential variability of return caused by changes in the market interest rates. In more general terms, if market interest rates rise, then investment values and market prices will fall, and vice versa. This interest rate risk affects the prices of bonds, stocks, real estate, gold, puts, calls, futures contracts and other investments as well.

### **Purchasing Power Risk**

It is the variability of return and investor suffers because of inflation. Economists measure the rate of inflation by using a price index. The consumer price index (CPI) is a popular price index in the United States. The percentage change in the CPI is widely followed measure, of the rate of inflation.

### **Management Risk**

Management risk is defined as the variability of return caused by decision made by a firm's management and board of directors. Though many top executives earn princely salaries, occupy luxurious offices, and wield enormous power within their organizations, they are mortal and capable of making mistake or a poor decision. Furthermore, errors made by business managers can harm those who have invested in their firms. Forecasting management errors is difficult work that may not be worth the effort and, as a result, imparts needlessly skeptical outlook. Agency theory provides investors with an opportunity to replace skepticism with the informed insight as they endeavor to analyze subjective management risk.

### **Liquidity Risk**

Liquidity risk is associated with uncertainty created by the inability to sell the investment quickly or cash. The return variability will increase if price discount and sales commission are to be given in order to liquidate assets in time. The less the liquidity, the greater will be the risk. So, two factors price and time are associated with liquidity.

### **Default Risk**

Default risk is that portion of investments total risks that results from changes in the financial integrity of the investment. It is related to the probability that some or all of the initial investment will not be returned.

### **Bull-Bear Market Risk**

The various market forces make securities price upward and downward. The upward trend of market price (Bull Market) and downward trend of market price (Bear Market) create a long lasting source of investment at risk.

### **Call – Ability Risk**

Some securities are issued with a call provision i.e. a company may call back the securities issued before their maturity. The call ability risk is portion of a securities total variability of return that derives from the possibility that the issue may be called.

### **Convertibility Risk**

Convertibility risk is that portion of the total variability of return from a convertible bond or convertible preferred stock that reflects the possibility that the investment may be converted into the issuer's common stock at a time or under terms harmful to the investor's best interests.

### **Industry Risk**

An industry may be viewed as a group of companies that compete with each other to market a homogeneous product. Industry risk is that portion of an investment total variability of return caused by events that affect the products and firms that make up an industry. The stage of the industry's life cycle, international tariffs and/or quotas on the products produced by an industry related taxes industry wide labor union problems environmental restriction, raw materials availability and similar factors interact and affect all the firm in an industry simultaneously. As a result of these commonalities, the prices of the securities issued by competing firms tend to rise and fall together.

The uncertainties discussed above are the major sources of investment risk, but by no means do they make up an exhaustive test. If all the uncertainties could be listed, they would add up to total risk or total variability of returns.

## **Political Risk**

Political risk is the portion of assets' total variability of return caused by changes in the political environment (domestic and international as well as internal changes of the company). The current Nepalese political environment has made a significant impact on the investment to increase losses.

### **2.1.4.2 The Risk on Common Stock**

In simple word, risk is an uncertainty. Risk and uncertainties are the facts of life so to the common stockholders. Technically, their meanings are different. Risk, simply in investment, means a chance of happening some unfavorable event or danger of losing some value. Risk suggests that a decision maker known the possible consequences of a decision and their relative livelihoods at the times he makes decision. In other, uncertainty is simple a lack of definite outcomes, its anything that could happen-any unknown event, which may be favorable, or unfavorable on the other hand. Uncertainty involves a situation about which the likelihood of the possible outcomes is not known. The trouble arises from the fact that despite different interpretation of uncertainty and risk, people often use them interchangeably. Although it is quite clear what precisely these two terms mean, authorities in the field of finance do agree that the risk is the product of uncertainty. If we interpret certainty as future outcomes, which is 100% sure to happen, uncertainty is then just the opposite of certainty that refers to all possible future outcomes none of which is know for sure to happen.

Risk, on the other hand, is the product of all potential outcomes expressed with probability associated with each of them and it is measure in terms of the degree of variability in the probability distribution of such outcomes.

"The practice is to translate the uncertainty into a mathematical value which represents the uncertainty into a mathematical value which represents the best estimate of all uncertain value. But risk is treated differently. Although risk arises from uncertainty, its magnitude depends upon the degree of variability in

uncertainty cash flows, and it is measure in term of standard deviation. In project analysis, the project risk indicates the probability of return is being less than exceed value-higher the probability of such loss or less return, higher the project risk" (Pradhan, 1992:244).

Assets having greater chances of loss are viewed as move risky than those with lesser chances of loss. More systematically, the term risk is used interchangeably with certainty to refer to the variability of return associate with a given asset. For example, a government bond that guarantees its holder \$100 interest after 30 days has no risk, since there is no variability associated with return. In equivalent investment in a firm's common stock that may earn over the same period anywhere from \$0 to \$100 is very risky due to high variability of return. The more certain returns from an asset, the less variability and therefore the less risk.

### **2.1.5 Relationship between Risk and Return**

"The observe difference in both the levels and variability of the rate of return across securities are indicative of the underlying risk and relation in the market" (Vhalla, 2001: 480).

"The expected return from any investment proposal will be linked in fundamental relationship to the degree of risk in the proposal. In order to be acceptable a higher risk proposal must offer a higher forecast return than lower risk proposal." (Hampton, 1996:341).

Generally, there is a positive relationship between rate or return and risk. It means an investor can usually attain more return by selecting dominant assets that involve more risk. While it is not always true that a riskier asset will pay a higher average rate of return, it is usually. The reason is that investors are risk averse. As a result, high-risk assets must offer investors' high return to induce them to make the riskier investment normally; investors are likely to prefer more return and less risk. It means investors will not choose an investment that

guarantee less return when investments promising higher returns in the same level of risk class are readily available.

### 2.1.6 Portfolio

A combination of two or more securities or assets is portfolio. Portfolio management is related to the efficient portfolio investments in financial assets. Investors rarely place their entire wealth into a single asset or investment rather they construct a portfolio or a group of investments. Therefore, it is needed to extend analysis of risk and return to include portfolio. It has following two types of objective.

Objectives:

- ❖ To minimize risk, if return is equal
- ❖ To maximize return, if risk is equal

Assumptions:

- ❖ Investors are risk averter.
- ❖ Expected return is the mean value of probability distribution of future return.
- ❖ Variability in return is the risk.
- ❖ High risk taking investors expects high returns where low risk taking investors expects low returns.
- ❖ Investor follows principle of dominance.

The expected return on the portfolio is simply a weighted average of the expected returns of the individual securities that they are included in the portfolio. The weighted are equal securities (the weight must sum to 100% or 1). The general formula for expected return of a portfolio ( $R_p$ ) is as follows.

$$\overline{R}_p = \sum_{j=1}^n W_j \overline{R}_j$$

Where,

$$\overline{R}_p = \text{Expected return of a portfolio}$$

$\overline{R}_j$  = Expected return for security j

$W_j$  = Proportion of total funds invested in security j

$n$  = Total no. of different securities in the portfolio

While the portfolio expected return is a straight forward weighted average of returns on the individual security where as portfolio standard deviations would be to ignore the relationship or correlation between the returns of two securities. "The Standard deviation of probability distribution of possible portfolio return  $\sigma_p$  is

$$\sigma_p = \sum_{j=1}^n \sum_{k=1}^n W_j \cdot W_k \cdot \text{Cov}_{j,k}$$

Where,

$n$  = Total no. of different securities in the portfolio.

$W_j$  = Proportion of total funds invested in security j.

$W_k$  = Proportion of total funds invested in security k.

$\text{Cov}_{j,k}$  = Covariance between the possible return of securities j and k.

The covariance of the possible returns of two securities is a measure of the extent to which they are expected to vary together rather than independently of each other. The covariance term in the above formula can be written as.

$$\text{Cov}_{jk} = r_{jk} \sigma_j \sigma_k$$

Where,

$r_{jk}$  = Correlation coefficient between possible return for security j and k

$\sigma_j$  = S.D. of the security j.

$\sigma_k$  = S.D. of the security k.

When  $j = k$ , the correlation coefficient is 1 as variance movement correlated perfectly with itself.

"The correlation coefficient which is significant in portfolio construction is standardized statistical measured of the linear relationship between two variables. Its range from -1 (perfect negative correlation) to +1 (perfect positive correlation). Lesser the correlation, higher the reduction in portfolio risks" (Van Horne and Wachowicz, 1995: 97).

The positive correlation coefficient shows that the return from the securities generally moves in the some direction. While negative correlation coefficient shows that they move to opposite direction and zero correlation coefficient shows that the returns from two securities are uncorrelated. They show no tendency to vary together in either a positive or negative in linear function.

### **The Single Index Model**

"The Markowitz Model was theoretically elegant and conceptually sound. However, its serious limitation was that it related each security to every other security in the portfolio, demanding the sophistication and volume of work well beyond the capacity of all but a few analysts. Consequently, its application remained severely limited until William F. Sharpe published a model simplifying the mathematical calculations required by the Markowitz Model.

Sharpe assumed that, for the sake of simplicity, the return on security could be regarded as being linearly related to a single index like the market index. Theoretically, the market index should consist of all the securities trading on the market. However, a popular average can be treated as a surrogate foe market index. Acceptance of the idea of a market index, Sharpe argued, would obviate the need for calculating thousands of co variances between individual securities, because any movements in securities could be attributed to movements in single underlying factor being measured by the market index. The simplification of the Markowitz Model has come to be known as the Market Model or Single- Index-Model (SIM).

## Characteristic Lines

An old and rather quaint stock market aphorism asserts that *when they raid the brothel they take all girls*. The reference is to a so-called bear raid, in which bears (pessimists) raid the market, driving prices down. Completing the translation; the statement asserts that when the market falls dramatically, all stocks go down together

This sort of view is subject to criticism since market is rarely divided into bears (pessimists) and bulls (optimists). Nevertheless, there is an element of truth in the assertion. In major market moves, most securities move in the same direction, although at different rates. An analyst's view of the relationship between returns on individual securities and returns on the market portfolio can be expressed by using a *characteristic line*. Figure-1 shows an example. The vertical axis plots the excess return on the security in question. This is the difference between the holding period-period return on the security and the riskless rate of interest for the period. In symbols:

$$\text{Excess return on security } i = \tilde{R}_i - T$$

Where:

$$\tilde{R}_i = \text{period -holding return on security } i.$$

T = risk less rate of interest

For clarity, variables whose actual value is uncertain before the fact (ex ante) are indicated by tilder (i.e. squiggly lines such as  $\tilde{\phantom{x}}$ ).

The horizontal axis in Figure 1 plots its excess returns on the market portfolio; in symbol:

$$\text{Excess return on market portfolio} = \tilde{R}_m - T$$

Where:

$$\tilde{R}_m = \text{period -holding return on security } i.$$

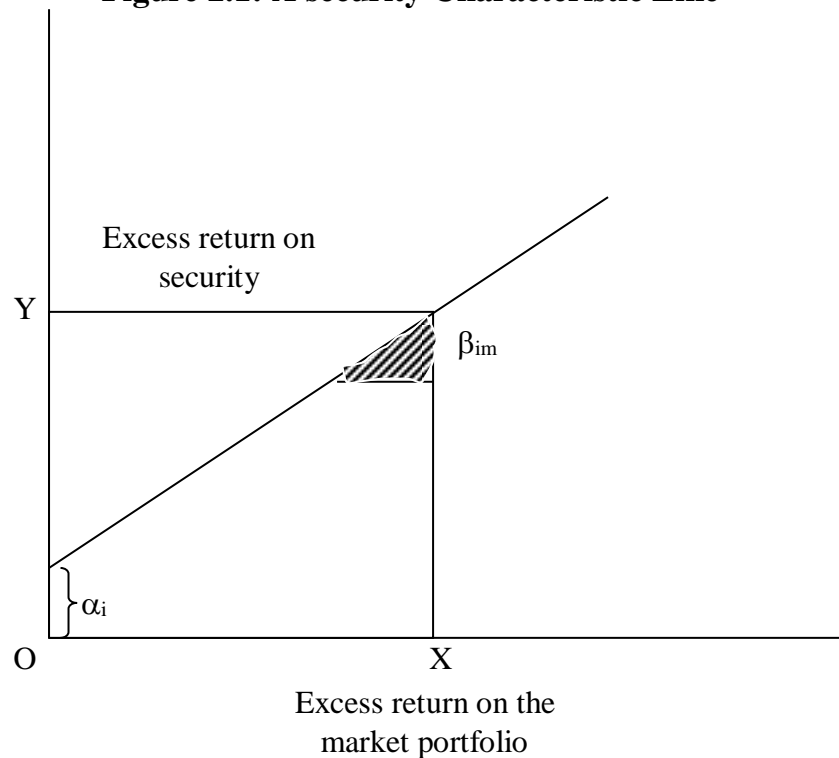
T = risk less rate of interest

The market portfolio includes all securities, each in proportion to market value outstanding. The characteristic line, summarizing the relationship between the two excess returns, can be written as follows:

$$\tilde{R}_m - T = \alpha_i + \beta_{im}(\tilde{R}_m - T) + \tilde{r}_i$$

The value of alpha ( $\alpha_i$ ) and beta ( $\beta_{im}$ ) indicate the vertical intercept and slope, respectively, of the line, as shown in figure 1. The value of  $\alpha_i$  can be thought of as an excess return on the security that goes with an excess return of zero of the market portfolio, whereas  $\beta_{im}$  is the ratio of a change in the security's excess return is also likely to 1% larger than expected.

**Figure 2.1: A security Characteristic Line**



A beta of 2.0 indicates that if the market portfolio's excess return is 1% larger than expected, the best guess is that the security's excess return is likely to be 2% larger than expected. A beta of 0.5 indicates that if the market portfolio's return is 1% larger than expected, the best guess is that the security's excess return is likely to be 1/2 of 1% larger than expected. And so on.

Securities with beta values greater than one are termed aggressive: in up markets their prices tend to rise at a faster rate than the average security. On the other hand, they tend to fall at a fast faster rate in down markets. Securities with beta values less than one are termed defensive: in up markets their prices tend to rise at a slower rate than the average security. On the other hand, they tend to fall at a slower rate in down markets

The nature of the residual component of the unsystematic return, known as the error term,  $\tilde{r}_i$ , represent the uncertain portion of the non-market of the excess return on security i. This can be demonstrated by referring the characteristic line into two parts, as follows:

$$\tilde{R}_i - T = [\beta_{im}(\tilde{R}_m - T)] + [\alpha_i + \tilde{r}_i]$$

|                     |   |                           |
|---------------------|---|---------------------------|
| market (systematic) | + | non-market (unsystematic) |
| component           |   | component                 |
| of excess return    |   | of excess return          |

The term in the first set of brackets is the market related portion of excess return; the term in the second set is the non-market portion. By convention,  $\alpha_i$  represents the expected non-market excess return, while  $\tilde{r}_i$  represents the deviations from this expectation. Before the fact, the best guess is that  $\tilde{r}_i$  will be zero.

Given these figures, the value of  $\beta_{im}$  for the security can be easily found. The formula is:

$$\beta_{im} = \frac{Cov(\tilde{R}_i - T, \tilde{R}_m - T)}{Var(\tilde{R}_m - T)}$$

Where:

$Cov(\tilde{R}_i - T, \tilde{R}_m - T)$  = The covariance between the excess return on security I and the excess return on the market portfolio

$\text{Var}(\tilde{R}_m - T)$  = the variance of the excess return on the market portfolio.

The value of  $\alpha_i$  is the expected value of the non-market component of a security's excess return. The expected value of the market component will equal the security's beta times the expected return on the market portfolio. The value of alpha is thus the difference between the security's total expected excess return and this amount. In symbols:

$$\alpha_i = \text{Exp.}(\tilde{R}_i - T) - \beta_{im}\text{Exp.}(\tilde{R}_m - T)$$

Where,

$\text{Exp.}(\tilde{R}_i - T)$  = the expected excess return on security i

$\text{Exp.}(\tilde{R}_m - T)$  = the expected excess return on market portfolio" (Bhalla, 2001).

### 2.1.7 Systematic Risk and Unsystematic Risk

The portion of the total risk of an individual security that can not be diversified away is called systematic risk. It is also called unavoidable risk or market risk. Systematic risk affects all firms such as war, inflation, recession, interest rate change, depressions and long term changes in consumption in the economy.

The portion of the total risk that can be diversified away is called unsystematic risk. It is also called avoidable risk or non market risk. It is caused by events particular to the firm. For example product development, new patents, labour strike, irregular disorganized management, policies and consumer preferences. "For most stocks, unsystematic risk accounts for between 60 to 70 percent of stocks total risk or standard deviation (Van Horne and Wachowicz, 1995:91).

The relationship among systematic, unsystematic and total risk are shown below.

$$\text{Total risk } (\sigma_j) = \text{Systematic Risk} + \text{Unsystematic Risk}$$

Systematic Risk and unsystematic Risk can be written as

### Systematic Risk (SR)

$$SR = \frac{Cov_{j,m}}{\sigma_m}$$

Where,

SR = Systematic Risk

$Cov_{j,m}$  = Covariance of Stock j and Market Return

$\sigma_m$  = Standard Deviation of Market

### Unsystematic Risk (USR)

$$USR = \sigma_j - \frac{Cov_{j,m}}{\sigma_m}$$

$\sigma_j$  = Standard Deviation of Stock j

$$\text{Proportion of SR} = \frac{SR}{TR}$$

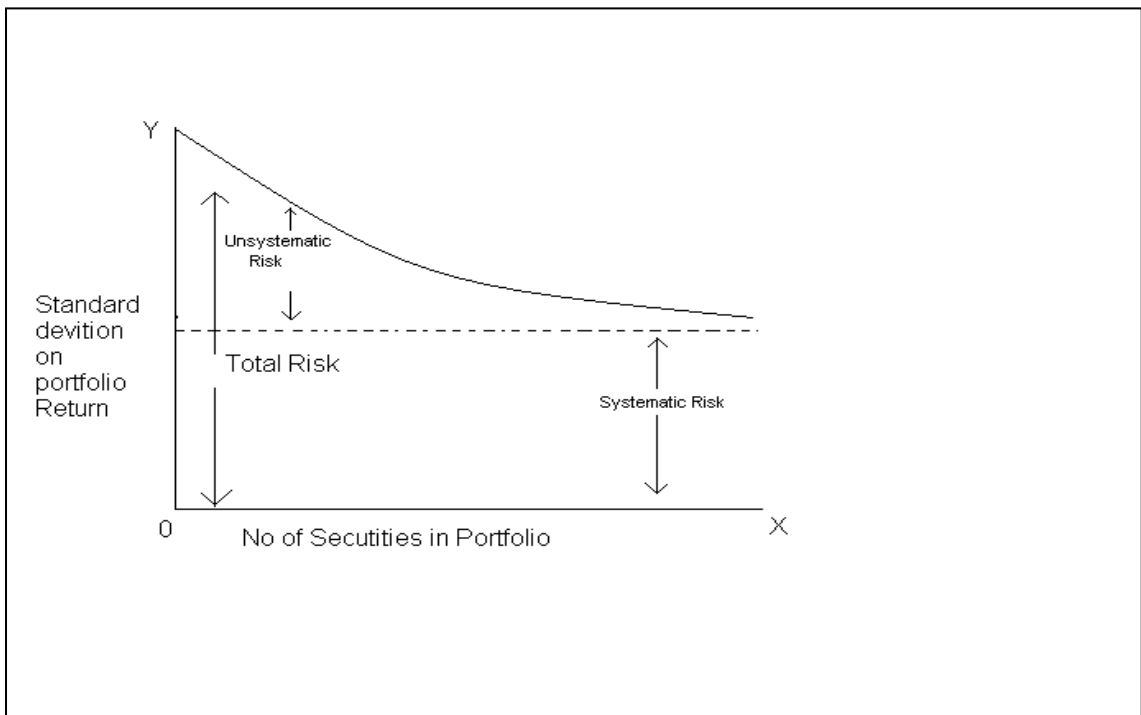
Where,

TR = Total Risk

Proportion of USR = 1 – Proportion of SR

**Figure 2.2**

**Portion of Risk on a Portfolio**



Where, systematic risk =  $\sigma_j P_{jm}$  and unsystematic risk =  $\sigma_j (1-P_{jm})$ . Here  $P_{jm}$  is the Correlation coefficient between the return of given stock (j)k and the return on market portfolio.

However by diversification, unsystematic risk can be reduced and ever eliminated if diversification is efficient. Therefore, not all the risk involved in holding a stock is relevant since part of their risk can be diversified away. The important risk of stocks is its unavoidable systematic risk. Investor will be compensated for bearing this systematic risk. They should not however expect the market to provide may extra compensation for bearing avoidable risk. It is the large that lies behind Capital Assets Pricing Model (CAPM).

### **2.1.8 Capital Asset Pricing Model (CAPM)**

To estimate required rate of return on a security, the Capital Assets Pricing Model provides a means. This is the extension of model portfolio theory. This theory was given by William F. Sharpe and John Linter in 1960's. CAPM has had important implications for finance ever since. And on the basis of price and divided data, expected return can be calculated with comparison of these two returns investors can analyzed whether the stock is under priced or overpriced.

Based on the behavior of the risk adverse investors, there is implied on equilibrium relationship between risk and expected return to provide a return on common stock with its unavoidable risk. This is simply the risk that cannot be avoided by diversification. The great unavoidable risk of security, the greater the return that investor will expected from the security (Van Horne, 1997:64).

“CAPM is the model that describes the relationship between risk and expected return. In this model, a security's expected (required) return is the risk free rate plus a premium based on the systematic risk of the security. This model is expressed as:

$$E(R_j) = R_f + [E(R_m) - R_f]\beta_j$$

Where,

$E(R_j)$  = Required rate of return for stocks j

$R_f$  = Risk free rate

$E(R_m)$  = Expected return for market portfolio

$\beta_j$  = An index of systematic risk of stock j (beta coefficient)

“Beta measures the sensitivity of a stock’s returns to change in the returns on the market portfolio. The beta of a portfolio is simply a weighted average of the individual stock betas in the portfolio” (Van Horne, 1997:100).

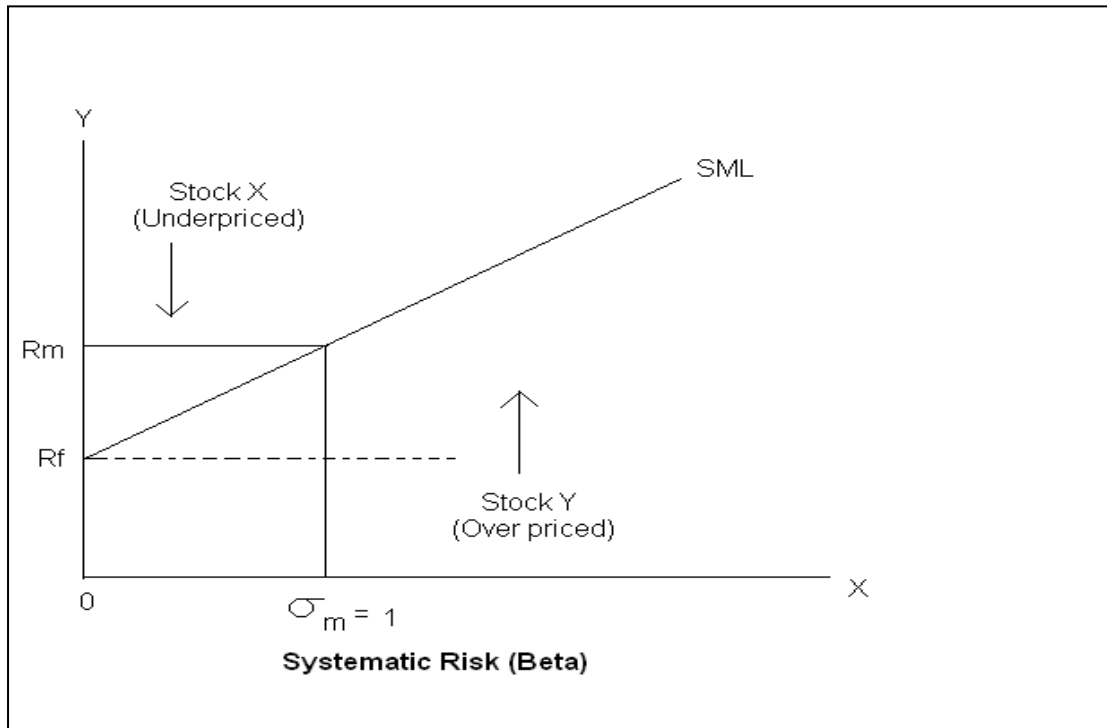
If beta is one (i.e.  $\beta=1$ ) then the required return is simply the average return for all situation, that is the return on market portfolio, otherwise, the higher the beta, higher the risk premium and the total required return. However, a relatively high beta does not guarantee a relatively high return. The actual return depends partly on the behavior of the market, which acts as a prissy for general economic factor.

The CAPM states that the expected risk premium on each investment is proportion to its beta. This means that each investment should lie on the sloping security market line connecting treasury bills and market portfolio. CAPM is the predominant model used for estimating equity risk and return. Comparison between the expected rate of return and required rate of return indicates whether the stock is under priced or overpriced. And when these two returns are equal then it is said table market equilibrium i.e. all the stock lie on the Security Market Line (SML).

SML is the graphical representation of the CAPM, which shows the relationship between risk and required rate of return. The SML clearly shows that returns are the increasing function, in fact at linearly increasing function of risk. Further, it is only market risk that affects return. The investor receives no added return for bearing the diversifiable risk. If stocks are under priced it lies above the SML and if they are overpriced then it lies below the SML. The

following diagram shown the SML with over priced and the under priced stocks.

**Figure 2.3**  
**The Security Market Line (SML)**



“Above figure clarifies that stock X is under priced relative to the security market price while stock Y is overpriced. As a result stock X is expected to provide a rate of return greater than that required based on its systematic risk. In contrast stock Y is expected to provide a lower return than that required to compensate for its systematic risk. Investors seeing the opportunity for the superior return by investing in stock X will rush.

This situation would drive the price up and expected return comes down. It would continue until the market price was seen that the expected return would now lie on the SML. In the case of stock Y, investors holding this stock will start to sell it, recognizing that they could obtain a higher return for some amount of systematic risk with other stocks. This selling pressure would drive market price down and its expected return goes up until the expected return matches on the SML. When the expected return for these two stocks returns to

SML, market equilibrium will again prevail (Van Horne and Wachowicz, 1995: 107).

Under the CAPM, each investors hold the market portfolio and is concerned with its standard deviation because this will influence the slope of the SML and hence the magnitude of his/her investment in the market portfolio.

“The CAPM is sometimes used to estimate the required rate of return for my firm with publicly traded stock. The CAPM is based on the promise that the only important risk of firms is systematic risk, or the risk that returns form expose to general stock market movements. The CAPM is not concerned with so-called unsystematic risk, which is specific to an individual firm, because investors can avoid that type of risk by holding diversify portfolio (Madura, 2001: 118).

Investor appears to be concerned principally with risk that they cannot eliminated by diversification. If this is not so, we find that stock price increases. Whenever two companies merge to spread their risk and we should find that investment companies which invest in the share of other firm are more highly valued that than the shares they hold. But we do not observe either phenomenon. Mergers under taken just to spread risk don't increase stock prices and investment companies are no more highly valued than the stocks held. The CAPM model captures these ideas in simply way. That's way many financial mangers find it is the most convenient for coming to decision with slippery motion of risk. And it is why economist often uses the CAPM to demonstrate important ideas in finance even when there are other ways to prove thee ideas.

## **2.2 Reviews from Journals**

In Nepal, there are very limited numbers of journals available in the subject of management and it is also hard to find any article in the subject matter of finance. Almost no articles about the risk and return analysis on common stock

investment are found. Hence some foreign well known recently published journals of finance has been reviewed here. However, it helps to build the conceptual framework on this topic.

An article entitled "*Expected Return, Realized Returns and Assets Pricing Tests*" by Edwin J. Elton as journal of finance in the year 1999 is relevant to this study. In this paper he points out the fundamental issues in finance like that what the factors are that affect expected return on assets, the sensitivity of expected return to those factors, and the reward for bearing this sensitivity. There is a long history of testing in this area and it is clearly one of the most investigated areas in finance.

Almost all of the testing being aware of using realized returns as a process for expected returns. The use of an average realized return relies on a belief that information surprises tend to average out over the period of a study and realized returns are therefore an unbiased estimate of expected returns. However, he believes that there is ample evidence that this belief is misplaced. There are periods longer than 10 years during which stock market realized returns are on average less than the risk free rate (1973 to 1984). There are periods longer than 50 years in which risk long term bonds on average underperform the risk free rate (1927 to 1981). Having a risky asset with expected return above the risk free rate is an extremely weak condition for realized returns to be an appropriate process for expected return, and 11 and 50 years is an awful long time for such a weak condition not to be satisfied. In the recent past, the United States has had stock market returns of higher than 30% per year while Asian Markets have had negative returns (Elton, 1999:26).

The journal of finance, published by American Finance Association for many decades is taken into account. In its volume of August 1999, an article "*Local Return factors and Turnover in Emerging Stock Markets*" by K. Greet Rouwenhast. This paper examines the sources of return variation in emerging stock markets. Compared to the developed markets the correlation between

most emerging market and stock market has been historically low and until recently many emerging country restricted investment by foreign investor.

He attempts two set of question to answer. The first set of three questions concern the existence of expected return premiums. (i) Do the factors that explain expected return difference in developed equity markets also describe the cross section or expected returns of emerging market firms?(ii) Are the returns factors in Emerging markets primarily local or they have global components as well? (iii) How does the emerging market evidence contribute to the international evidence form developed markets that similar return factors are present in markets around the world? The set of questions of the paper include, (iv) is there a cross sectional relation between liquidity and average, returns in emerging markets? Are the return factors in emerging markets cross sectional correlated with liquidity?

Total returns are calculated in the sum of the dividend return and price appreciation using prices scaled by a capital adjustment factor, which the IFC computers to correct for price effects associated with stock splits, stock dividends and rights issues. Many emerging market have firms with multiple share assess are treated as a single value weighted portfolio of the outstanding equity securities (Rouwenhorst, 1999:1442-1443).

In this proper Roowenhorst has been made detail analysis of the data and he interprets the result in each section. Lastly, he has concluded his findings as "The first conclusion is that the return factors in emerging markets are qualitatively similar to those in developed markets: Small stocks out perform growth stocks and emerging market stocks exhibit momentums. There is no evidence that local market betas are associated with average returns. The low correlation between the country return factors suggest that the premium have a strong local character. Furthermore, global exposure cannot explain the average factor returns of merging market. This is little evidence that the correlation between the local factor portfolios have increase, which suggests that the

factors responsible for the increase of emerging market country correlation are separated from those drives the difference between expected return within these markets. A Bayesian analysis of Premiums in developed and emerging markets shows that unless one has strong prior belief to the contrary. The empirical evidence favors the hypotheses that size, momentum and values strategies are compensated for in expected returns around the world. Finally, the paper documents the relationship between expected returns and share turnover and examines the turnover characteristics of the local factors portfolios. There is no evidence of relation between expected returns and turnover, in emerging markets. However, beta, size momentum and value are positively cross sectionally correlated with turnover in emerging markets. This suggests that return premium do not simply reflect a compensation for liquidity. (Rouwenhorst, 1999:1462)

After reviewing, an article entitled American Association of Individual Investors, Investing basis reveals importance to understand how personal circumstance affect investment decision. (If these factors make no difference we could simply publish one suggested portfolio for everyone to follow). Investment profile is the beginning of the asset allocation process, which consists of dividing portfolio among the major asset categories of stocks, bonds and cash. The asset allocation decision will have a far more effect on portfolio return.

Make allocation decision with the major categories. For instance stock portfolio can be divided among large capitalization stock, small capitalization stocks and international stocks. Once these decisions are reached, you will be ready to make selection among the various investment options. Lastly, once you have set up your investment portfolio you must monitor it, making changes when appropriate.

Every investor wants the highest assured return possible. Both as we have seen, returns are not certain and different investors have varying degree of uncertainty that they are willing accept.

In order to reduce overall risk, it is the best to follow diversification of assets that are not related. "The technical term for this is not putting all your eggs in one basket". In that way if you trip, you won't break all the eggs. The creation of a portfolio by combining two assets that behave exactly the same way cannot reduce the portfolio's overall risk below the risk of the least risky asset.

Fluctuations expose you to wide uncertainty in your overall returns and even to the risk of permanent loss of principal. CAPM is an effective model in finance but it is not far off from argument. It has also got it good points as well as bad points.

It tells us where to invest, how to invest and what discount rate to use for project cash flows. Not only that, it is a disarmingly simple model. The expected return of a security depends upon a simple statistics. The relationship between risk and return is linear. Calculation of portfolio risk trivial at the sometime, the CAPM is revolutionary. It tells us that the variance of a project is not a factor in determining the appropriate risk adjusted rate. It turns financial research from roll-up-your sleeves fundamental analysis into a statistical problem. In short, the CAPM turned Wall Street on its head.

### **2.3 Review of Other Independence Studies in Nepal**

There are very few independent studies in the case of this research topic, risk and return analysis. However, the available independent studies which are related to the topic are reviewed here.

The study carried out by professor Dr. Manohar Krishna Shrestha (1995) in the title of "*Shareholder's Democracy and Annual General meeting feedback*" is reviewed here Dr. Shrestha prefers to consider this book as assemblage of opinions which he had express in different occasions of various annual general

meeting where he has critically analyzed the situation of common stock investors and the situations that is not improving till date.

The content of the book have been divided into two parts. The first part includes views on the rights of the shareholders regarding how they can exercise them in democratic perspective, where as the second part consists of feedback and the issues raised by shareholders at different annual general meeting of the public limited companies and financial institutions.

Writer has found the overall shareholders democracy in terms of the protection of their interest, is basically focused on the payment of satisfactory wealth by appreciating the value or share they hold.

“In many cases the existing authoritarian mentality of management seems to have not considered the share holders in deciding managerial plans and policies. Top level decision often by pass the interest of shareholders. As the management lacks serious concerns about the protection of shareholders rights and expectations. The annual general meeting has become a plate-form for shareholders to express their opinions and grievance in front of the management and board of directors.

Many general meeting feedback reveal no serious response so the feelings of shareholders. Thus it reflects unwillingness of the management and broad of director to change their traditionally held activities towards shareholders.

Dr. Shrestha has expressed his deep concern to the government for not taking my initiative formulating the separate act which protects the shareholders right despite the increase in population of shareholders in Nepal and questioned the need of separate act are regarding the protection of shareholders right.

He has further quoted as writing company and other acts relating to financial and industrial sector have provisioned rights of the shareholders as: (1) voting rights, (2) participation in general meeting, (3) rights of getting information, (4)

Electing as a board of director, (5) participation in the profit and loss of the company, (6) transferring share and (7) priority representation.

The collective rights of the shareholders are

- 1) Amend the internal by laws
- 2) Authorized the sales of assets
- 3) Enter into merger
- 4) Change amount of authorized capital

As reviewed above, Nepalese stock being in emerging state; study conducted previously in Nepal in relation with the subject was not in specific issues but in broad manner.

An article published in business age by Nawaraj Pokharel (Oct.-Nov. 1999) "*Stock Market doing Pretty Well*" is reviewed here.

In this article he has that the investment on the shares of manufacturing and processing was more attractive than of the banks. He found that the share of individual companies showed very good performance from October 1998 to 1999. NEPSE index showed upward trend for all the shares in this period. He gave following reasons behind the appreciation of share price.

- ❖ Companies have rewarded shareholders.
- ❖ Reduction of interest rate of money market.
- ❖ Healthy speculation and loan has made the market interesting by providing loan to the stock investors their share as collateral.
- ❖ Investors are appearing more rational in their investment decision.

Finally, he concludes that the capital market needs more infrastructure investment than institution investment once the required infrastructure can facilitate the market, the size of the market could be made even bigger by introducing new instruments such as government bonds.

Next here is an article published in business age magazine by Atma Ram Ghimire (June 2001) "*Nepal share market and investors prospect*". In this study he has pointed out some important trends our capital market. He has concluded that the Nepalese share price is decreasing because of many unbalanced factors. The major reason behind the movement in the index is the domination of the banking sector scrip in the Nepalese stock market transactions. Mismanagement practices cannot help the growth of share market. The general public has invested recklessly. They just believe what one broker or the investor says about scrip. One of the prime motives for the investment is to earn return on it. Finally he concludes that the general investors should be alert and aware of the situation. They must receive the financial information before they make investment and act rationally.

Similarly, Narayan Prasad Poudel (2001) also carried out another study in a topic of "*Investing in shares of Return and Risk elements*". The study was based on the data collected for eight banks from mid July 2001. The main objectives of the study was to determine whether the shares of commercial banks in Nepal are over or under priced by analyzing risk and return characteristics of the individual share.

Mr. Poudel summarized the following finding:

- ❖ Most of the individual share's appeared to be defensive as beta coefficients were less than one. Only the return of share of Bank of Kathmandu had beta coefficient of greater than one, indicating that the share was more risky than the market.
- ❖ Nepal Arab Bank Ltd., Nepal Indosuez Bank Ltd., Himalayan Bank Ltd. Had higher expected equilibrium return than expected rate or return. And standard Chartered Bank Ltd., Nepal SBI Bank Ltd., Nepal Bangladesh Bank Ltd., Bank of Kathmandu Ltd. Had lower equilibrium return than expected rate or return.

- ❖ From this study we get Nepal Arab Bank Ltd., Nepal Indosuez Bank Ltd. and Himalayan Bank Ltd. was overpriced and other were under priced.

## **2.4 Reviews from Thesis**

It (risk and return analysis) is not new concept. But in Nepal, due to the environment of capital market it is getting more importance. However, playing the vital role in investment, there are few studies are made regarding this topic. Some studies related to the topic of risk and return has been conducted for the fulfillment of master degrees in T.U. In this study only relevant subject matters are reviewed which are as follows.

Shanker Kumar Mishra (2002) analyzed “*Risk and Return on common stock investment of commercial Banks in Nepal*” with special reference to five listed commercial banks. The major objective of this study was to promote and protect the interest of the investor by regulation the issuance sales and distribution of securities and purchases, sale or exchange of securities. He also intends to supervise and monitor the activities of the stock exchange and of other related firms carrying on securities business. In addition he tried to render contribution to the development of capital market by making securities transactions fair health, efficient and responsible.

Followings are the finding of the Study

It was noticed that there is a positive correlation between risk and return character of the company. Nepalese capital market being inefficient, the price index itself is not sufficient to give the information about the prevailing market. Situation and the company proper regulation should be introduced so that there is more transparency in issuance, sales and distribution of the securities. Investors do not have any idea about the procedures of the securities issuance. Neither company nor the stock brokers transmit any information to the investors about the current market situation and hence it becomes difficult for a

common investors to invest in the securities. Both government authorities and the stock exchange regulator body should try to promote healthy practices so that the stock brokers do not give false information to the investors for their personal benefit which is a common practice in Nepal. Investors should get regular information about the systematic Risk (Beta), Return on Equity and P/E Ratio of various listed companies in some way; it is given in economic times for the companies listed in Nepal Stock Exchange. Security exchange Board of Nepal should make this mandates that it is easier for the investors to calculate risk and return of portfolio and transparency is increased.

Manilata Manandhar (2003) in her study “*Analysis of Risk and Return analysis on Common Stock Investment*” with special reference to five listed commercial banks. The main objective of the study is to examine risk and return of common stock in Nepalese stock market, the study is focused on the common stock of commercial banks.

In her findings “Banking industry is the biggest one in F/Y 057/058 in terms of market capitalization and turnover expected return of the common stock of BOKL is maximum (i.e. 1.1267) due to effect of unrealistic annual return and Capital Structure of NIBL is found minimum. In the context of industries, expected return on banking sector (i.e. 67.39) is highest and other sector is the least (0.65%). Except NIBL, other banks other banks common stocks are more volatile (aggressive with market stocks). All banks in the study are said to be under priced. Capital Structure of BOKL is most risky and Capital Structure is least risky.

Followings are the findings of Mrs. Manandhar's Study

- ❖ Stocks have greater volatility risk than other investment, which take a random and unpredictable path. Stock market is risky in the short term and it is necessary to prepare the investors for it.

- ❖ One of the most important things to consider when choosing investment strength is the balance between risk and return that you are comfortable with
- ❖ Investors should diversify their fund to reduce risk with the help of optimal portfolio concept.
- ❖ It is better to say something that is going up and sell something that is going down.
- ❖ Investor's attitude, perception and risk handling capacity also play essential role in rational investment decision.

Ram Hari Khadka (2004) in his study "*Analysis of Risk and Return on selected Nepalese Commercial Banks listed in NEPSE*" with special reference to 7 listed commercial banks is also relevant to this study. The main objective of the study is to analyze the risk, return and other relevant variables that help in making decision about investment on securities of the listed commercial banks. This study will also target to determine whether the share of commercial banks are correctly priced or not by analyzing the required rate of return using the CAPM. Khadka addressed the following findings in risk return behavior from the analysis of different stock.

The share of Bangladesh Bank offered highest realized rate or return. Amongst them NABIL bank is the lowest having 5.23% which is less than required rate or return. NBL, which is hard hit by the events (Return = -0.8809), the ranking of the bank is placed as the highest return earner. The study showed that the realized rate or returns of the sample banks do not have the same features being within the range of 5.23% to 16.12%. Return on the average stock is 5.51% over the period. All the shares under review generated higher rate of return than the market portfolio except NABIL Bank Ltd. The price of shares of banks under review except NABIL Bank Ltd. are under priced. The unsystematic risk of NBL is the highest one amongst the shares under review which is 95.59% and SCB of Nepal has the lowest one being 45.14%. The negative correlation coefficient of NBL (-0.21) revealed that the return on the

bank goes down if the market goes up. The rest of the shares moved in the direction the market moves. By observing the individual shares beta coefficient, most of the shares appear to be defensive as beta coefficient is less than one. However, beta of the stocks NB bank SCB are greater than one indicating that the shares are more riskier than the market..

On the basis of finding, Khadka concluded that in Nepalese capital market, the contribution of real sector is negligible. Though the shares of commercial Banks of Nepal are heavily traded in NEPSE, none of the share NABIL Bank will have positive trend towards the equilibrium.

He outlined following Recommendations:

- ❖ Adoption of comprehensive and Advance Regulatory framework.
- ❖ Awareness campaign for the investor.
- ❖ Regular publication of financial information.
- ❖ Improvement in the infrastructure facilities.
- ❖ Effective use of banking system.
- ❖ Deregulation of foreign exchange.

Surendra Manandhar (2005) in his study “*A Study of Risk and Return Analysis on Common Stock Investment*” with special reference to six listed commercial banks. The main objective of the study is to evaluate common stock of listed commercial bank in terms of risk and return and to perform sector wise comparison on the basis of market capitalization, to identify whether the share of commercial banks are overpriced, under priced or at equilibrium price, to identify the correlation between returns of commercial banks, & to construct optimum portfolio from listed common stock.

Khadka (2008) in his study “*Analysis of Risk and Return on selected Nepalese Commercial Banks listed in NEPSE*” with special reference to 7 listed commercial banks is also relevant to this study. The main objective of the study is to analyze the risk, return and other relevant variables that help in making decision about investment on securities of the listed commercial banks. This

study will also target to determine whether the share of commercial banks are correctly priced or not by analyzing the required rate of return using the CAPM. Khadka addressed the following findings in risk return behavior from the analysis of different stocks.

The share of Bangladesh Bank offered the highest realized rate of return. Amongst them NABIL bank is the lowest having 5.23% which is less than the required rate of return. NBL, which is hard hit by the events (Return = -0.8809), the ranking of the bank is placed as the highest return earner. The study showed that the realized rate of returns of the sample banks do not have the same features being within the range of 5.23% to 16.12%. Return on the average stock is 5.51% over the period. All the shares under review generated a higher rate of return than the market portfolio except NABIL Bank Ltd. The price of shares of banks under review except NABIL Bank Ltd. are underpriced. The unsystematic risk of NBL is the highest one amongst the shares under review which is 95.59% and SCB of Nepal has the lowest one being 45.14%. The negative correlation coefficient of NBL (-0.21) revealed that the return on the bank goes down if the market goes up. The rest of the shares moved in the direction the market moves. By observing the individual shares' beta coefficient, most of the shares appear to be defensive as the beta coefficient is less than one. However, the beta of the stocks NB bank and SCB are greater than one, indicating that the shares are riskier than the market.

On the basis of findings, Khadka concluded that in the Nepalese capital market, the contribution of the real sector is negligible. Though the shares of commercial banks of Nepal are heavily traded in NEPSE, none of the shares of NABIL Bank will have a positive trend towards equilibrium.

He outlined the following recommendations:

- Adoption of a comprehensive and advanced regulatory framework.
- Awareness campaign for the investor.
- Regular publication of financial information.

- Improvement in the infrastructure facilities.
- Effective use of banking system.
- Deregulation of foreign exchange.

Manandhar (2009) in her study “*Analysis of Risk and Return analysis on Common Stock Investment*” with special reference to five listed commercial banks. The main objective of the study is to examine risk and return of common stock in Nepalese stock market, the study is focused on the common stock of commercial banks.

In her findings “Banking industry is the biggest one in F/Y 057/058 in terms of market capitalization and turnover expected return of the common stock of BOKL is maximum (i.e. 1.1267) due to effect of unrealistic annual return and Capital Structure of NIBL is found minimum. In the context of industries, expected return on banking sector (i.e. 67.39) is highest and other sector is the least (0.65%). Except NIBL, other banks other banks common stocks are more volatile (aggressive with market stocks). All banks in the study are said to be under priced. Capital Structure of BOKL is most risky and Capital Structure is least risky.

Followings are the findings of Mrs. Manandhar's Study

- Stocks have greater volatility risk than other investment, which take a random and unpredictable path. Stock market is risky in the short term and it is necessary to prepare the investors for it.
- One of the most important things to consider when choosing investment strength is the balance between risk and return that you are comfortable with
- Investors should diversify their fund to reduce risk with the help of optimal portfolio concept.
- It is better to say something that is going up and sell something that is going down.

- Investor's attitude, perception and risk handling capacity also play essential role is rational investment decision.

Manandhar (2010) in his study "*A Study of Risk and Return Analysis on Common Stock Investment*" with special reference to six listed commercial banks. The main objective of the study is to evaluate common stock of listed commercial bank in terms of risk and return and to perform sector wise comparison on the basis of market capitalization, to identify whether the share of commercial banks are overpriced, under priced or at equilibrium price, to identify the correlation between returns of commercial banks, & to construct optimum portfolio from listed common stock.

## **2.5 Research Gap**

Risk and return is a broad topic in finance and investment. It is a continuous process of analyzing and interpreting the results that are obtained from the research. Investment is a dynamic process and investors required various information regarding the stock market and individual companies as soon as possible.

Thesis which are reviewed in this chapter also based on risk and return analysis of commercial banks and financial institutions are providing relevant information to shareholders and investors and the fact to carry out this thesis is to provide investors real accurate and updated information as soon as possible.

## **CHAPTER – III**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

Research methodology is the systematic way of solving research problems and which ultimately refer to the overall research process. Research methodology includes all the procedures from theoretical framework to the collection and analysis of the data. As most of the data are quantitative the research is based on the specific models. It is composed of both parts of technical aspect and logical aspect, on the basis of historical data. Research is systematic and organized effort to investigate a specific problem that needs a solution. This process of investigation involves a series of well thought out activities of gathering recording, classifying, analyzing and interpreting the data with the purpose of finding answer to the problem. Thus the entire process by which we attempt to solve problems is called research.

#### **3.2 Research Design**

The plan, structure, and strategy of investigation conceived so as to obtain answers to research questions and to control variance is research design. The research is based on the recent historical data, so simply it is a historical research. It covers the data from 2004/05-2010/11. It deals with the common stock of joint venture banks on the basis of available information. For the portfolio analysis, the common stocks of the selected joint venture banks are taken into account. This study is more analytical and empirical and less descriptive. Financial analysis with various statistical and financial tools has also been used for analysis aspect.

### **3.3 Sources of Data**

All the data necessary for the research will be collected from secondary sources. Data related to market prices of shares (MPS), market capitalization, movement of NEPSE index and etc will be taken from the trading report published by NEPSE, other relevant data will be collected from individual banks, Security Board of Nepal (Thapathali) and from their web sites.

The collection procedure is summarized below:

- Financial document and summary sheets provided by banks.
- Trading manual published by Nepal Stock Exchange Limited.
- Materials published in Newspapers and Magazines.
- Other related journals, periodicals, books and booklets.
- Central library T.U.

### **3.4 Population and Sample**

This study is based on the comparative study of risk and return on the basis of common stock investment of six commercial banks listed in Nepal Stock Exchange. Population is all the listed companies in NEPSE. Concentration of this study is listed commercial banks only. For this six commercial banks (SCBNL, NABIL, HBL, NIBL, BOK and Nepal SBI Bank) are selected.

### **3.5 Factors and Methods of Analysis**

The study employs various financial tools and statistical tools to analyze the data collected from various sources. Before, analysis, data will be presented in the tabular format, charts and graphs.

The collection data are analyzed by using various factors and financial as well as statistical tools which are given and defined below.

### **3.5.1 Factors of Data Analysis**

The factors that are used for analysis of risk and return are as follows:

#### **3.5.1.1 Market Price of Shares (MPS)**

Here in this study, each year closing price is taken as the market price of stock which has specific time span of one year and the study has focused in annual basis. To get the real average, volume and price of each transaction in the stock and duration of time of each transaction in the whole year are essential, which is tedious and impossible too, considering the data availability and maintenance.

Market value in the secondary market is determined by the supply and demand factors and reflects the opinion of investors and trader concerning the values of the stock closing price is used as market price of stock because it is very different to obtain and include these all information and average of high and low price may not be reliable and representative information.

#### **3.5.1.2 Dividend per Share (DPS)**

Dividend is the part of earning that is distributed to the share holders as a part of their investment. Dividend is return to equity capital that consist price of time and price of risk taking by the investors. The total amount of dividend out of earning available to the shareholder if distributed, the common stock's portion is said Dividend per share (DPS). Symbolically DPS can be expressed as follows:

$$\text{DPS} = \frac{\text{The Total Amount of Dividend Paid}}{\text{No. of Common Shares Outstanding}}$$

Dividend is relevant during computation of rate of return, which is reward to the shareholders for their investment, which can be given in different for, for investment, which can be given in different form. For instance cash dividend

and stock dividend etc. if company declares only cash dividend. There is no problem while taking the exact amount of dividend that is relevant. But if the company declares stock dividend (Bonus share), it is difficult to obtain the amount that really shareholders has gained. In this case, they get extra numbers of shares as dividend and simultaneously price of the stock declines as a result of increased number of stocks. To get a real amount of dividend following model has been used throughout.

Total Dividend in (Rs.)= Cash Dividend + % of Stock Dividend × MPS of ex-div. date

The various financial and statistical tools used are as follows:

### **3.5.2 Tools of Analysis**

#### **3.5.2.1 Financial Tools**

##### **1. Holding Period Return (HPR)**

Holding period return indicates the summation of price appreciation and dividend gain. Here price appreciation means gain on capital investment.

$$\text{HPR or Simple 'R'} = \frac{(P_t - P_{t-1}) + D_t}{P_{t-1}}$$

Where,

R = Annual rate of return

$P_t$  = Price of a stock at time t.

$P_{t-1}$  = Price of stock at time t-1.

$D_t$  = Cash dividend received at time t.

## 2. Return on Market ( $R_m$ )

It is the overall rate of return of the market, hence, of the NEPSE index. Market return is the average of individual return of the market.

$$R_m = \frac{\sum_{t=1}^n R_j}{n}$$

Where,

$\sum$  = sign of summation.

$R_m$  = Market return

$n$  = Number of samples period

## 3. Portfolio Risk and Return

Portfolio is combination of individual or a group of assets. Investors have different types of investment opportunity but they have limited resource for investment so that investors have to choose that investment opportunity which maximizes return for a given level of risk or minimize risk for a given level of return. Thus the combination of these investments is called portfolio.

### Portfolio Return:

The expected return on a portfolio is simply the weighted average of expected returns on the individual assets in the portfolio with weights being the fraction of the total portfolio invested in each asset.

$$E(R_P) = W_i E(R_i) + W_j E(R_j)$$

Where,

$E(R_P)$  = Expected return on portfolio.

$W_i$  = Proportion of wealth invested in  $i$  assets.

$W_j$  = Proportion of wealth invested in  $j$  assets.

$E(R_i)$  = Expected return on  $i$  assets.

$E(R_j)$  = Expected return on  $j$  assets.

### **Portfolio Risk:**

It is the combined standard deviation of individual stock return. It is the risk of individual securities plus covariance between the securities. It can be written as:

$$\sigma_p = \sqrt{\sigma_i^2 w_i^2 + \sigma_j^2 w_j^2 + 2w_i w_j \text{cov}(R_i, R_j)}$$

Where,

$\sigma_p$  = Standard deviation of stock i & J

$W_i$  = Proportion of asset i

$W_j$  = Proportion of assets j

$\sigma_i^2$  = Variance of assets i

$\sigma_j^2$  = Variance of assets j

$\text{cov}(R_i, R_j)$  = Covariance between the return of assets i & j

### **4. Portfolio Beta**

The beta of portfolio can be easily estimated by using beta of individual assets it includes. Symbolically, it is represented by:

$$\text{Portfolio beta } (b_p) = \sum_{j=1}^n W_j b_j$$

Where,

$W_j$  = proportion of the portfolio

$b_j$  = beta coefficient of asset j

$b_p$  = portfolio beta coefficient

### **5. Required Rate of Return**

Required rate of return is minimum expected rate of return needed to induce an investor to invest his/her fund. It is always more than risk less rate of return. Normally, when an individual investment is given higher return, i.e. realized rate of return then its required rate of return, this type of investment is known as under priced investment. Such under priced assets should be purchased. On

the other hand, if realized rate or return is less than required rate of return of a particular asset, it is said to be overpriced assets, such assets should be purchased, instead if one is holding such asset, it should be sold immediately. The required rate of return is calculated by using following formula.

$$E(R_j) = R_f + [E(R_m) - R_f]\beta_j$$

Where,

$E(R_j)$  = Required rate of return for stocks j

$R_f$  = Risk free rate

$E(R_m)$  = Expected return for market portfolio

$\beta_j$  = An index of systematic risk of stock j (beta coefficient)

### 3.5.2.2 Statistical Tools

#### 1. Expected Rate of Return:

One of the main aims of the study is to determine the expected return on the investment is CS. Expected rate or return is the arithmetic mean of the post years returns.

$$\bar{R}_j = \frac{\sum R_j}{n}$$

Where,

$\bar{R}_j$  = Expected rate or return on stock j.

n = Number of years that the return is taken.

$\sum$  = sign of summation.

#### 2. Standard Deviation

Standard deviation is a statistical measure and is widely used to measure risk from holding a single asset. It is also a statistical measure of the variability of a set of observations. The standard deviation represents a large dispersion of

return and is a high risk and vice versa. The symbol is called ( $\sigma$ ) sigma. It is the measure the total risk on stock investment.

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

If data is probability distribution

$$\text{Or, } \sigma_j = \sqrt{\sum_{t=1}^n [R_j - E(R_j)]^2 P_j}$$

Where,

$\sigma_j$  = Standard deviation on of return stock j during the time period

$P_j$  = Probability distribution of the observation.

$R_j$  = Probability distribution of the observation.

$E(R_j)$  = Expected rate or return on stock j.

$n$  = Number of years that the returns are taken.

### 3. Coefficient of Variation (C.V.)

It is the relative measurement of risk and return. It measures the risk per unit of return. It provides a more meaningful basis for comparison when the expected returns on two alternatives are not the same. The higher coefficient of variation, higher the risk.

$$\text{C.V.} = \frac{\sigma_j}{E(R_j)}$$

Where,

C.V. = Coefficient of variation of stock.

$\sigma_j$  = Standard deviation of return on stock j.

$E(R_j)$  = Expected rate of return on stock

#### 4. Beta Coefficient ( $\beta$ )

Beta coefficient shows the market sensitivity of stock. Higher the beta, higher the sensitivity and reaction to the market movement. Beta coefficient of a particular stock will be less than equal or more than 1, but the beta for market will be always 1.

$$\beta_j = \frac{\text{COV}(R_j, R_m)}{\sigma_m^2}$$

$$\text{COV}(R_j, R_m) = \frac{\sum [R_j - E(R_j)][R_m - E(R_m)]}{n-1}$$

Where,

$\beta_j$  = Beta coefficient of stock j.

$\text{COV}(R_j, R_m)$  = Covariance between return on stock j and return on market.

$\sigma_m^2$  = Variance of market return.

#### 5. Correlation Coefficient

The change in the value of one variable is accompanied by change in the value of other then there is correlation between two variables. Correlation may be positive or negative. If return on two securities is negatively correlated which combined in portfolio reduces the risk. If securities are positively correlated risk cannot be reduced.

Correlation coefficient measures the relationship between two variables in quantitative terms. Correlation coefficient always lies in the range of +1 to -1. A positive correlation coefficient indicates that the returns from two securities generally move in the same direction and vice versa.

Correlation coefficient and covariance are related by the following equation.

$$\text{Cov}_{ij} = \sigma_i \sigma_j \rho_{ij}$$

$$\rho_{ij} = \frac{\text{Cov}_{ij}}{\sigma_i \sigma_j}$$

Where,

$\sigma_i$  and  $\sigma_j$  are the standard deviations of returns for assets i and j and  $\rho_{ij}$  is correlation coefficient for asset i and j. there are various cases of correlation and risk condition which are presented below.

**i) Perfectly Positive Correlation ( $\rho_{ij} = +1$ )**

Return on two perfectly positive correlated stocks would move up and down together and a portfolio of two such stocks would be exactly as risk if the portfolio consists of perfectly positive correlated stocks.

**ii) Perfectly Negative Correlation ( $\rho_{ij} = -1$ )**

Returns on two perfectly negative correlated stock would move perfectly together put in exactly opposite in directions. In this condition, risk can be completely eliminated perfect negative correlation almost never found in the real world.

**iii) No Relation between Return ( $\rho_{ij} = 0$ )**

When the correlation between two stocks is exactly zero, there is no relationship between the return they are independent of each other. In this condition some risk can be reduced.

**iv) Intermediate Risk ( $\rho_{ij} = +0.5$ )**

Most of the stocks are positively correlated but not perfectly. On average the returns on two stocks would lie on the range of +0.4 and +0.75 under this

condition combining stock into portfolio reduced risk but not eliminate it completely.

### **3.6 Methods of Analysis and Presentation**

All the methods of analysis and presentation are applied as simple as possible. Proper financial and statistical tools are used and results are presented in table and also shown in diagram. Interpretation is made in very simple way detail of calculation which cannot be shown in the main body part, are presented in appendices at the end, summary, conclusion and recommendation are presented finally.

## CHAPTER IV

### DATA ANALYSIS AND MAJOR FINDINGS

#### 4.1 Data Presentation and Analysis

This chapter including analysis of data collected and their presentation. In this chapter the effort has been made to analyze. “Risk and return analysis on the basis of common stock investment of commercial banks; with reference to 6 commercial banks.” Detailed data of MPS and dividend of each and sector, NEPSE index of each sector and market is presented and their interpretation and analysis is done. With reference to the various readings and literature review in the previous chapter, effort is made to diagnose and analyze the recent Nepalese stock market movement with taking a special reference to listed commercial banks. Different tables and figures are drawn to make the result more simple and understandable.

In this study the analysis is based on the secondary data that is presented in this way.

- Expected return
- Standard deviation
- Coefficient of variation
- Analysis of Market sensitivity
- Analysis of portfolio

##### 4.1.1 Analysis of Individual Commercial Banks

As the study has been taken special reference to listed commercial banks, common stock of listed commercial banks is analyzed individually. There are thirty two commercial banks and all are in operation till to date. Among them only commercial bank are as sample of study. Each company is introduced and their common stock risk and return are analyzed and interpreted here. Name of the selected six commercial banks are as follows:

- Standard Chartered Bank Nepal Limited (SCBNL)
- Nepal Arab Bank Limited (NABIL)
- Bank of Kathmandu Limited (BOKL)
- Himalayan Bank Limited (HBL)
- Nepal SBI Bank Limited
- Nepal Investment Bank Limited (NIBL)

#### 4.1.1.1 Standard Chartered Bank Nepal Limited (SCBNL)

This bank which is formerly Nepal Grindlays Bank was established in joint investment. It was established in 1985 as foreign joint venture bank under the company act 1965. 2000 the Nepal Grindlays Bank was amalgamate in standard chartered banking group and the 50% share of former was transferred to the latter by the virtue of amalgamation 33.34% of equity share capital was held by Nepal Bank Limited and remaining 16.66% share capital is held by general public investors. The bank has been providing various banking services to its customers through branches nationwide. The bank listed in the NEPSE in 2045 B.S. Its central office is at New Baneshwor, Kathmandu. Bank's Market capitalization is RS 56,011,180,640.00 and total paid-up capital is RS 931,966,400.00 with 9,319,664 shares.

**Table 4.1**

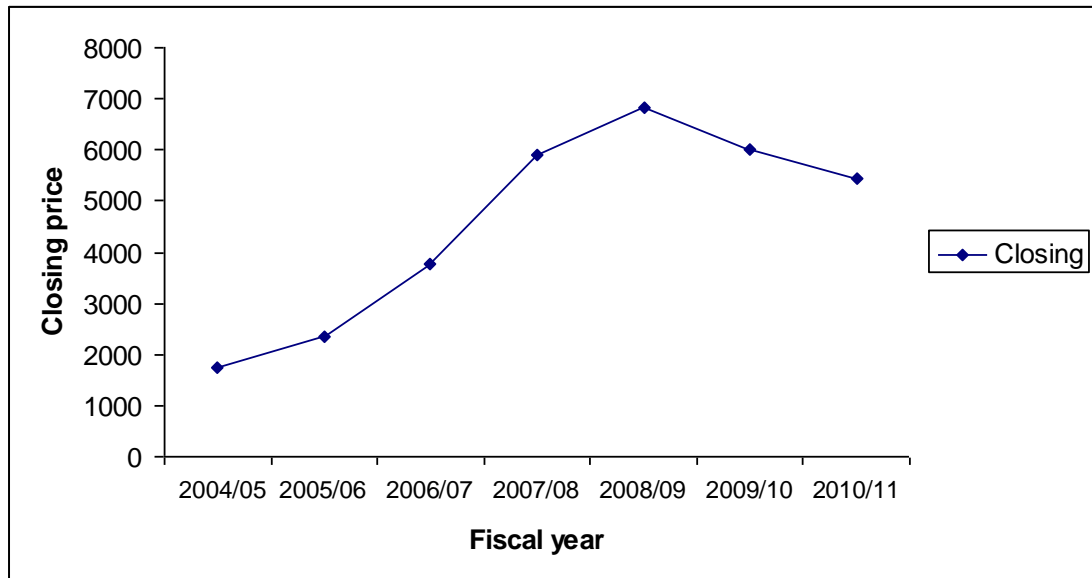
#### **MPS and DPS of Common Stocks of SCBNL**

| Fiscal Year | Market Price Per Share |      |         | Cash Dividend | Stock Dividend | Total Dividend |
|-------------|------------------------|------|---------|---------------|----------------|----------------|
|             | High                   | Low  | Closing |               |                |                |
| 2004/05     | 2350                   | 1553 | 2345    | 120           | -              | 120            |
| 2005/06     | 3775                   | 2200 | 3775    | 130           | 10             | 720            |
| 2006/07     | 5900                   | 3058 | 5900    | 80            | 50             | 3495           |
| 2007/08     | 9025                   | 4505 | 6830    | 80            | 50             | 3085           |
| 2008/09     | 6050                   | 6010 | 6010    | 50            | 50             | 2765           |
| 2009/10     | 5500                   | 3279 | 5430    | 55            | 15             | 325            |
| 20010/11    | 3214                   | 1280 | 1800    | 50            | -              | 50             |

Source: Appendix I

**Diagram 4.1**

**Year End Market Price Movement of the Common Stock of SCBNL**



From the diagram 4.1, it can be concluded that movement of price of shares of SCBNL is in increasing trends from 2004/05 to 2008/09. It was 2345 during FY 2004/05 and reached till 6010 during the FY 2008/09. But the share price declined during the FY 2010/11 and reached 1800. It is because of global financial crisis which is being faced by all the countries.

**Table 4.2**

**Statistical Analysis is of Common Stock of SCBNL**

| Fiscal Year | Year End Price | Dividend | $R = \frac{(p_t - p_{t-1}) + D_t}{P_{t-1}}$ | R-E(R <sub>j</sub> ) | [R-E(R <sub>j</sub> )] <sup>2</sup>           |
|-------------|----------------|----------|---|----------------------|---|
| 2004/05     | 2345           | 120      | -   | -                    | -   |
| 2005/06     | 3775           | 720      | 0.9168                                      | 0.4710               | 0.2218  |
| 2006/07     | 5900           | 3495     | 1.4887                                      | 1.0438               | 1.0895  |
| 2007/08     | 6830           | 3085     | 0.6805                                      | 0.2356               | 0.0555  |
| 2008/09     | 6010           | 2765     | 0.2848                                      | -0.1600              | 0.0256  |
| 2009/10     | 5430           | 325      | -0.0424                                     | -0.4873              | 0.2374  |
| 2010/11     | 1800           | 50       | -0.6595                                     | -1.1041              | 1.2191  |
| Total       |                |          | ΣR = 2.6691                                 |                      | Σ[R-E(R <sub>j</sub> )] <sup>2</sup> = 2.8233 |

Source: Appendix II

Here from the table 4.2 we can see that the risk and return of SCBNL is 75.14% and 44.49% respectively. The coefficient of the variation is 1.6890 which means for earning 1 unit of return the investor has to bear 01.6890 units of risk.

#### **4.1.1.2 Nepal Arab Bank Ltd. (NABIL)**

Nepal Arab Bank Ltd (NABIL) is the first joint venture commercial bank in Nepal which is the joint venture of Nepali promoters and Emirates Bank International (Dubai) in 1984 under the company act 1996. Now its 50% equity share is hold by Emirates Bank international, 20% equity share hold by Nepali promoters and financial institutions and remaining 30% were issued to general public of Nepal. Market Capitalization of this bank is Rs 47,311,945,530.00 and its total paid up capital is Rs 965,747,000.00 with 9,657,470 numbers of shares.

**Table 4.3**  
**MPS and DPS of Common Stocks of NABIL**

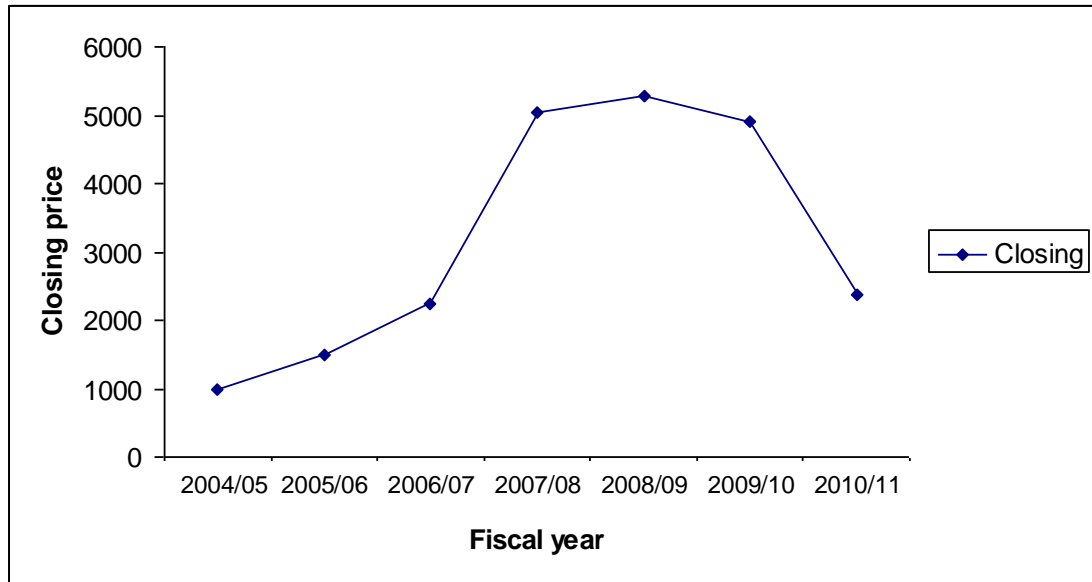
| Fiscal Year | Market Price Per Share |      |         | Cash Dividend | Stock Dividend | Total Dividend |
|-------------|------------------------|------|---------|---------------|----------------|----------------|
|             | High                   | Low  | Closing |               |                |                |
| 2004/05     | 1005                   | 705  | 1000    | 65            | -              | 65             |
| 2005/06     | 1515                   | 1000 | 1505    | 70            | -              | 70             |
| 2006/07     | 2300                   | 1500 | 2240    | 85            | -              | 85             |
| 2007/08     | 5050                   | 2025 | 5050    | 100           | 40             | 2210           |
| 2008/09     | 6700                   | 3410 | 5275    | 60            | 40             | 2019.60        |
| 2009/10     | 4920                   | 4880 | 4899    | 35            | 50             | 1227           |
| 2010/11     | 2415                   | 2360 | 2384    | 30            | 30             | 405.6          |

Source: Appendix I

The table 4.3 shows that market price per share of NABIL is in increasing trend from FY 2004/05 till 2008/09 whereas it declined in FY 2010/11 and reached 2384. Whereas total dividend paid by the bank in each year has increased since FY 2004/05 till 2008/09.

**Diagram 4.2**

**Year End Market Price Movement of the Common Stock of NABIL**



From the diagram 4.2 it is clear that the price of common stock of NABIL has increased efficiently during the FY year 2007/08 i.e. 5050 whereas during the FY 2008/09 there is only slight increase in closing price i.e. 5275 and at the end of the FY 2009/10 the closing price started to decline and reached 2384.

**Table 4.4**

**Statistical Analysis of Common Stock of NABIL**

| Fiscal Year | Year End Price | Dividend | $R = \frac{(p_t - p_{t-1}) + D_t}{P_{t-1}}$ | R-E(R <sub>j</sub> ) | [R-E(R <sub>j</sub> )] <sup>2</sup>             |
|-------------|----------------|----------|---|----------------------|---|
| 2004/05     | 1000           | 65       | -   | -                    | -   |
| 2005/06     | 1505           | 70       | 0.5750                                      | -0.0144              | 0.000736  |
| 2006/07     | 2240           | 85       | 0.5449                                      | -0.0445              | 0.009803  |
| 2007/08     | 5050           | 2210     | 2.2411                                      | 1.6517               | 2.7281  |
| 2008/09     | 5275           | 2019.60  | 0.4445                                      | -0.1449              | 0.02099   |
| 2009/10     | 4899           | 1227     | 0.1613                                      | -0.4281              | 0.1833  |
| 2010/11     | 2384           | 405.6    | -0.4306                                     | -1.02                | 1.0404  |
| Total       |                |          | ΣR = 3.5362                                 |                      | Σ[R-E(R <sub>j</sub> )] <sup>2</sup><br>= 3.983 |

Source: Appendix II

Here, from table 4.4 we can see that the risk and return of NABIL is 89.25% and 58.94% respectively. The coefficient of the variation is 1.514, which means for earning 1 unit of return the investor has to bear 1.514 units of risk.

#### 4.1.1.3 Bank of Kathmandu (BOKL)

Bank of Kathmandu Ltd. Was established in 1994 under joint investment of SIAM commercial Bank, Thailand and Nepali promoters. Market capitalization of this bank is Rs 14,776,963,250.00 and total paid up capital is Rs 844,397,900.00 with 8443,979 numbers of shares.

**Table 4.5**  
**MPS and DPS of Common Stocks of BOKL**

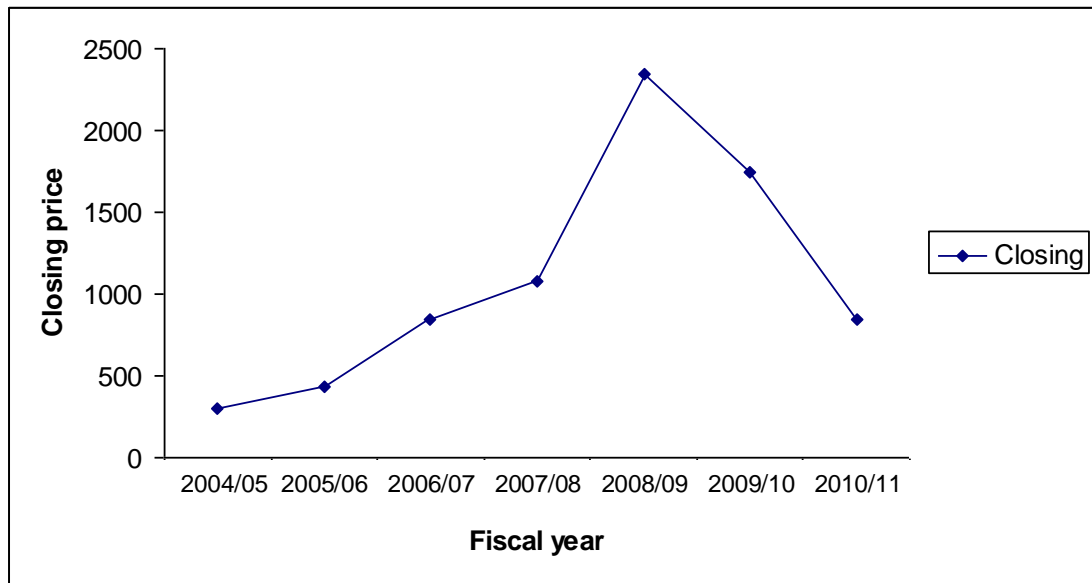
| Fiscal Year | Market Price Per Share |      |         | Cash Dividend | Stock Dividend | Total Dividend |
|-------------|------------------------|------|---------|---------------|----------------|----------------|
|             | High                   | Low  | Closing |               |                |                |
| 2004/05     | 310                    | 175  | 295     | 10            | -              | 10             |
| 2005/06     | 472                    | 280  | 430     | 15            | -              | 15             |
| 2006/07     | 881                    | 422  | 850     | 18            | 30             | 340.50         |
| 2007/08     | 1375                   | 691  | 1075    | 20            | -              | 20             |
| 2008/09     | 2361                   | 1200 | 2350    | 2.1053        | 40             | 702.11         |
| 2009/10     | 1835                   | 1750 | 1750    | 7.37          | 40             | 343.37         |
| 2010/11     | 925                    | 815  | 840     | 15            | 15             | 100.5          |

Source: Appendix I

Table 4.5 shows that since FY 2004/05 market price per share of BOKL is in increasing trend till 2008/09. The market price has doubled during FY 2008/09 than during FY 2007/08 whereas during FY 2010/11 the market price declined to 840. The total dividend distributed by the bank has also increased from FY 2004/05 till 2008/09 but decreased during 2010/11.

**Diagram 4.3**

**Year End Market Price Movement of the Common Stock of BOKL**



From the diagram 4.3 it is clear that the price of common stock of BOKL has increased efficiently during the FY year 2004/05 till FY 2008/09. The closing price of stock during FY 2004/05 is 295 and reached 2350 during 2008/09. Whereas the closing price at the end of the FY 2010/11 started to declined and reached 840 which is due to global crisis all over.

**Table 4.6**

**Statistical Analysis of Common Stock of BOKL**

| Fiscal Year | Year End Price | Dividend | $R = \frac{(p_t - p_{t-1}) + D_t}{P_{t-1}}$ | R-E(R <sub>j</sub> ) | [R-E(R <sub>j</sub> )] <sup>2</sup> |
|-------------|----------------|----------|---|----------------------|-------------------------------------|
| 2004/05     | 295            | 10       | -   | -                    | -                                   |
| 2005/06     | 430            | 15       | 0.5085                                      | -0.1302              | 0.01695                             |
| 2006/07     | 850            | 340.50   | 1.7686                                      | 1.1299               | 1.2767                              |
| 2007/08     | 1075           | 20       | 0.2882                                      | -0.3515              | 0.1229                              |
| 2008/09     | 2350           | 702.11   | 1.8392                                      | 1.2005               | 1.4412                              |
| 2009/10     | 1750           | 343.37   | -0.1092                                     | -0.7479              | 0.5534                              |
| 2010/11     | 840            | 100.5    | -0.463                                      | -1.1017              | 1.214                               |
| Total       |                |          | $\Sigma R = 3.8323$                         |                      | $\Sigma [R-E(R_j)]^2 = 4.6312$      |

Source: Appendix II.

Here, from table 4.6 we can see that the risk and return of BOKL 96.24% and 63.87% respectively. The coefficient of the variation is 1.5068 which means for earning 1 unit of return the investor has to bear 1.5068 units of risk.

#### 4.1.1.4 Himalayan Bank Limited (HBL)

Himalayan Bank Ltd is a joint venture bank with Habib Bank Ltd. of Pakistan established in 1992 under the company act 1964. This is the first joint venture bank managed by Nepali Chief Executive. The operation of the bank started from February 1993. Bank's Market Capitalization is Rs. 21,405,384,000.00 and total paid up capital is Rs. 1,216,215,000.00 with 12162150 numbers of shares. The main objectives of the bank is to provide modern banking facilities like tale banking to the businessmen, industrialists, other professional and to provide loans on agriculture and industrial sectors. Now it 20% equity share is hold by Habib Bank and 80% equity share is hold by Nepali promoter, financial institutions, general public and others. Following table 4.7 represents the market price and dividend purchase of HBL for the purpose of risk and return analysis.

**Table 4.7**  
**MPS and DPS of Common Stocks of HBL**

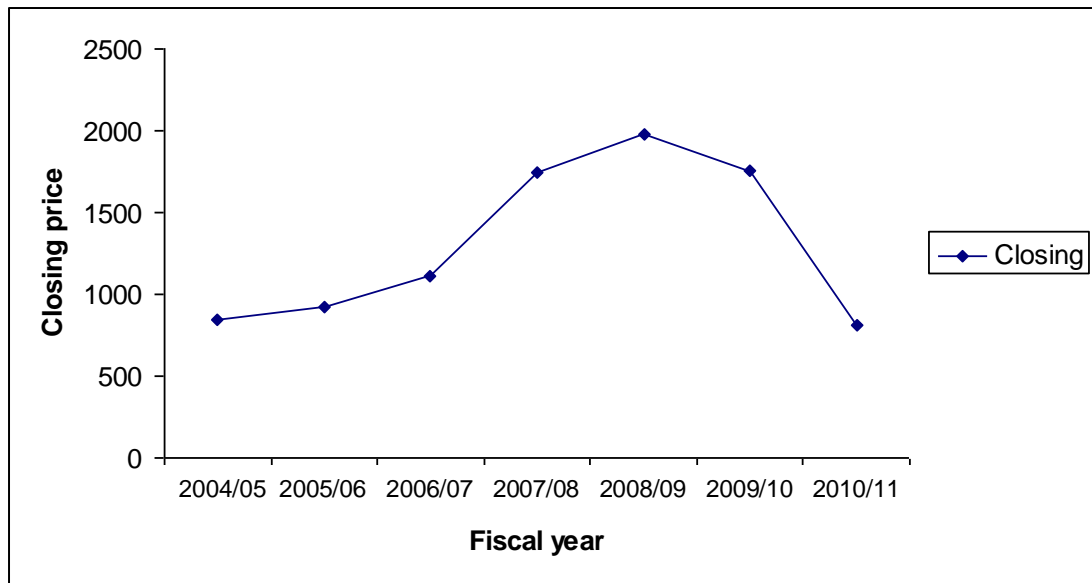
| Fiscal Year | Market Price Per Share |      |         | Cash Dividend | Stock Dividend | Total Dividend |
|-------------|------------------------|------|---------|---------------|----------------|----------------|
|             | High                   | Low  | Closing |               |                |                |
| 2004/05     | 1010                   | 600  | 840     | -             | 20             | 184            |
| 2005/06     | 1181                   | 855  | 920     | 11.58         | 20             | 233.58         |
| 2006/07     | 1110                   | 950  | 1110    | 30            | 5              | 117            |
| 2007/08     | 1740                   | 1575 | 1740    | 15            | 25             | 510            |
| 2008/09     | 1980                   | 1980 | 1980    | 25            | 20             | 377            |
| 2009/10     | 1887                   | 1760 | 1760    | 12            | 31.56          | 269.53         |
| 2010/11     | 890                    | 816  | 816     | 11.84         | 25             | 155.6          |

Source: Appendix I

Table 4.7 shows the market price per share of HBL has increased from FY 2004/05 till 2008/09 and started declining in FY 2009/10. This is due to global crisis and over. In FY 2007/08 HBL has distributed the highest dividend i.e. 510 and during FY 2006/07 HBL distributed least dividend i.e. 117.

**Diagram 4.4**

**Year End Market Price Movement of the Common Stock of HBL**



From the diagram 4.4 it is clear that the price of common stock of HBL has increased gradually since 2004/05 but started declining in FY 2009/10.

**Table 4.8**

**Statistical Analysis of Common Stock of HBL**

| Fiscal Year | Year End Price | Dividend | $R = \frac{(p_t - p_{t-1}) + D_t}{P_{t-1}}$ | R-E(R <sub>j</sub> ) | [R-E(R <sub>j</sub> )] <sup>2</sup> |
|-------------|----------------|----------|---|----------------------|-------------------------------------|
| 2004/05     | 840            | 184      | -   | -                    | -                                   |
| 2005/06     | 920            | 233.58   | 0.3733                                      | 0.957                | 0.009506                            |
| 2006/07     | 1110           | 117      | 0.3337                                      | 0.0561               | 0.00315                             |
| 2007/08     | 1740           | 510      | 1.0270                                      | 0.7494               | 0.5616                              |
| 2008/09     | 1980           | 377      | 0.3546                                      | 0.007                | 0.00049                             |
| 2009/10     | 1760           | 269.53   | 0.0250                                      | -0.2526              | 0.0638                              |
| 2010/11     | 816            | 155.6    | -0.4479                                     | -0.7255              | 0.5264                              |
| Total       |                |          | $\Sigma R = 1.6657$                         |                      | $\Sigma [R-E(R_j)]^2 = 1.1649$      |

Source: Appendix II

Here, from table 4.8 we can see that the risk and return of HBL is 33.91% and 44.48% respectively. The coefficient of the variation is 1.738, which means for earning 1 unit of return the investor has to bear 1.738 units of risk.

#### 4.1.1.5 Nepal SBI Bank Ltd.

Nepal SBI Bank Ltd is another joint venture of State Bank of India and a Nepali promoter which was registered under the company act 1964 in 1993. The bank is managed by State Bank of India under joint venture and technical services agreement signed between them and Nepali promoters vice, employees provident fund and Agriculture Development Bank Nepal. The main objective of the bank is to carryout modern banking business in the country under commercial bank act 1974. The state bank of India is holding 50.60% equity and 49.40% equity is hold by Nepal promoters, general public investors and others. The bank's Market capitalization is Rs 16,596,102,900.00 and total paid up capital is Rs 873,479,100.00 with 8734791 numbers of shares.

**Table 4.9**

#### **MPS and DPS of Common Stocks of Nepal SBI Bank**

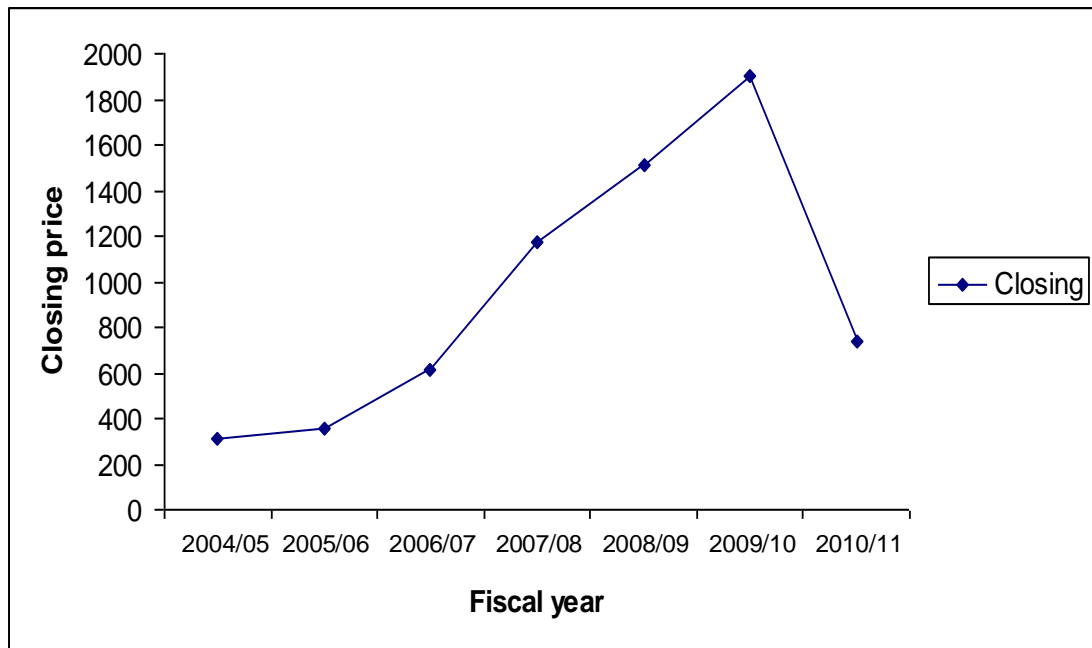
| Fiscal Year | Market Price Per Share |      |         | Cash     | Stock    | Total    |
|-------------|------------------------|------|---------|----------|----------|----------|
|             | High                   | Low  | Closing | Dividend | Dividend | Dividend |
| 2004/05     | 307                    | 231  | 307     | -        | -        | -        |
| 2005/06     | 480                    | 315  | 355     | -        | -        | -        |
| 2006/07     | 689                    | 335  | 612     | 5        | 5        | 63.80    |
| 2007/08     | 1176                   | 505  | 1176    | 12.59    | 47.59    | 731.675  |
| 2008/09     | 1612                   | 1000 | 1511    | -        | -        | -        |
| 2009/10     | 1938                   | 1900 | 1900    | 2.11     | 42.11    | 314.45   |
| 2010/11     | 1255                   | 715  | 741     | 5        | 17.50    | 103.88   |

Source: Appendix I

Unlike other bank's common stock MPS and DPS of common stocks of Nepal SBI Bank is in increasing trend since 2004/05 till 2009/10. The bank has

highest MPS during FY 2009/10 i.e. 1900 and least MPS during FY 2004/05 i.e. 307. During the FY 2009/10 it distributed total dividend of 760.09 to its shareholders.

**Diagram 4.5**  
**Year End Market Price Movement of the Common Stock of Nepal SBI Bank**



The diagram 4.5 shows that Market price of the stock of Nepal SBI Bank has increased efficiently since FY 2004/05 till date. During FY 2004/05 the closing price of Nepal SBI Bank was 307 Since Then it's price stated increasing and reached 1900 during the FY 2009/10. There after it decreases in 2010/11 to Rs 741.

**Table 4.10****Statistical Analysis of Common Stock of Nepal SBI Bank**

| Fiscal Year | Year End Price | Dividend | $R = \frac{(p_t - p_{t-1}) + D_t}{P_{t-1}}$ | R-E(R <sub>j</sub> ) | [R-E(R <sub>j</sub> )] <sup>2</sup>              |
|-------------|----------------|----------|---|----------------------|--|
| 2004/05     | 307            | -        | -   | -                    | -  |
| 2005/06     | 355            | -        | 0.1564                                      | -0.4056              | 0.1645   |
| 2006/07     | 612            | 63.80    | 0.9037                                      | 0.3417               | 0.1168   |
| 2007/08     | 1176           | 731.675  | 2.1171                                      | 1.555                | 2.418  |
| 2008/09     | 1511           | -        | 0.2849                                      | -0.2771              | 0.0768   |
| 2009/10     | 1900           | 314.15   | 0.4654                                      | -0.0966              | 0.00933  |
| 2010/11     | 741            | 103.88   | -0.5553                                     | -1.1173              | 1.2484   |
| Total       |                |          | ΣR = 3.3722                                 |                      | Σ[R-E(R <sub>j</sub> )] <sup>2</sup><br>= 40.338 |

Source: Appendix II

Here from table 4.10 we can see that the risk and return of Nepal SBI Bank Ltd is 89.82% and 56.20% respectively. The coefficient of the variation is 1.5982 which means for earning 1 unit of return the investor has to bear 1.5982 units of risk.

#### 4.1.1.6 Nepal Investment Bank Ltd. (NIBL)

Previous Nepal Indosuez Bank Ltd. is known as Nepal investment Bank now. It is another joint venture bank established on 21<sup>st</sup> January 1986 under the company Act 1964. Now this bank is operating under the full ownership of Nepalese promoters and shareholders. Market capitalization of this bank is 33, 410, 116, 332, 00 and total paid up capital is 2,407,068,900.00 with 24071689 numbers of shares

**Table 4.11**

**MPS and DPS of Common Stocks of NABIL**

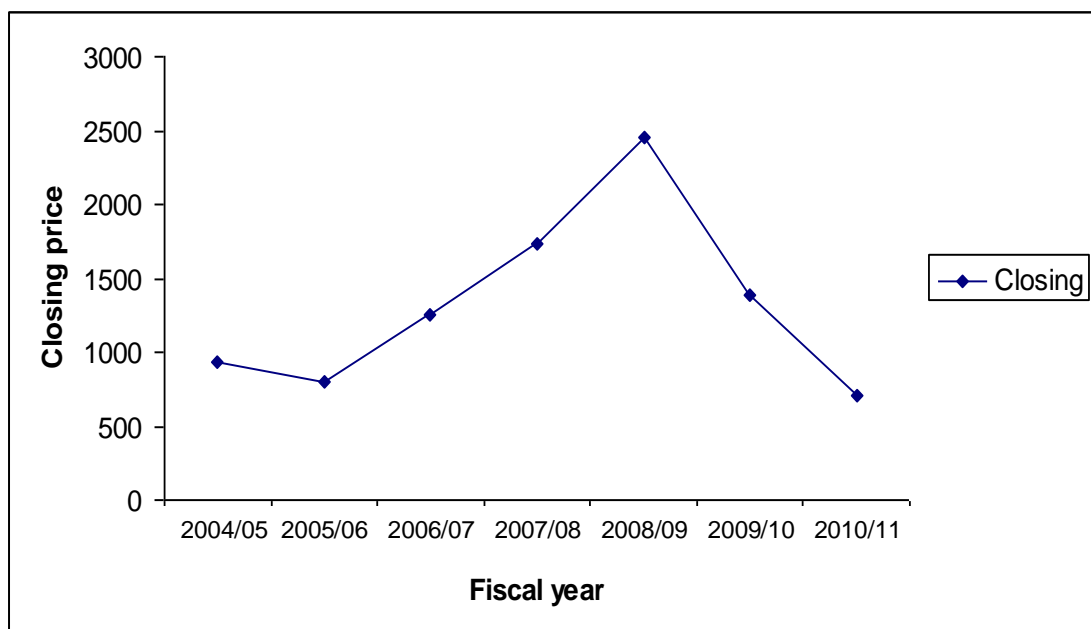
| Fiscal Year | Market Price Per Share |      |         | Cash Dividend | Stock Dividend | Total Dividend |
|-------------|------------------------|------|---------|---------------|----------------|----------------|
|             | High                   | Low  | Closing |               |                |                |
| 2004/05     | 942                    | 745  | 940     | 15            | -              | 15             |
| 2005/06     | 1430                   | 760  | 800     | 12.50         | -              | 12.50          |
| 2006/07     | 1265                   | 762  | 1260    | 20            | 35.46          | 633.103        |
| 2007/08     | 1729                   | 1000 | 1729    | 5             | 25             | 617.50         |
| 2008/09     | 3101                   | 1305 | 2450    | 7.5           | 33.33          | 470.12         |
| 2009/10     | 1406                   | 1350 | 1388    | 20            | -              | 20             |
| 2010/11     | 1235                   | 700  | 705     | 25            | 25             | 25             |

Source: Appendix I

NABIL has least MPS during FY 2010/11 i.e. 705 and highest during FY 2008/09 i.e. 2450. But during FY 2010/11 Market price per share of NIBL declined to 705. Table 4.11 shows that NIBL has distributed highest dividend to its shareholders during FY 2006/07 and distributed least dividend during FY 2005/06 i.e. 12.50.

**Diagram 4.6**

**Year End Market Price Movement of the Common Stock of NIBL**



According to year end market price of share, the market price of the shares of NIBL is high in FY 2008/09 and very low in price of NIBL increased efficiently but after 2008/09 market price started declining.

**Table 4.12****Statistical Analysis of Common Stock of NIBL**

| Fiscal Year | Year End Price | Dividend | $R = \frac{(p_t - p_{t-1}) + D_t}{P_{t-1}}$ | R-E(R <sub>j</sub> ) | [R-E(R <sub>j</sub> )] <sup>2</sup>              |
|-------------|----------------|----------|---|----------------------|--|
| 2004/05     | 940            | 15.00    | -   | -                    | -  |
| 2005/06     | 800            | 12.50    | -0.1356                                     | -0.4494              | 0.2019   |
| 2006/07     | 1260           | 633.103  | 1.3664                                      | 1.0526               | 1.1079   |
| 2007/08     | 1729           | 617.50   | 0.8623                                      | 0.5485               | 0.30085  |
| 2008/09     | 2450           | 470.12   | 0.6889                                      | 0.3751               | 0.1407   |
| 2009/10     | 1388           | 20.00    | -0.4253                                     | -0.7391              | 0.5463   |
| 2010/11     | 705            | 25.00    | -0.4741                                     | -0.7879              | 0.6201   |
| Total       |                |          | ΣR = 1.8826                                 |                      | Σ[R-E(R <sub>j</sub> )] <sup>2</sup><br>= 2.9178 |

Source: Appendix II

Here, from table 4.12 we can see that the risk and return of NIBL is 76.39% and 31.38% respectively. The coefficient of the variation is 2.4359, which means for earning 1 unit of return the investor has to bear 2.4359 units of risk.

## 4.2 Comparative Analysis of Obtained Results

### 4.2.1 Inter Bank Comparisons

The result from previous section (4.1) is presented here in a tabular, graphical form. From the year 2004/05 to 2010/11.

**Table 4.13****Expected Return, S.D. and Coefficient of Variation of each Bank**

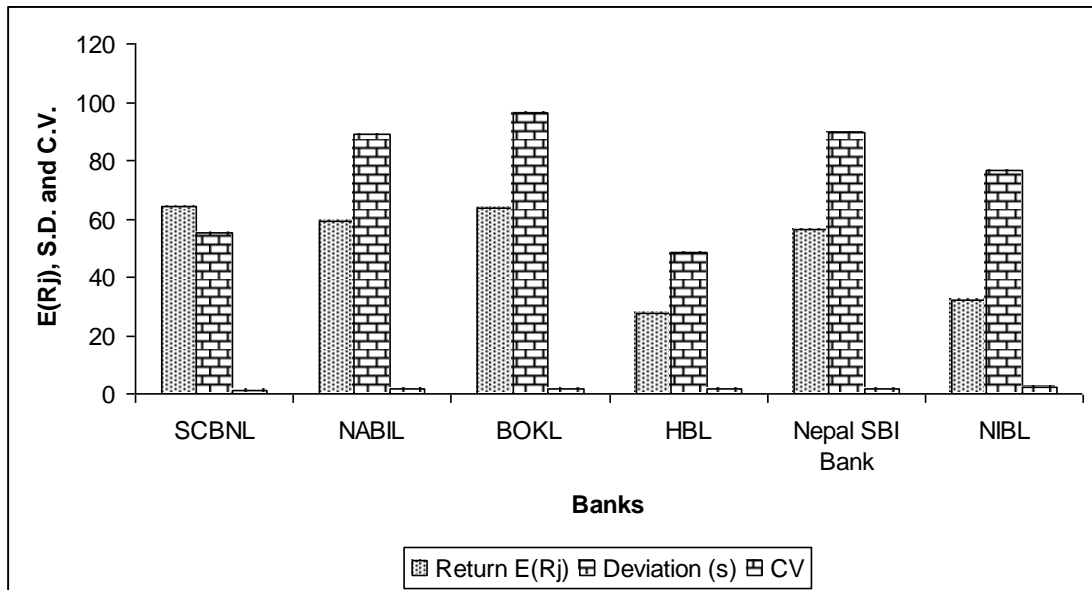
| Banks             | Return<br>E(R <sub>j</sub> ) | Deviation<br>(σ) | CV     | E (R <sub>j</sub> ) | σ       | CV      |
|-------------------|------------------------------|------------------|--------|---------------------|---------|---------|
| SCBNL             | 44.49                        | 75.14            | 1.6890 |                     |         |         |
| NABIL             | 58.94                        | 89.25            | 1.514  |                     |         |         |
| BOKL              | 63.87                        | 96.24            | 1.5068 | Highest             | Highest | Lowest  |
| HBL               | 27.76                        | 48.27            | 1.738  | Lowest              | Lowest  |         |
| Nepal SBI<br>Bank | 56.20                        | 89.82            | 1.5982 |                     |         |         |
| NIBL              | 31.88                        | 76.39            | 2.4319 |                     |         | Highest |

Source: Appendix II

The table 4.13 shows that investors can get the highest return for investment in common stocks of Bank of Kathmandu Limited and lowest return form investment in common stocks of Himalayan Bank Limited. Bank of Kathmandu has the highest and Himalayan Bank Limited has the lowest standard deviation. But coefficient of variation is best way to make investment decision is common stock when two or more investment has different return and different risk. Coefficient of variation measures the risk per unit. Nepal Investment Bank Limited has highest and Standard Chartered Bank has lower C.V. the comparison can easily understandable from the diagram 4.7 presented below:

**Diagram 4.7**

**Year End Market Price Movement of the Common Stock of NIBL**



**4.2.2 Comparison of Selected Commercial Banks on the Basis of Market Capitalization**

Market Capitalization is the total value at specific period of time. The market capitalization of listed securities of the six commercial banks at the end of the fiscal year 2010/11 is presented below.

**Table 4.14**

**Market Capitalization of Selected Banks**

**(Rs. In Millions)**

| S.N   | Commercial Banks | Market Capitalization | Percentage |
|-------|------------------|-----------------------|------------|
| 1.    | SCBNL            | 56011.18              | 29.54      |
| 2.    | NABIL            | 47311.95              | 24.97      |
| 3.    | BOKL             | 14776.96              | 7.80       |
| 4.    | HBL              | 21405.38              | 11.30      |
| 5.    | Nepal SBI Bank   | 16596.10              | 8.76       |
| 6.    | NIBL             | 33410.12              | 17.63      |
| Total |                  | 189511.69             | 100        |

Source: Refer annual trading report 2010/11 NEPSE

**Figure 4.8**

**Market Capitalization of Selected Banks**

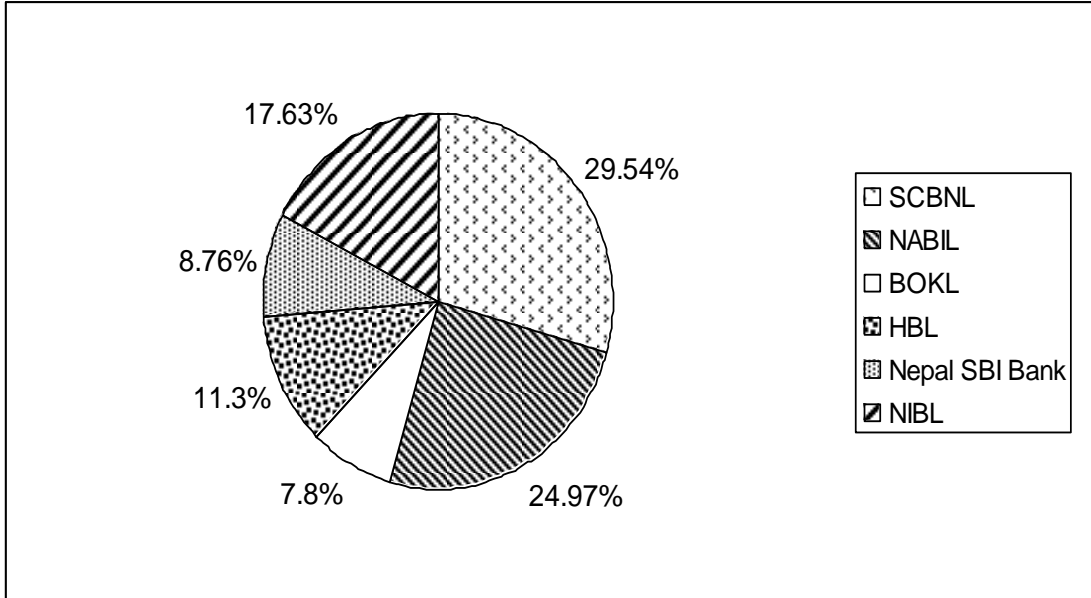


Table 4.13 shows the market capitalization of selected commercial banks at the end of the fiscal year 2010/11. The market capitalization of SCBNL is highest by 29.54% and the market capitalization of BOKL is low by 7.80%.

**4.2.3 Analysis of Market Risk and Return**

Nepal Stock Exchange Limited (NEPSE) is only the stock market of Nepal. Hence, NEPSE index represents the overall market movement. Market Risk and Return is determined on the basis of year end NEPSE index.

Realized return, expected return, standard Deviation and coefficient of the variation of Market Index and summarized below.

**Table 4.15****Realized Return, Expected Return, Standard Deviation and Coefficient of Variation of Market Index**

| Fiscal Year | Year end index | R <sub>m</sub>                 | R <sub>m</sub> – E(R <sub>m</sub> ) | [R <sub>m</sub> -E(R <sub>m</sub> )] <sup>2</sup>              |
|-------------|----------------|--------------------------------|-------------------------------------|--|
| 2004/05     | 222.04         | -                              | -                                   | -  |
| 2005/06     | 286.67         | 0.2911                         | 0.0957                              | 0.009158   |
| 2006/07     | 386.83         | 0.3494                         | 0.154                               | 0.02372  |
| 2007/08     | 683.95         | 0.7681                         | 0.5727                              | 0.3279   |
| 2008/09     | 963.36         | 0.4085                         | 0.2131                              | 0.04541  |
| 2009/10     | 749.10         | -0.2224                        | -0.4178                             | 0.1746   |
| 2010/11     | 477.73         | -0.4223                        | -0.6177                             | 0.3816   |
| Total       |                | E(R <sub>m</sub> ) =<br>1.5947 |                                     | ∑[R <sub>m</sub> -E(R <sub>m</sub> )] <sup>2</sup> =<br>0.9624 |

Source: Appendix II

The expected rate of return on overall market is 19.54% by the end of the FY 2010/11. The NEPSE index is highest in the fiscal year 2008/09 and lowest in the fiscal year 2004/05. After 2008/09 i.e. during FY 2010/11 due to decrease in share transaction NEPSE index decline to 477.73 forms 963.36. This can be clear from the diagram below.

### 4.3 Comparison of Sample banks with Market

#### 4.3.1 Standard Chartered Bank Nepal Limited (SCBNL)

Table 4.16

##### Summary of Risk and Return for SCBNL and Market

| Statistics                                    | SCBNL  | Market |
|---|--------|--------|
| Expected Return E ( $R_j$ )                   | 0.4449 | 0.1954 |
| Variance ( $\sigma^2$ )                       | 0.3077 | 0.1925 |
| Standard Deviation ( $\sigma$ )               | 0.7514 | 0.4387 |
| Coefficient of Variation (C.V)                | 1.6890 | 2.2451 |
| Systematic risk( $\beta^2\sigma_m^2$ )        | 0.2126 | -      |
| Unsystematic risk( $e^2$ )                    | 0.0951 | -      |
| Beta( $\beta$ ) = Index of Systematic risk    | 1.051  | 1      |
| Alpha( $\alpha$ )                             | 0.4381 | -      |
| Correlation with market( $\rho$ )             | 0.8313 | -      |
| Proportion of Systematic risk( $\rho^2$ )     | 0.6910 | -      |
| Proportion of Unsystematic risk( $1-\rho^2$ ) | 0.309  | -      |

Data Source: Appendix II and III

SCBNL's common stocks expected return is higher than the market return  $44.49 > 19.54$  which means SCBNL's Stock return 3.2932 times higher than the market return. This is due to paying of higher dividend by this bank. SCBNL's common stock's standard deviation is also higher than the market standard deviation (i.e.  $0.7514 > 0.4387$ ).

Coefficient of variation is better measure of risk because it measures per unit risk. Coefficient of Variation of SCBNL is less than coefficient of variation of market (i.e.  $1.6890 < 2.2451$ ) which means common stock of SCBNL has less risk per unit than nth market price.

Beta coefficient of SCBNL is 1.051 based on the yearly returns during FY 2004/05 to 2010/11. A beta of 1.051 ( $\beta > 1$ ) means that SCBNL's return is more volatile than the market return.

The intercept is 0.4381. It shows that the SCBNL's return is 0.4381 when market return is zero. Expected return of SCBNL is 0.4381 times when the market earns nothing. If the yearly market return is expected to be 1 percent, expected yearly return of SCBNL is  $R = \alpha + \beta R_m$

$$= 0.4381 + 1.051 \times 0.1954$$

$$= 0.6435$$

$$= 64.35\%$$

The correlation of SCBNL with market is 0.8313. The positive correlation indicates that if the market (NEPSE) return goes up, return of SCBNL also goes up or vice versa. The coefficient of determination or proportion of systematic risk is 0.6909. It indicates the percentage of the variance of SCBNL's return explained by the change in the market return. So it is called the systematic (market) risk and therefore, it is un-diversifiable. The 0.309 ( $1 - \rho^2$ ) residual variance is specific risk of these firms. It is called unsystematic risk and it is diversifiable.

#### 4.3.2 NABIL Bank Limited

**Table 4.17**

**Summary of Risk and Return for NABIL and Market**

| Statistics                                       | NABIL   | Market |
|--|---------|--------|
| Expected Return E ( $R_j$ )                      | 0.5894  | 0.1954 |
| Variance ( $\sigma^2$ )                          | 0.7966  | 0.1925 |
| Standard Deviation ( $\sigma$ )                  | 0.5894  | 0.4387 |
| Coefficient of Variation (C.V)                   | 1.514   | 2.2451 |
| Systematic risk ( $\beta^2 \sigma_m^2$ )         | 0.61197 | -      |
| Unsystematic risk ( $e^2$ )                      | 0.1846  | -      |
| Beta ( $\beta$ ) = Index of Systematic risk      | 1.783   | 1      |
| Alpha ( $\alpha$ )                               | 0.2410  | -      |
| Correlation with market ( $\rho$ )               | 0.8765  | -      |
| Proportion of Systematic risk ( $\rho^2$ )       | 0.7683  | -      |
| Proportion of Unsystematic risk ( $1 - \rho^2$ ) | 0.2317  | -      |

Data Source: Appendix II and IV

Expected return of NABIL bank is higher than the market return which means common stock of NABIL bank's expected return is 3.0164 times higher than the market return. Standard deviation of NABIL bank is also higher than the standard deviation of market, which means total risk on return of NABIL bank is 1.3435 times riskier than the market return on common stock.

Coefficient of variation is better measure of risk because it measures per unit risk. Coefficient of Variation of NABIL is less than coefficient of variation of market (i.e.  $1.514 < 2.2451$  which means common stock of NABIL has less risk per unit than the market price.

Beta coefficient of NABIL is 1.782 based on the yearly returns during FY 2004/05 to 2010/11. A beta 1.783 ( $\beta > 1$ ) means that NABIL's return is more volatile than the market return.

The intercept is 0.2410. It shows the return of NABIL bank when market return is zero. Expected return of NABIL 0.2410 times when the market earns nothing.

The correlation of NABIL with market 0.8765. The positive correlation indicates that if the market (NEPSE) return goes up, return of NABIL also goes up or vice versa. The coefficient of determination or proportion of systematic risk is 0.7683. It indicates the percentage of the variance of NABIL's return explained by the change in the market return. So it is called the systematic (market) risk and therefore, it is un-diversifiable. The 0.2317 ( $1 - \rho^2$ ) residual variance specific risk of these firms. It is called unsystematic risk and it is diversifiable.

### 4.3.3 Bank of Kathmandu Limited (BOKL)

**Table 4.18**

**Summary of Risk and Return of BOKL and Market**

| Statistics                                    | BOKL    | Market |
|---|---------|--------|
| Expected Return E ( $R_j$ )                   | 0.6387  | 0.1654 |
| Variance ( $\sigma^2$ )                       | 0.9262  | 0.1925 |
| Standard Deviation ( $\sigma$ )               | 0.9624  | 0.4387 |
| Coefficient of Variation (C.V)                | 1.5068  | 2.2451 |
| Systematic risk( $\beta^2\sigma_m^2$ )        | 0.3040  | -      |
| Unsystematic risk( $e^2$ )                    | 0.62224 | -      |
| Beta( $\beta$ ) = Index of Systematic risk    | 1.2567  | 1      |
| Alpha( $\alpha$ )                             | 0.3931  | -      |
| Correlation with market( $\rho$ )             | 0.5729  | -      |
| Proportion of Systematic risk( $\rho^2$ )     | 0.3283  | -      |
| Proportion of Unsystematic risk( $1-\rho^2$ ) | 0.6713  | -      |

Data Source; Appendix III and V.

Expected return on common stock of BOKL is higher than the market return which means BOKL's expected return is 3.2687 times higher than the market return. Standard deviation of BOKL is also higher than the standard deviation of market, which means total risk on return of BOKL is 2.1938 times riskier than the market return on common stock.

Coefficient of variation of BOKL is less than coefficient of variation of market (i.e.  $1.5268 < 2.2451$ ) which means common stock of BOKL has less risk per unit than the market price.

Beta coefficient of BOKL is 1.2567 based on the yearly returns during FY 2004/05 to 2009/11. A beta of 1.2567 means that BOKL's return is more volatile than the market return.

The intercept is 0.3931. It shows the return of BOKL when market return is zero. Expected return of BOKL is 0.3921 times when the market earns nothing.

The correlation of BOKL with market is 0.5729. The positive correlation indicates that if the market (NEPSE) return goes up, return of BOKIL also goes up or vice versa. The coefficient of determination or proportion of systematic risk is 0.3283. It indicates the percentage of the variance of BOKL's return explained by the change in the market return. So is called the systematic (market) risk and therefore, it is un-diversifiable. The 0.6717 ( $1 - \rho^2$ ) residual variance is specific risk of these firms. It is called unsystematic risk and it is diversifiable.

#### 4.3.4 Himalayan Bank Limited (HBL)

**Table 4.19**  
**Summary of Risk and Return of HBL and Market**

| Statistics                                    | HBL     | Market |
|---|---------|--------|
| Expected Return E ( $R_j$ )                   | 0.2776  | 0.1954 |
| Variance ( $\sigma^2$ )                       | 0.23298 | 0.1925 |
| Standard Deviation ( $\sigma$ )               | 0.4827  | 0.4387 |
| Coefficient of Variation (C.V)                | 1.738   | 2.2451 |
| Systematic risk( $\beta^2\sigma_m^2$ )        | 0.20865 | -      |
| Unsystematic risk( $e^2$ )                    | 0.02433 | -      |
| Beta( $\beta$ ) = Index of Systematic risk    | 1.0441  | 1      |
| Alpha( $\alpha$ )                             | 0.07417 | -      |
| Correlation with market( $\rho$ )             | 0.9464  | -      |
| Proportion of Systematic risk( $\rho^2$ )     | 0.8956  | -      |
| Proportion of Unsystematic risk( $1-\rho^2$ ) | 0.1044  | -      |

Data Source: Appendix II and VI.

Expected return on common stock of HBL is higher than the market return which means HBL's expected return is 1.4207 times higher than the market

return. Standard deviation of HBL higher than the standard deviation of market (i.e.  $0.4827 > 0.4387$ ), which means total risk on return of HBL's stock is more riskier than that of market return.

Coefficient of variation is better measure of risk because it measures per unit risk. Coefficient of Variation of HBL is less than coefficient of variation of market (i.e.  $1.738 < 2.2451$ ) which means common stock of BHL has less risk per unit than the market price.

Beta coefficient of HBL is 1.0441 based on the yearly return during FY 2004/05 to 2010/11. A beta of 1.0441 ( $\beta > 1$ ) means that HBL's return is more volatile than the market return.

The intercept is 0.07417. It shows the return of HBL when market return is zero. Expected return of HBL is 0.7417 times when the market earns nothing.

The correlation of HBL with market is 0.9464. The positive correlation indicates that if the market (NEPSE) return goes up, return of HBL also goes up or vice versa. The coefficient of determination or proportion of systematic risk is 0.8956. It indicates the percentage of the variance of HBL's return explained by the change in the market return. So it is called the systematic (market) risk and therefore, it is un-diversifiable.

The 0.1044 (1-2) residual variance is specific risk of these firms. It is called unsystematic risk and it is diversifiable.

### 4.3.5 Nepal SBI Bank Ltd

**Table 4.20**

**Summary of Risk and Return for Nepal SBI Bank Ltd. and Market**

| Statistics                                    | Nepal SBI Bank Ltd. | Market |
|---|---------------------|--------|
| Expected Return E ( $R_j$ )                   | 0.5620              | 0.1954 |
| Variance ( $\sigma^2$ )                       | 0.8068              | 0.1925 |
| Standard Deviation ( $\sigma$ )               | 0.8982              | 0.4387 |
| Coefficient of Variation (C.V)                | 1.5982              | 2.2451 |
| Systematic risk( $\beta^2\sigma_m^2$ )        | 0.5160              | -      |
| Unsystematic risk( $e^2$ )                    | 0.2908              | -      |
| Beta( $\beta$ ) = Index of Systematic risk    | 1.6373              | 1      |
| Alpha( $\alpha$ )                             | 0.2421              | -      |
| Correlation with market( $\rho$ )             | 0.7997              | -      |
| Proportion of Systematic risk( $\rho^2$ )     | 0.6393              | -      |
| Proportion of Unsystematic risk( $1-\rho^2$ ) | 0.3604              | -      |

Data Source: Appendix II and III.

Expected return on common stock of Nepal SBI Bank is higher than the market return which means Nepal SBI Bank's expected return is 2.8762 times higher than the standard deviation of market, which means total risk of return on common stock of Nepal SBI Bank is more riskier than that of market return.

Coefficient of variation is better measure of risk because it measures per unit risk. Coefficient of variation of Nepal SBI Bank is less than coefficient of variation of market (i.e.  $1.5982 < 2.2451$ ) which means common stock of Nepal SBI Bank has less risk per unit than the market price.

Beta coefficient of Nepal SBI Bank is 1.6373 based on the yearly returns during FY 2004/05 to 2010/11. A beta of 1.6373. The positive correlation indicates that if the market (NEPSE) return goes up, return of Nepal SBI Bank

also goes up or vice versa. The coefficient of determination or proportion of systematic risk is 0.6393. It indicates the percentage of the variance of Nepal SBI Bank's return explained by the change in the market return. So it is called the systematic (market) risk and therefore, it is un-diversifiable.

The 0.3604 ( $1-\rho^2$ ) residual variance is specific risk of these firms. It is called unsystematic risk and it is diversifiable.

#### 4.3.6 Nepal Investment Bank Ltd. (NIBL)

**Table 4.21**  
**Summary of Risk and Return for NIBL and Market**

| Statistics                                    | NIBL   | Market |
|---|--------|--------|
| Expected Return E ( $R_j$ )                   | 0.3138 | 0.1954 |
| Variance ( $\sigma^2$ )                       | 0.5836 | 0.1925 |
| Standard Deviation ( $\sigma$ )               | 0.7639 | 0.4387 |
| Coefficient of Variation (C.V)                | 2.4359 | 2.2451 |
| Systematic risk( $\beta^2\sigma_m^2$ )        | 0.3558 | -      |
| Unsystematic risk( $e^2$ )                    | 0.2278 | -      |
| Beta( $\beta$ ) = Index of Systematic risk    | 1.3595 | 1      |
| Alpha( $\alpha$ )                             | 0.0482 | -      |
| Correlation with market( $\rho$ )             | 0.7808 | -      |
| Proportion of Systematic risk( $\rho^2$ )     | 0.6097 | -      |
| Proportion of Unsystematic risk( $1-\rho^2$ ) | 0.3903 | -      |

Data Source: Appendix II and VIII

Expected return on common stock of NIBL is higher than the market return which means NIBL expected return is 1.6059 times higher than the market return. Standard deviation of NIBL is higher than the standard deviation of market, which means total risk of return on common stock of NIBL is higher

than the standard deviation of market, which means total risk of return on common stock of NIBL is more riskier than that of market return.

Coefficient of variation is better measure of risk because it measures per unit risk. Coefficient of variation of NIBL is more than coefficient of variation of market (i.e.  $2.435 > 2.2451$  which means common stock of NIBL has more risk per unit than the market price.

Beta coefficient of NIBL is 1.3595 based on the yearly returns during FY 2004/05 to 2010/11. A beta of 1.3595 ( $\beta > 1$ ) means that NIBL's return is more volatile than the market return.

The intercept is 0.0482. It shows the return of NIBL when market return is zero. Expected return of NIBL is 0.0482 times when the market earns nothing.

The correlation of NIBL with market is 0.7808. The positive correlation indicates that if the market (NEPSE) return goes up, return of NIBL also goes up or vice versa. The coefficient of determination or proportion of systematic risk is 0.6097. It indicates the percentage of the variance of NIBL's return explained by the change in the market return. So it is called the systematic (market) risk and therefore, it is un-diversifiable.

The 0.3903 (1-2) residual variance is specific risk of these firms. It is called unsystematic risk and it is diversifiable.

**Table 4.22****Summary of Risk and Return for Sample**

| Statistics                                       | SCBNL  | NABIL   | BOKL   | HBL     | Nepal<br>SBI<br>Bank | NIBL   |
|--|--------|---------|--------|---------|----------------------|--------|
| Expected Return E (R <sub>j</sub> )              | 0.4449 | 0.5894  | 0.6387 | 0.2776  | 0.5620               | 0.3138 |
| Variance ( $\sigma^2$ )                          | 0.3077 | 0.7967  | 0.9262 | 0.2329  | 0.8068               | 0.5836 |
| Standard Deviation ( $\sigma$ )                  | 0.7514 | 0.8925  | 0.9624 | 0.4827  | 0.8982               | 0.7639 |
| Coefficient of Variation<br>(C.V)                | 1.6890 | 1.514   | 1.5068 | 1.738   | 1.5982               | 2.4359 |
| Systematic risk( $\beta^2\sigma_m^2$ )           | 0.2126 | 0.61197 | 0.3040 | 0.2087  | 0.5160               | 0.3558 |
| Unsystematic risk( $e^2$ )                       | 0.0951 | 0.1846  | 0.6222 | 0.0243  | 0.2908               | 0.2278 |
| Beta( $\beta$ ) = Index of<br>Systematic risk    | 1.051  | 1.783   | 1.2567 | 1.0411  | 1.6373               | 1.3595 |
| Alpha( $\alpha$ )                                | 0.4381 | 0.2410  | 0.3931 | 0.07417 | 0.24221              | 0.0482 |
| Correlation with market( $\rho$ )                | 0.8313 | 0.8765  | 0.5729 | 0.9464  | 0.7997               | 0.7808 |
| Proportion of Systematic<br>risk( $\rho^2$ )     | 0.6909 | 0.7683  | 0.3283 | 0.8956  | 0.6396               | 0.6097 |
| Proportion of Unsystematic<br>risk( $1-\rho^2$ ) | 0.309  | 0.2317  | 0.6717 | 0.1044  | 0.3604               | 0.3903 |

Data Source: Table 4.15 to Table 4.20

#### 4.4 Price Evaluation of Selected Banks

CAPM is model that assumes stock's required rate of return is equal to the risk free rate plus its risk premium where risk is measured by the beta coefficient. Beta coefficient play vital role in CAPM approach. If the required rate of return is less than expected rate of return, the stock is said to be under priced and if the required rate of return is more than the expected rate of return the stock is said to be over priced. For this analysis the risk free rate of return is needed, which is taken from the interest rate of return is more than the expected rate of

return the stock is said to be over priced. For this analysis the risk free rate of return is needed, which is taken from the interest rate of Treasury bill issued by Nepal Rastra Bank. NRB issued Treasury bill, 91 days and 364 days time duration. Table 4.22 shows the required rate of return, expected rate of return and price evaluation. 91 days duration Treasury bill rate is taken as risk free rate which is approximately 5.98 percent in April 2010.

**Table 4.23**

**Calculation of Required Rate of Return (RRR), Expected Rate of Return (ERR) and Price Evaluation of each Stock by CAPM Model**

| Banks          | Beta   | $(RRR)=R_f+[E(R_m)-R_f]\beta$ | E(Ri)  | Price Situation |
|----------------|--------|-------------------------------|--------|-----------------|
| SCBNL          | 1.051  | 0.2023                        | 0.4449 | Under priced    |
| NABIL          | 1.783  | 0.3016                        | 0.5894 | Under priced    |
| BOKL           | 1.2567 | 0.2302                        | 0.6387 | Under priced    |
| HBL            | 1.0411 | 0.20097                       | 0.2776 | Under priced    |
| Nepal SBI Bank | 1.6373 | 0.2818                        | 0.5620 | Under priced    |
| NIBL           | 1.3595 | 0.2447                        | 0.3138 | Under priced    |

Data Source: table 4.21 and Appendix II

The stocks of all six commercial banks are under priced as their required rate of return is less than the expected rate of return. The chances of increase in value of under priced stock in future is high so investors should buy these stocks so that they can gain higher return in future.

#### **4.5 Portfolio Analysis**

Portfolio is a combination of more than two types of assets for the investment. The portfolio would be able to reduce unsystematic or diversifiable risk. It is the random selection of securities that are to be added to a portfolio. It reduces a portfolio's total diversifiable risk to zero. In previous topic and headings the analysis is simply a weighted average of the expected return of the securities comprising that portfolio that those weights are equal to the proportion

of total fund invested in each security. Portfolio is a group of assets compiled to minimize the risk on investment. To invest in single security is risky, but to give relatively safe if hold in a portfolio. The major objective of portfolio analysis is to suggest the assets for investment that stabilized the earnings and minimize the risk. It helps to minimize the chance of loss from the change in stock price. Therefore, we need to extend our analysis of risk and return to portfolio context. Here, we are going to analyze the portfolio. The analysis is based on four assets portfolio and the tools for analysis are described in the Research Methodology in chapter-3.

To analyze the four assets portfolios among the six commercial banks, at first equal proportion of capital should be invested in common stock of each commercial bank i.e. 16.67% weight in each common stock. Here, common stock of six selected sample commercial banks are taken to construct the four assets portfolio.

#### 4.6 Analysis of Average/Pooled Six Simple Commercial banks

**Table 4.24**

**Average Return of Six Commercial banks**

| Banks          | Fiscal Year/Return |         |         |         |         |         | Total  |
|----------------|--------------------|---------|---------|---------|---------|---------|--------|
|                | 2005/06            | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 |        |
| SCBNL          | 0.9168             | 1.4887  | 0.6805  | 0.2848  | -0.0424 | -0.6593 |        |
| NABIL          | 0.5750             | 0.5449  | 2.2411  | 0.4445  | 0.1613  | -0.4306 |        |
| BOKL           | 0.5085             | 1.7686  | 0.2882  | 1.8392  | -0.1092 | -0.463  |        |
| HBL            | 0.3733             | 0.3337  | 1.0270  | 0.3546  | 0.0250  | -0.4479 |        |
| Nepal SBI Bank | 0.1564             | 0.9037  | 2.1171  | 0.2849  | 0.4654  | -0.5553 |        |
| NIBL           | -0.1356            | 1.3664  | 0.8623  | 0.6889  | -0.4253 | -0.4741 |        |
| Total          | 1.8902             | 5.8341  | 8.0244  | 4.2926  | 0.402   | -2.2935 |        |
| Average        | 0.3150             | 0.9724  | 1.3374  | 0.7154  | 0.067   | -0.3823 | 3.0249 |

Data Source: Appendix II

From table 4.24 it is clear that average return of six commercial banks during the FY 2005/06 is 0.3150. The average return of six commercial banks is highest during the FY 2007/08 i.e. 1.3374 and lowest during the FY 2010/11 i.e. -0.3823.

**Table 4.25**

**Statistical Analysis of Common Stock of Six Commercial Banks**

| Investment                      | Expected Return | Standard Deviation | Coefficient of Variation |
|---------------------------------|-----------------|--------------------|--------------------------|
| Average of six commercial banks | 50.42%          | 0.6278             | 1.2451                   |

Data Source: Appendix II

The table 4.25 clearly states that the average expected return of six commercial bank sis 50.42% are risk associated with this return is 62.78%.

Whether the expected return of portfolio is 50.54% which is approximately equal with average expected return, the portfolio risk associated with this return is 45.32% which is less than the risk associated with the average expected return.

**4.7 Portfolio Analysis is Each Two Assets among Selected Assets**

As assuming before, proportion investment in each two assets is equal to 50% of capital to minimize the risk.

Therefore, portfolio analysis in each two assets among selected assets are shown in Table 4.28 below:

**Table 4.28****Portfolio Return & Risk in each Two Assets**

| Assets                         | Portfolio Return | Portfolio Risk |
|--------------------------------|------------------|----------------|
| A&B (SCBNL & NABIL)            | 61.65            |                |
| B&C (NABIL & BOKL)             | 61.41            |                |
| C&D (BOKL & HBL)               | 45.82            |                |
| D&E (HBL & Nepal SBI Bank)     | 41.98            |                |
| E&F (Nepal SBI Bank & NIBL)    | 43.79            |                |
| F&A (NIBL & SCBNL)             | 47.87            |                |
| A&C (SCBNL & BOKL)             | 64.11            |                |
| A&D (SCBNL & HBL)              | 46.06            |                |
| A&E (SCBNL & Nepal SBI Bank)   | 60.28            |                |
| B & D (NABIL & HBL)            | 43.35            |                |
| B & E (NABIL & Nepal SBI Bank) | 57.57            |                |
| B & F (NABIL & NIBL)           | 45.16            |                |
| C & E (BOKL & Nepal SBI Bank)  | 60.04            |                |
| C & F (BOKL & NIBL)            | 47.63            |                |
| D & F (HBL & NIBL)             | 29.57            |                |

Data Source: Appendix X to XI

Here, the portfolio return of SCBNL and BOKL is maximum by 64.11% and HBL and NIBL is minimum by 29.57%. Similarly, the portfolio risk of NABIL and Nepal SBI Bank is maximum by 88.25% and portfolio risk of SCBNL and HBL is minimum by 49.79%.

#### **4.8 Major Findings**

Major findings of the above calculation are presented as follows.

1. Among 31 commercial banks, 18 commercial banks are listed in NEPSE. Among the listed commercial banks, only six commercial banks i.e. SCBNL, NABIL, BOKL, HBL, Nepal SBI bank and NIBL

are taken into consideration. The Expected return of six commercial banks is 44.49%, 58.94%, 63.87%, 27.76%, 56.20% and 31.38% respectively.

2. Standard deviation of SCBNL, NABIL, BOKL, HBL, Nepal SBI bank and NIBL is 75.14%, 898.25%, 96.24%, 48.27%, 89.82% and 76.39%. Standard deviation of BOKL is maximum by 96.24% and standard deviation HBL is minimum by 48.27%.
3. On the basis of coefficient of variation, the coefficient of variation of SCBNL, NABIL, BOKL, HBL, Nepal SBI Bank and NIBL is 1.6890, 1.514, 1.5068, 1.738, 1.5982 and 2.4359. It is clear that investment in common stock of NIBL is highly risky whereas investment in stock of SCBNL is less risky.
4. Sector wise NEPSE index is in increasing trend form 2004/05 to 2008/09 whereas it started declining in the FY 2009/10. So, considering Market risk and return expected return of overall market from fiscal year 2004/05 to 2010/11 is 19.54% and the risk associated with expected return is 43.87% and the coefficient of variation is 2.451 units. Her risk is higher than return.
5. The beta coefficient of SCBNL, NABIL, BONL, HBL, Nepal SBI bank and NIBL is 1.051, 1.783, 1.2567, 1.0411, 1.6373 and 1.3595 respectively. It proves that the common stock of NABIL bank is most aggressive and the common stock of SCBNL is least aggressive so it is better to invest in common stock of SCBNL because the beta coefficient indicates systematic rise of the assets.
6. Considering market capitalization of six commercial banks the market capitalization is SCBNL, NABIL, BOKL, HBL, Nepal SBI bank and NIBL is 29.54%, 24.97%, 7.80%, 11.30%, 8.76% and 17.63% respectively in the year 2009/10. The market capitalization of SCBNL is

maximum by 29.54% and the market capitalization of BOKL is minimum by 7.80%.

7. On the basis of required rate of return and expected rate of return the study shows RRR of SCBNL, NABIL, BOKL, HBL, Nepal SBI Bank and NIBL is 0.2023.
8. The average expected return of common stock of six sample commercial banks is 50.42% and the risk associated with this return is 62.78%. On the basis of Portfolio analysis, six assets portfolio is constructed and the portfolio return is 50.54% which is approximately equal to average expected return, but the portfolio risk associated with the return is 45.32%.
9. The portfolio return of SCBNL and BOKL is maximum by 64.11% and HBL and NIBL is minimum by 29.57%. Similarly, the portfolio risk of NABIL and Nepal SBI Bank is maximum by 76.58% and portfolio risk of SCBNL and HBL is minimum by 49.79%

## CHAPTER V

### SUMMARY, CONCLUSIONS AND RECOMMENDATION

#### 5.1 Summary

Financial analysis consists of the acquisition, utilization, control and administration of funds. Managerial finance and investment analysis are an exciting and dynamic area of study and its importance to long run success of today's business is unquestioned.

Return is fundamental requirement of investment and a certain level of risk is attached with it. Saving is worthless until and unless used in productive investment. Finance mostly deals with the monetary risk and return which is the most influencing subject matter for a individual and to small and large corporations as well. Past trend shows that the field of finance is gradually improving and it has truly undergoes a revolution and it is no of the leading sectors. Stock market has become a global phenomenon.

Generally, investors invest their current cash only to those areas where there is high return and low risk. And the investor looking for the common stock investment usually pays the price for the stock based on his estimation about future dividends and grown in stock price. This study occupies an important role in the development of stock market. Besides commercial bank, development banks are investing their performance in Nepalese banking sector.

Lack of information and lean knowledge is chief problem faced by individual investor who are manipulated and exploited by eh financial institutions and their market intermediaries. The attitude and perception of investors play chief role in investment decision which is influenced by the information and access to the data requir4ed for analysis. Investor invests their wealth on the basis of guess and hunches because they do not have any information about the financial access and they also lack the idea to reach to in deal investment

decision. Investor purchase stocks merely looking past trend of stock prices and sometimes they have to bear heavy loss due to inadequate knowledge and information related to the stock investment. Investors expect favorable return by holding stock.

Since the main objective of the study is to analyze the risk and return of common stocks in Nepalese context. The study is focused on the common stock of listed commercial banks. Thus listed six commercial banks are taken as sample to analyze the risk and return on common stock investment. While analyzing the risk and return, brief review of related studies has been performed. The analysis of risk and return is significant in investment decision as well as managerial decision. It influences risk and return of the shareholders. Consequently the risk and return analysis influences the market price of stock. So before making an investment decision, a person must analyzed the risk and return form particular stock as well as they can make a good risk minimizing portfolio between their investments in the stock. While analyzing the risk and return brief review of related studies has been performed. Scientific methods are used in data analysis and tables, graphs and diagrams are used to present the data are findings clearly. Both quantitative and qualitative analysis has been performed by using statistical tools as well as personal judgment. Secondary data are collected from the NEPSE, annual and quarterly publication of NRB, SEBON and from other individual commercial banks.

## **5.2 Conclusion**

This study enables investors to put the returns they can expect and the risk they may take into better perspective because most of the people considered stock market investment as a black art that they have unrealistically optimistic or pessimistic expectations about stock market investments or perhaps a far of the unknown. Nepalese stock market is in emerging stage and its development is accelerating since the political change in 2046 B.S. which is the effect of open economy and liberalization in national economy. But, Nepalese individual

investors cannot analyze the securities as well as market properly because of lack of information and poor knowledge about the analysis of securities investment. Following are the major conclusion summarized.

1. The return is the income received on common stock investment, which is usually expressed in percentage. Among selected six commercial banks expected return on the common stock of BOKL is maximum (i.e. 63.87%) and expected return on the common stock of HBL is minimum by 27.76%.
2. Risk is associated with return and it is variability of returns which is measured in terms of standard deviation, common stock of BOKL is most risky, since it has the highest standard deviation i.e. 96.24% and common stock of HBL is least risky because its standard deviation is 48.27%.
3. On the other hand, coefficient of variation is more rational basis of investment decision which measures the risk per unit of variation, common stock of BOKL is best among all selected commercial banks. BOKL has 1.5068 unit of risk per unit of return. Whereas common stock of NIBL has highest risk considering per unit return (i.e. 2.4359 units).
4. Standard deviation measures unsystematic risk which is not defined by the market. Another aspect of the risk is systematic risk which is defined by the market and measured by beta coefficient. Beta coefficient measures the sensitivity or volatility of the stock with the market.
5. Capital assets pricing model (CAPM) describes the relationship between risk and required rate of return. Summation of risk free rate ( $R_f$ ) and premium based in the systematic risk of the security is required rate of return of the common stock. Comparison between required rate of return (RRR) and expected rate of return (ERR) helps to predict whether the stock is overpriced or under priced. IF the required rate of return is

greater than expected rate of return, the price of stock is overpriced and vice versa. The study shows that the common stocks of all selected commercial banks are underpriced. All the stocks are in demand and investors can buy the stock of all the six commercial banks.

6. It can be concluded that the diversification of fund by making a portfolio can reduce unsystematic risk of individual security significantly. If investors select the securities for investment, which has highly negative correlations of return, the risk can be reduced totally. If the correlation between the return of two stocks is highly positive, risk reduction is not too significant. So, portfolio between the common stock of same industry cannot reduce risk properly. In this study portfolio investment has less risk (i.e. 45.32%) than average risk of six assets (i.e. 62.78%) whereas the average return and portfolio return is approximately equal.
7. Among six selected commercial banks if investors invest in each two assets they will get good result in their investment.

### **5.3 Recommendations**

The focus of the study is to assess risk associated with return on common stock considering individual and private investors. The following factors are recommended on the basis of data analysis and major findings of this study.

1. Proper analysis of individual security industry and overall market is always essential to make possible to consumer the stock market. General knowledge about economic, political as well as technological trend will be advantageous which is proved by the present political situation of Nepal, it cause a great deterioration in share price. To win in the market, sell shares when market is rising and buy when the market is declining and hold shares which will perform better than market.

2. Among the six selected commercial banks it is recommended to shareholders to invest in common of BOKL because its coefficient of variation is minimum i.e. 1.5068
3. Investors need to diversify their fund to reduce risk. Proper construction of portfolio will reduce considerable potential loss, which can be defined in terms of risk. For the portfolio construction select the stock that have higher return with low risk and stock from different industries. This study suggests that similar stock cannot diversify the risk properly and some risk can be reduced by investing in constructing rather than investing in single/individual assets. So the construction of portfolio among the common stock of six assets i.e. SCBNL, NABIL, BOKL, HBL, Nepal SBI Bank and NIBNL is recommended due to more expected rate of return with less risk.
4. Analysis of personal risk attitude, needs and requirements will be helpful before making an investment decision in stock market. Investors should make several discussions with stockholders before reaching at any conclusions. Investors should make their decision on the basis of reliable information rather than the imagination and rumors.
5. Before making investment decision, it is recommended to visit and discuss with investment companies, with individual expert and researchers. In case of Nepal NCM mutual fund is worthwhile for people. So, sharing experience, idea and view of experts will provide greater help.
6. Organized bodies like SEBON and NEPSE should hold meeting and gathering about common stock investment in Nepalese financial as well as other markets. By making seminars and meetings, it is fruitful for investors to know about 'Trading System' of Nepal. NEPSE is following 'open out and cry system' of trading even in the age of modern

technology. It should be modernize and needs to develop efficient and effective information channel to provide up to date data.

7. Corporate organizations must publish the financial statements, value of assets and liabilities should not be manipulated. Each and every managerial decision of organization must be made to maximize shareholders wealth.

## BIBLIOGRAPHY

### **Books:**

- Bhalla, V.K. (2001). *Investment Management*. New Delhi: S.Chanda and Company Ltd.
- Cheney, John M. and Moses, Edward A. (1996). *Fundamental of Investment*. St. Paul: West Publishing Company.
- Francis, Jack Clark (1997). *Investment Analysis and Management*. New York: McGraw-Hill Publication.
- Hampton, John J. (1996). *Financial Decision Making*. New Delhi: Prentice Hall of India Pvt. Ltd.
- Pradhan, Surendra (1992). *Basic Management*. Kathmandu: Kathmandu Educational Enterprises Pvt. Ltd.
- Sharpe, William F., Alexander Gordon J and Bailey Geffery V. (1995). *Investment*. USA: Prentice Hall of India.
- Shrestha, Manohar Krishna (1993). *Securities Exchange Centre: Problem and Prospects*. Kathmandu: United Dynamic Research and Consultancy.
- Van Horne, James C. (1998). *Financial Management Policy*. New Delhi: Prentice Hall of India Pvt. Ltd.
- Van Horne, James C. and Wachowicz, Jr. John, M. (1995). *Fundamentals of Financial Management*. New Delhi: Prentice Hall of India Pvt. Ltd.
- Weston J.F. and Brigham F.F. (1982). *Managerial Finance*. London: Hold-Saunders International Edition.

### **Journals, Reports and Articles:**

- Elton, Edwin J. (1999). Expected Return, Realized Returns and Pricing tests. *The Journal of Finance*.
- Ghimire, Atma Ram (2001). *Nepal Share Market and Investors Prospect*. Kathmandu: Business Age.
- Pokharel, Nawaraj (1999). Stock Market Doing Pretty Well. Kathmandu: *Business Age*.

Poudel, Narayan Prasad (2002). *Investing in Shares of Return and Risk Elements With Special References to Eight Commercial Banks*. Development Finance Department. Kathmandu: Nepal Rastra Bank.

Rouwenhost, K. Great (1999). *Local Return Factors and The Turnover in Emerging Markets*.

**Dissertations:**

Mishra, Shankar Kumar(2002). *Risk and Return on Common Stock Investment of Commercial Banks in Nepal*. An Unpublished Master Degree Thesis T.U. Kathmandu.

Manandhar, Manilita (2003). *Analysis of Risk and Return on Common Stock Investment of Commercial Banks in Nepal With Special Reference to Five Listed Commercial Banks in Nepal*. An Unpublished Master Degree Thesis T.U. Kathmandu.

Khadka, Ramhari (2004). *Analysis of Risk and Return on Selected Nepalese Commercial Banks Listed in NEPSE*. An Unpublished Master of Business Administration Thesis T.U. Kathmandu.

Manadhar, Surendra (2005). *A Study of Risk and Return Analysis on Common Stock Investment With Special Reference to Six Listed Commercial Banks*. An Unpublished Master Degree Thesis T.U. Kathmandu.

Manandhar, Sarmila (2005). *Risk, Return and Investment of Commercial Banks in Nepal With References to four Commercial Banks in Nepal*. An Unpublished Master Degree Thesis T.U. Kathmandu.

Manandhar, Manilita (2009). *Analysis of Risk and Return on Common Stock Investment of Commercial Banks in Nepal With Special Reference to Five Listed Commercial Banks in Nepal*. An Unpublished Master Degree Thesis T.U. Kathmandu.

Khadka, Ramhari (2008). *Analysis of Risk and Return on Selected Nepalese Commercial Banks Listed in NEPSE*. An Unpublished Master of Business Administration Thesis T.U. Kathmandu.

Manadhar, Surendra (2010). *A Study of Risk and Return Analysis on Common Stock Investment With Special Reference to Six Listed Commercial Banks*. An Unpublished Master Degree Thesis T.U. Kathmandu.

**Websites:**

[www.nepalstock.com](http://www.nepalstock.com)

[www.nrb.org.np](http://www.nrb.org.np)

[www.sebonp.com](http://www.sebonp.com)

## Appendix-I

### Calculation of total dividend of common stock

Total dividend = Cash dividend + % of stock dividend x Next year's MPS

#### Total dividend of SCBNL

2006/07 – 10% of 5900 + 130 = 720

2007/08 – 50% of 6380 + 80 = 3495

2007/09 – 50% of 6010 + 80 = 3085

2009/10 – 50% of 5430 + 50 = 2795

2010/11 – 55% of 1800 + 55 = 325

Note: Expected closing price of 2011/12 is made up Rs. 1825 considering last volume taken from daily newspaper.

#### Total dividend of NABIL:

2007/08 – 40% of 5275 + 100 = 2210

2008/09 – 40% of 4899 + 60 = 2019.60

2009/10 – 50% of 2384 + 35 = 1227

2010/11 – 30% of 1252 + 30 = 405.6

Note: Expected closing price of 2011/12 is made up Rs. 1252 considering last volume taken from daily newspaper.

#### Total dividend of BOKL:

2006/07 – 30% of 1075 + 18 = 340.50

2007/09 – 40 % of 1750 + 2.1053 = 702.11

2009/10 – 40 % of 840 + 7.37 = 343.37

2010/11 – 15 % of 570 + 15 = 100.5

Note: Expected closing price of 2011/12 is made up Rs. 570 considering last volume taken from daily newspaper.

#### Total dividend of HBL:

2004/05 – 20% of 920 = 184

2005/06 – 20% of 1110 + 11.58 = 233.58

2006/07 – 5% of 1740 + 30 = 117

2007/08 – 25% of 1980 + 15 = 510

2008/09 – 20% of 1760 + 25 = 377

2009/10 – 31.56% + 816 + 12 = 269.53

Note: Expected closing rice of 2011/'12 is made up Rs. 575 considering last volume taken from daily newspaper.

**Total dividend of Nepal SBI Bank**

2006/07 – 5% of 1176 + 5 = 63.80

2007/08 – 47.59% of 1511 + 12.59 = 731.675

2009/10 – 42.11% of 741 + 2.11 = 314.1451

Note: Expected closing price of 2011/12 is made up Rs. 565 considering last volume taken from daily newspaper.

**Total dividend of NIBL**

2006/07 – 35.46% of 1729 + 20 = 633.103

2007/08 – 25% of 2450 + 5 = 617.50

2008/09 – 33.33% of 1388 + 7.5 = 470.12

## Appendix-II

### Statistical Analysis of Common Stock of SCBNL

| Fiscal Year | Year End Price | Dividend | $R = \frac{(p_t - p_{t-1}) + D_t}{P_{t-1}}$ | R-E(R <sub>j</sub> ) | [R-E(R <sub>j</sub> )] <sup>2</sup> |
|-------------|----------------|----------|---|----------------------|-------------------------------------|
| 2004/05     | 2345           | 120      | -   | -                    | -                                   |
| 2005/06     | 3775           | 720      | 0.91868                                     | 0.4710               | 0.2218                              |
| 2006/07     | 5900           | 3495     | 1.4887                                      | 1.0438               | 1.0895                              |
| 2007/08     | 6830           | 3085     | 0.6805                                      | 0.2356               | 0.0555                              |
| 2008/09     | 6010           | 2765     | 0.2848                                      | -0.1600              | 0.0256                              |
| 2009/10     | 5430           | 325      | -0.0424                                     | -0.4873              | 0.2374                              |
| 2010/11     | 1800           | 50       | -0.6593                                     | -1.1041              | 1.2191                              |
| Total       |                |          | $\Sigma R = 2.6691$                         |                      | $\Sigma [R-E(R_j)]^2 = 2.8233$      |

$$\text{Expected return, } E(R_j) = \frac{\Sigma R}{n} = \frac{2.6691}{6} = 0.4449 = 44.49\%$$

$$\text{Standard deviation } (\sigma) = \sqrt{\frac{\Sigma [R - E(R_j)]^2}{n-1}} = \sqrt{\frac{2.8233}{6-1}} = 0.7519 = 75.19\%$$

$$\text{Coefficient of variation (C.V.)} = \frac{\sigma}{E(R_j)} = \frac{0.7519}{0.4449} = 1.6890$$

### Statistical Analysis of Common Stock of NABIL

| Fiscal Year | Year End Price | Dividend | $R = \frac{(p_t - p_{t-1}) + D_t}{P_{t-1}}$ | R-E(R <sub>j</sub> ) | [R-E(R <sub>j</sub> )] <sup>2</sup>             |
|-------------|----------------|----------|---|----------------------|---|
| 2004/05     | 1000           | 65       | -   | -                    | -   |
| 2005/06     | 1505           | 70       | 0.5750                                      | -0.0144              | 0.000736  |
| 2006/07     | 2240           | 85       | 0.5449                                      | -0.0445              | 0.009803  |
| 2007/08     | 5050           | 2210     | 2.2411                                      | 1.6517               | 2.7281  |
| 2008/09     | 5275           | 2019.60  | 0.4445                                      | -0.1449              | 0.02099   |
| 2009/10     | 4899           | 1227     | 0.1613                                      | -0.4281              | 0.1833  |
| 2010/11     | 2384           | 405.6    | -0.4306                                     | -1.02                | 1.0404  |
| Total       |                |          | ΣR = 3.5862                                 |                      | Σ[R-E(R <sub>j</sub> )] <sup>2</sup><br>= 3.983 |

$$\text{Expected return, } E(R_j) = \frac{\sum R}{n} = \frac{3.5362}{6} = 0.5894 = 58.94\%$$

$$\text{Standard deviation } (\sigma) = \sqrt{\frac{\sum [R - E(R_j)]^2}{n-1}} = \sqrt{\frac{3.983}{6-1}} = 0.8925 = 89.25\%$$

$$\text{Coefficient of variation (C.V.)} = \frac{\sigma}{E(R_j)} = \frac{0.8925}{0.5894} = 1.514$$

### Statistical Analysis of common stock of BOKL

| Fiscal Year | Year End Price | Dividend | $R = \frac{(p_t - p_{t-1}) + D_t}{P_{t-1}}$ | R-E(R <sub>j</sub> ) | [R-E(R <sub>j</sub> )] <sup>2</sup>              |
|-------------|----------------|----------|---|----------------------|--|
| 2004/05     | 295            | 10       | -   | -                    | -  |
| 2005/06     | 430            | 15       | 0.5085                                      | -0.1302              | 0.01695  |
| 2006/07     | 850            | 340.50   | 1.7686                                      | 1.1299               | 1.2767   |
| 2007/08     | 1075           | 20       | 0.2882                                      | -0.3505              | 0.1229   |
| 2008/09     | 2350           | 702.11   | 1.8392                                      | 1.2005               | 1.4412   |
| 2009/10     | 1750           | 343.37   | -0.1032                                     | -0.7473              | 0.5594   |
| 2010/11     | 840            | 105.5    | -0.463                                      | -1.1017              | 1.214  |
| Total       |                |          | ΣR = 3.8323                                 |                      | Σ[R-E(R <sub>j</sub> )] <sup>2</sup><br>= 4.6312 |

$$\text{Expected return, } E(R_j) = \frac{\sum R}{n} = \frac{3.8323}{6} = 0.6387 = 63.87\%$$

$$\text{Standard deviation } (\sigma) = \sqrt{\frac{\sum [R - E(R_j)]^2}{n-1}} = \sqrt{\frac{4.6312}{6-1}} = 0.9624 = 96.24\%$$

$$\text{Coefficient of variation (C.V.)} = \frac{\sigma}{E(R_j)} = \frac{0.9624}{0.6387} = 1.5068$$

### Statistical analysis of common stock of HBL

| Fiscal Year | Year End Price | Dividend | $R = \frac{(p_t - p_{t-1}) + D_t}{P_{t-1}}$ | R-E(R <sub>j</sub> ) | [R-E(R <sub>j</sub> )] <sup>2</sup>              |
|-------------|----------------|----------|---|----------------------|--|
| 2004/05     | 840            | 184      | -   | -                    | -  |
| 2005/06     | 920            | 233.58   | 0.3733                                      | 0.0957               | 0.009506   |
| 2006/07     | 1110           | 117      | 0.3337                                      | 0.0561               | 0.00315  |
| 2007/08     | 1740           | 510      | 1.0270                                      | 0.7494               | 0.5616   |
| 2008/09     | 1980           | 377      | 0.35416                                     | 0.007                | 0.00049  |
| 2009/10     | 1760           | 269.53   | 0.0250                                      | -0.2526              | 0.0638   |
| 2010/11     | 816            | 155.6    | -0.4479                                     | -0.7255              | 0.5264   |
| Total       |                |          | ΣR = 1.6657                                 |                      | Σ[R-E(R <sub>j</sub> )] <sup>2</sup><br>= 1.1649 |

$$\text{Expected return, } E(R_j) = \frac{\sum R}{n} = \frac{1.6657}{6} = 0.2776 = 27.76\%$$

$$\text{Standard deviation } (\sigma) = \sqrt{\frac{\sum [R - E(R_j)]^2}{n-1}} = \sqrt{\frac{1.1649}{6-1}} = 0.4827 = 48.27\%$$

$$\text{Coefficient of variation (C.V.)} = \frac{\sigma}{E(R_j)} = \frac{0.4827}{0.2776} = 1.738$$

### Statistical analysis of common stock of Nepal SBI Bank

| Fiscal Year | Year End Price | Dividend | $R = \frac{(p_t - p_{t-1}) + D_t}{P_{t-1}}$ | R-E(R <sub>j</sub> ) | [R-E(R <sub>j</sub> )] <sup>2</sup>              |
|-------------|----------------|----------|---|----------------------|--|
| 2004/05     | 307            | -        | -   | -                    | -  |
| 2005/06     | 355            | -        | 0.1564                                      | -0.4056              | 0.1645   |
| 2006/07     | 612            | 63.80    | 0.9037                                      | 0.3417               | 0.1168   |
| 2007/08     | 1176           | 731.675  | 2.1171                                      | 1.555                | 2.418  |
| 2008/09     | 1511           | -        | 0.2849                                      | -0.2771              | 0.0768   |
| 2009/10     | 1900           | 314.15   | 0.4654                                      | -0.0966              | 0.00933  |
| 2010/11     | 741            | 103.88   | -0.5553                                     | -1.1173              | 1.2484   |
| Total       |                |          | ΣR = 3.3722                                 |                      | Σ[R-E(R <sub>j</sub> )] <sup>2</sup><br>= 4.0338 |

$$\text{Expected return, } E(R_j) = \frac{\sum R}{n} = \frac{3.3722}{6} = 0.5620 = 56.20\%$$

$$\text{Standard deviation } (\sigma) = \sqrt{\frac{\sum [R - E(R_j)]^2}{n-1}} = \sqrt{\frac{4.0338}{6-1}} = 0.8982 = 89.82\%$$

$$\text{Coefficient of variation (C.V.)} = \frac{\sigma}{E(R_j)} = \frac{0.8982}{0.5620} = 1.5982$$

### Statistical analysis of Common stock of NIBL

| Fiscal Year | Year End Price | Dividend | $R = \frac{(p_t - p_{t-1}) + D_t}{P_{t-1}}$ | R-E(R <sub>j</sub> ) | [R-E(R <sub>j</sub> )] <sup>2</sup>              |
|-------------|----------------|----------|---|----------------------|--|
| 2004/05     | 940            | 15.00    | -   | -                    | -  |
| 2005/06     | 800            | 12.50    | -0.1356                                     | -0.4494              | 0.2019   |
| 2006/07     | 1260           | 633.103  | 1.3664                                      | 1.0526               | 1.1079   |
| 2007/08     | 1729           | 617.50   | 0.8623                                      | 0.5485               | 0.30085  |
| 2008/09     | 2450           | 470.12   | 0.6889                                      | 0.3751               | 0.1407   |
| 2009/10     | 1388           | 20.00    | -0.4253                                     | -0.7391              | 0.5463   |
| 2010/11     | 705            | 25.00    | -0.4741                                     | -0.7879              | 0.6201   |
| Total       |                |          | ΣR = 1.8826                                 |                      | Σ[R-E(R <sub>j</sub> )] <sup>2</sup><br>= 2.9178 |

$$\text{Expected return, } E(R_j) = \frac{\sum R}{n} = \frac{1.8826}{6} = 0.3138 = 31.38\%$$

$$\text{Standard deviation } (\sigma) = \sqrt{\frac{\sum [R - E(R_j)]^2}{n-1}} = \sqrt{\frac{2.9178}{6-1}} = 0.7639 = 76.39\%$$

$$\text{Coefficient of variation (C.V.)} = \frac{\sigma}{E(R_j)} = \frac{0.7639}{0.3136} = 2.4359$$

**Realized return, expected return, standard deviation and coefficient of the variation of market index**

| Year    | Year-end index | Rm      | Rm-E(Rm) | [Rm-E(Rm)] <sup>2</sup> |
|---------|----------------|---------|----------|-------------------------|
| 2004/05 | 222.04         | -       | -        | -                       |
| 2005/06 | 286.67         | 0.2911  | 0.0957   | 0.009158                |
| 2006/07 | 386.83         | 0.3494  | 0.154    | 0.02372                 |
| 2007/08 | 683.95         | 0.7681  | 0.5727   | 0.3279                  |
| 2008/09 | 963.36         | 0.4085  | 0.2131   | 0.04541                 |
| 2009/10 | 749.10         | -0.2224 | -0.4178  | 0.1746                  |
| 2010/11 | 477.73         | -0.4223 | -0.6177  | 0.3816                  |
|         |                | 1.1724  |          | 0.9624                  |

$$\text{Expected return } E(R_m) = \frac{\sum(R_m)}{n} = \frac{1.1724}{6} = 0.1954 = 19.54\%$$

$$\text{Standard deviation } (\sigma_m) = \sqrt{\frac{\sum[R_m - E(R_m)]^2}{n-1}} = \sqrt{\frac{0.9624}{6-1}} = 0.4387 \text{ or } 43.87\%$$

$$\text{Coefficient of variation (C.V.)} = \frac{\sigma_m}{E(R_m)} = \frac{0.4387}{0.1954} = 2.2451$$

**Calculation of required rate of return (RRR), Expected Rate of Return (ERR) and Price Evaluation of Each stock by CAPM model**

| Banks          | Beta   | RRR = Rf +<br>[E(Rm) – Rf]β | E(Ri)  | Price situation |
|----------------|--------|-----------------------------|--------|-----------------|
| SCBNL          | 1.051  | 0.3639                      | 0.6435 | Under priced    |
| NABIL          | 1.783  | 0.5075                      | 0.5894 | Under priced    |
| BOKL           | 1.2567 | 0.2300                      | 0.6387 | Under priced    |
| HBL            | 1.0411 | 2.752                       | 0.2776 | Under priced    |
| Nepal SBI Bank | 1.6373 | 0.3618                      | 0.5620 | Under priced    |
| NIBL           | 1.3595 | 0.4321                      | 0.3188 | Under priced    |

Where,

$E(R_i)_-$  = Expected rate of return (from table 4.21)

$R_f$  = Risk free rate of return (0.0598)

$R_m$  = Market rate of return (0.1954)

$\beta$  = Beta of individual sample banks (from table 4.21)

### Statistical Analysis of Common Stock of Six Commercial Banks

| Fiscal year | Average return (R) | [R-E(R)] | [R-E(R)] <sup>2</sup> |
|-------------|--------------------|----------|-----------------------|
| 2005/06     | 0.3150             | -0.18925 | 0.0358                |
| 2006/07     | 0.9724             | 0.4682   | 0.2192                |
| 2007/08     | 1.3374             | 0.8332   | 0.6942                |
| 2008/09     | 0.7154             | 0.2112   | 0.04461               |
| 2009/10     | 0.067              | -0.4372  | 0.1911                |
| 2010/11     | -0.3823            | -0.8865  | 0.7859                |
| Total       | 2.0249             |          | 1.9708                |

$$\text{Expected return } E(R_m) = \frac{\sum(R_m)}{n} = \frac{3.0249}{6} = 0.5042$$

$$\text{Standard deviation } (\sigma_m) = \sqrt{\frac{\sum[R_m - E(R_m)]^2}{n-1}} = \sqrt{\frac{1.9708}{6-1}} = 0.6278 \text{ or } 43.87\%$$

$$\text{Coefficient of variation (C.V.)} = \frac{\sigma_m}{E(R_m)} = \frac{0.6278}{0.5042} = 1.2451$$

### Calculation of Covariance of Six Assets

| Assets                            | Covariance |
|-----------------------------------|------------|
| SCBNL and NABIL (A&B)             | 0.4226     |
| NABIL & BOKL (B&C)                | 0.1285     |
| BOKL & HBL (C&D)                  | 0.15698    |
| HBL and Nepal SBI Bank (D&E)      | 0.3965     |
| Nepal SBI Bank and NIBL (E and F) | 0.4485     |
| NIBL and SCBNL (F and A)          | 0.31602    |

As assuming before, proportion investment in each six assets is equal to 16.6667 of capital to minimize the risk.

Therefore,

$$W_A = W_B = W_C = W_D = W_E = W_F = 16.6667\% = 0.1667$$

And the portfolio return will be,

$$E(R_p) = W_A R(RA) + W_B E(RB) + W_C E(RC) + W_D E(RD) + W_E E(RE) + W_F E(RF)$$

$$= 0.1667 \times -0.6434 + 0.1667 \times 0.5894 + 0.1667 \times 0.6387 + 0.1667 \times 0.2776 + 0.1667 \times 0.5620 + 0.1667 \times 0.3188$$

$$= 0.5054 = 50.54\%$$

Where the portfolio risk is,

$$\sigma_p = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + \dots + W_F^2 \sigma_F^2 + 2W_A W_B \text{Cov}(RA, RB) + 2W_B W_C \text{Cov}(RB, RC) + 2W_C W_D \text{Cov}(RC, RD) + 2W_D W_E \text{Cov}(RD, RE) + 2W_E W_F \text{Cov}(RE, RF) + 2W_F W_A \text{Cov}(RF, RA)}$$

$$\sqrt{(0.1667)^2 (0.5547)^2 + (0.1667)^2 (0.8925)^2 + (0.1667)^2 (0.9624)^2 + (0.1667)^2 (0.4827)^2 + (0.1667)^2 (0.8982)^2 + (0.1667)^2 (0.7639)^2 + 2 \times 0.1667 \times 0.1667 \times 0.4226 + 2 \times 0.1667 \times 0.1667 \times 0.1285 + 2 \times 0.1667 \times 0.1667 \times 0.15698 + 2 \times 0.1667 \times 0.1667 \times 0.396 + 2 \times 0.1667 \times 0.1667 \times 0.4485 + 2 \times 0.1667 \times 0.1667 \times 0.31602}$$

$$= \sqrt{0.2054}$$

$$= 0.4532 \text{ i.e. } 45.32\%$$

### Appendix-III

#### Calculation of Beta Coefficient and other value of SCBNL

| Year    | R-E(Rj) | Rm-E(Rm) | [Rm-E(Rm)] [R-E(Rj)] |
|---------|---------|----------|----------------------|
| 2004/05 | -       | -        | -                    |
| 2005/06 | -0.2309 | 0.0957   | -0.02209             |
| 2006/07 | 0.2733  | 0.154    | 0.04209              |
| 2007/08 | 0.8452  | 0.5727   | 0.4840               |
| 2008/09 | 0.037   | 0.2131   | 0.0078               |
| 2009/10 | -0.3587 | -0.4178  | 0.1499               |
| 2010/11 | -0.5661 | -0.6177  | 0.3497               |
|         |         |          | 1.0114               |

Data Source: Table 4.2 and 4.14.

$$\text{Cov}(R_j, R_m) = \frac{\sum [R - E(R_j)][R_m - E(R_m)]}{n - 1} = \frac{1.0114}{6 - 1} = 0.2023$$

$$\text{Beta coefficient of SCBNL } (\beta) = \frac{\text{Cov.}(R_j, R_m)}{\sigma_m^2} = \frac{0.2023}{0.1925} = 1.051$$

Calculation of alpha ( $\alpha$ ) intercept

We have,

Expected return of SCBNL,  $E(R_j) = 0.4449$

Expected return of market,  $E(R_m) = 0.1954$

Now,

$$\alpha = E(R_j) - \beta E(R_m)$$

$$= 0.4449 - 1.051 \times 0.1954$$

$$= 0.2395$$

Calculation of systematic risk and unsystematic risk.

We have,

$$\text{Variance of total risk of SCBNL } (\sigma)^2 = 0.3077$$

$$\text{Variance of market } (\sigma_m)^2 = 0.1925$$

Total risk = Systematic risk + Unsystematic risk

$$\sigma^2 = \beta^2 \sigma_m^2 + e^2$$

$$\text{Systematic risk} = (1.051)^2 \times 0.1925$$

$$= 0.2126$$

Unsystematic risk ( $e^2$ ) = Total risk – Systematic risk

$$= 0.3077 - 0.2126$$

$$= 0.0951$$

Coefficient of determination or proportion of systematic risk ( $\rho^2$ ) and proportion of unsystematic risk ( $1-\rho^2$ )

We have,

$$\text{Proportion of systematic risk } (\rho^2) = \frac{\text{Systematic risk}}{\text{Total risk}}$$

$$= \frac{0.2126}{0.3077} = 0.6909 = 69.09\%$$

$$\text{Correlation with market } (\rho) = \sqrt{0.6910} = 0.8313$$

$$\text{Proportion of unsystematic risk } (1-\rho^2) = 1-0.6910 = 0.309 = 30.9\%$$

## Appendix-IV

### Calculation of Beta Coefficient ( $\beta$ ) and other value of NABIL

| Year    | R-E(R <sub>j</sub> ) | R <sub>m</sub> -E(R <sub>m</sub> ) | [R <sub>m</sub> -E(R <sub>m</sub> )] [R-E(R <sub>j</sub> )] |
|---------|----------------------|------------------------------------|---|
| 2004/05 | -                    | -                                  | -   |
| 2005/06 | -0.0144              | 0.0957                             | -0.00138  |
| 2006/07 | -0.0445              | 0.154                              | -0.00685  |
| 2007/08 | 1.6517               | 0.5727                             | 0.9459  |
| 2008/09 | -0.1449              | 0.2131                             | -0.03088  |
| 2009/10 | -0.4281              | -0.4178                            | 0.1789  |
| 2010/11 | -1.02                | -0.6177                            | 0.6301  |
|         |                      |                                    | 1.7158  |

Data source: Table 4.4 and 4.14.

$$\text{Cov}(R_j, R_m) = \frac{\sum [R - E(R_j)][R_m - E(R_m)]}{n - 1} = \frac{1.7158}{6.1} = 0.3432$$

$$\text{Beta coefficient of SCBNL } (\beta) = \frac{\text{Cov.}(R_j, R_m)}{\sigma_m^2} = \frac{0.3432}{0.1925} = 1.783$$

Calculation of alpha ( $\alpha$ ) intercept

We have,

Expected return of SCBNL,  $E(R_j) = 0.5894$

Expected return of market,  $E(R_m) = 0.1954$

Now,

$$\begin{aligned} \alpha &= E(R_j) - \beta E(R_m) \\ &= 0.5894 - 1.783 \times 0.1954 \\ &= 0.2410 \end{aligned}$$

Calculation of systematic risk and unsystematic risk.

We have,

Variance of total risk of SCBNL  $(\sigma)^2 = 0.7966$

Variance of market  $(\sigma_m)^2 = 0.1925$

Total risk = Systematic risk + Unsystematic risk

$$\sigma^2 = \beta^2 \sigma_m^2 + e^2$$

$$\text{Systematic risk} = (1.783)^2 \times 0.1925$$

$$= 0.61197$$

$$\text{Unsystematic risk (e}^2\text{)} = \text{Total risk} - \text{Systematic risk}$$

$$= 0.7966 - 0.61197$$

$$= 0.1846$$

Coefficient of determination or proportion of systematic risk ( $\rho^2$ ) and proportion of unsystematic risk ( $1-\rho^2$ )

We have,

$$\text{Proportion of systematic risk } (\rho^2) = \frac{\text{Systematic risk}}{\text{Total risk}}$$

$$= \frac{0.61197}{0.7966} = 0.7683 = 76.83\%$$

$$\text{Correlation with market } (\rho) = \sqrt{0.7683} = 0.8765$$

$$\text{Proportion of unsystematic risk } (1-\rho^2) = 1 - 0.7683 = 0.2317 = 23.17\%$$

## Appendix-V

### Calculation of Beta Coefficient ( $\beta$ ) and Other Value of BOKL

| Year    | R-E(R <sub>j</sub> ) | R <sub>m</sub> -E(R <sub>m</sub> ) | [R <sub>m</sub> -E(R <sub>m</sub> )] [R-E(R <sub>j</sub> )] |
|---------|----------------------|------------------------------------|---|
| 2004/05 | -                    | -                                  | -   |
| 2005/06 | -0.1302              | 0.0957                             | -0.0125   |
| 2006/07 | 1.1299               | 0.154                              | 0.174   |
| 2007/08 | -0.3505              | 0.5727                             | -0.20073  |
| 2008/09 | 1.2005               | 0.2131                             | 0.2558  |
| 2009/10 | -0.7479              | -0.4178                            | 0.3125  |
| 2010/11 | -1.1017              | -0.6177                            | 0.6805  |
|         |                      |                                    | 1.20957   |

Data source: Table 4.4 and 4.14.

$$\text{Cov}(R_j, R_m) = \frac{\sum [R - E(R_j)][R_m - E(R_m)]}{n - 1} = \frac{1.20957}{6.1} = 0.2419$$

$$\text{Beta coefficient of SCBNL } (\beta) = \frac{\text{Cov.}(R_j, R_m)}{\sigma_m^2} = \frac{0.2419}{0.1925} = 1.2567$$

Calculation of alpha ( $\alpha$ ) intercept

We have,

Expected return of SCBNL,  $E(R_j) = 0.6387$

Expected return of market,  $E(R_m) = 0.1954$

Now,

$$\begin{aligned} \alpha &= E(R_j) - \beta E(R_m) \\ &= 0.6387 - 1.2567 \times 0.1954 \\ &= 0.3931 \end{aligned}$$

Calculation of systematic risk and unsystematic risk.

We have,

Variance of total risk of SCBNL  $(\sigma)^2 = 0.92624$

Variance of market  $(\sigma_m)^2 = 0.1925$

Total risk = Systematic risk + Unsystematic risk

$$\sigma^2 = \beta^2 \sigma_m^2 + e^2$$

$$\text{Systematic risk} = (1.2567)^2 \times 0.1925$$

$$= 0.3040$$

$$\text{Unsystematic risk (e}^2\text{)} = \text{Total risk} - \text{Systematic risk}$$

$$= 0.92624 - 0.3040$$

$$= 0.62224$$

Coefficient of determination or proportion of systematic risk ( $\rho^2$ ) and proportion of unsystematic risk ( $1-\rho^2$ )

We have,

$$\text{Proportion of systematic risk } (\rho^2) = \frac{\text{Systematic risk}}{\text{Total risk}}$$

$$= \frac{0.3040}{0.92624} = 0.3283 = 32.83\%$$

$$\text{Correlation with market } (\rho) = \sqrt{0.3283} = 0.5729$$

$$\text{Proportion of unsystematic risk } (1-\rho^2) = 1 - 0.3283 = 0.6717 = 67.17\%$$

### 1.2.9 Calculation of Beta Coefficient( $\beta$ ) and other value of HBL

| Fiscal Year | R-E(R <sub>j</sub> ) | R <sub>M</sub> -E(R <sub>m</sub> ) | [R <sub>m</sub> -E(R <sub>m</sub> )] [R-E(R <sub>j</sub> )] |
|-------------|----------------------|------------------------------------|---|
| 2004/05     | -                    | -                                  | -   |
| 2005/06     | 0.0957               | 0.0957                             | 0.00913   |
| 2006/07     | 0.0561               | 0.154                              | 0.00864   |
| 2007/08     | 0.7494               | 0.5727                             | 0.4292  |
| 2008/09     | 0.007                | 0.2131                             | 0.001492  |
| 2009/10     | -0.2526              | -0.4178                            | 0.10554   |
| 2010/11     | -0.7255              | -0.6177                            | 0.4481  |
| Total       |                      |                                    | $\Sigma[R_m - E(R_m)][R - E(R_j)] = 1.0021$                 |

Data Source: Table 4.8 and 4.14

$$\text{Cov}(R_j, R_m) = \frac{\Sigma R - E(R_j)R_m - E(R_m)}{n-1}$$

$$= \frac{1.0021}{6-1}$$

$$= 0.20042$$

$$\text{Beta Coefficient of HBL}(\beta) = \frac{\text{Cov}(R_j, R_m)}{\sigma_m^2}$$

$$= \frac{0.20042}{0.1925}$$

$$= 1.0411$$

Calculation of alpha ( $\alpha$ ) intercept

We have,

Expected return of HBL,  $E(R_j) = 0.2776$

Expected return of market,  $E(R_m) = 0.1954$

Now,

$$\alpha = E(R_j) - \beta E(R_m)$$

$$= 0.2776 - 1.0411 \times 0.1954$$

$$= 0.07417$$

Calculation of systematic risk and unsystematic risk

We have,

Variance of Total risk of HBL ( $\sigma^2$ ) = 0.23298

Variance of market ( $\sigma_m^2$ ) = 0.1925

Total risk = Systematic risk + unsystematic risk

$$\sigma^2 = \beta^2 \sigma_m^2 + e^2$$

Systematic Risk =  $(1.0411)^2 \times 0.1925$

$$= 0.20865$$

Unsystematic Risk = Total Risk – Systematic Risk

$$= 0.23298 - 0.20865$$

$$= 0.02433$$

Coefficient of determination or proportion of systematic risk ( $\rho^2$ ) and

proportion of unsystematic risk ( $1 - \rho^2$ )

We have,

$$\text{Proportion of systematic risk } (\rho^2) = \frac{\text{Systematic Risk}}{\text{Total Risk}}$$

$$= \frac{0.20865}{0.23298}$$

$$= 0.8956$$

$$= 89.56\%$$

$$\text{Correlation with market } (\rho) = \sqrt{0.8956}$$

$$= 0.9465$$

$$= 0.1044$$

$$= 10.44\%$$

## Appendix VII

### Calculation of Beta Coefficient ( $\beta$ ) and other value of NEPAL SBI BANK LTD.

| Fiscal Year | R-E( $R_j$ ) | $R_M$ -E( $R_m$ ) | [ $R_m$ -E( $R_m$ )][R-E( $R_j$ )]    |
|-------------|--------------|-------------------|---------------------------------------|
| 2004/05     | -            | -                 | -                                     |
| 2005/06     | -0.4056      | 0.0957            | -0.03882                              |
| 2006/07     | 0.3417       | 0.154             | 0.05262                               |
| 2007/08     | 1.555        | 0.5727            | 0.8906                                |
| 2008/09     | -0.2771      | 0.2131            | -0.0591                               |
| 2009/10     | -0.0966      | -0.4178           | 0.04036                               |
| 2010/11     | -1.1173      | -0.6177           | 0.6902                                |
| Total       |              |                   | $\Sigma[R_m-E(R_m)][R-E(R_j)]=1.5759$ |

Data Source: Table 4.10 and 4.14

$$\text{Cov}(R_j, R_m) = \frac{\sum R - E(R_j)R_m - E(R_m)}{n-1}$$

$$= \frac{1.5759}{6-1}$$

$$= 0.3152$$

$$\text{Beta Coefficient of HBL}(\beta) = \frac{\text{Cov}(R_j, R_m)}{\sigma_m^2}$$

$$= \frac{0.3152}{0.1925}$$

$$= 1.6373$$

Calculation of alpha ( $\alpha$ ) intercept

We have,

Expected return of Nepal SBI Bank  $E(R_j)=0.5620$

Expected return of market,  $E(R_m)=0.1954$

Now,

$$\alpha = E(R_j) - \beta E(R_m)$$

$$= 0.5620 - 1.6373 \times 0.1954$$

$$= 0.2421$$

Calculation of systematic risk and unsystematic risk

We have,

Variance of Total risk of Nepal SBI Bank LTD ( $\sigma^2$ ) = 0.8068

Variance of market ( $\sigma_m^2$ ) = 0.1925

Total risk = Systematic risk + unsystematic risk

$$\sigma^2 = \beta^2 \sigma_m^2 + e^2$$

Systematic Risk =  $(1.6373)^2 \times 0.1925$

$$= 0.5160$$

Unsystematic Risk = Total Risk – Systematic Risk

$$= 0.8068 - 0.5160$$

$$= 0.2908$$

Coefficient of determination or proportion of systematic risk ( $\rho^2$ ) and proportion of unsystematic risk ( $1 - \rho^2$ )

We have,

$$\text{Proportion of systematic risk } (\rho^2) = \frac{\text{Systematic Risk}}{\text{Total Risk}}$$

$$= \frac{0.5160}{0.8068}$$

$$= 0.6396$$

$$= 63.96\%$$

Correlation with market ( $\rho$ ) =  $\sqrt{0.6396}$

$$= 0.7997$$

$$=1-0.6396$$

$$=36.04\%$$

### Appendix VIII

#### Calculation of Beta Coefficient ( $\beta$ ) and other value of NIBL

| Fiscal Year | R-E(R <sub>j</sub> ) | R <sub>M</sub> -E(R <sub>m</sub> ) | [R <sub>m</sub> -E(R <sub>m</sub> )] [R-E(R <sub>j</sub> )] |
|-------------|----------------------|------------------------------------|---|
| 2004/05     | -                    | -                                  | -   |
| 2005/06     | -0.4494              | 0.0957                             | -0.04301  |
| 2006/07     | 1.0526               | 0.154                              | 0.1621  |
| 2007/08     | 0.5485               | 0.52727                            | 0.3141  |
| 2008/09     | 0.3751               | 0.2131                             | 0.0799  |
| 2009/10     | -0.7391              | -0.4178                            | 0.3088  |
| 2010/11     | -0.7879              | -0.6177                            | 0.4867  |
| Total       |                      |                                    | $\Sigma[R_m-E(R_m)][R-E(R_j)]=1.3086$                       |

Data Source: Table 4.12 and 4.14

$$\text{Cov}(R_j, R_m) = \frac{\sum R - E(R_j)R_m - E(R_m)}{n-1}$$

$$= \frac{1.3086}{6-1}$$

$$= 0.2617$$

$$\text{Beta Coefficient of NIBL } (\beta) = \frac{\text{Cov}(R_j, R_m)}{\sigma_m^2}$$

$$= \frac{0.2617}{0.1925}$$

$$= 1.3595$$

Calculation of alpha ( $\alpha$ ) intercept

We have,

Expected return of NIBL  $E(R_j)=0.3138$

Expected return of market,  $E(R_m)=0.1954$

Now,

$$\alpha = E(R_j) - \beta E(R_m)$$

$$=0.3138-1.3595 \times 0.1954$$

$$=0.0482$$

Calculation of systematic risk and unsystematic risk

We have,

$$\text{Variance of Total risk of NIBL } (\sigma^2)=0.5836$$

$$\text{Variance of market } (\sigma_m^2)=0.1925$$

Total risk = Systematic risk + unsystematic risk

$$\sigma^2=\beta^2\sigma_m^2+e^2$$

$$\text{Systematic Risk}=(1.3595)^2 \times 0.1925$$

$$=0.3558$$

Unsystematic Risk=Total Risk – Systematic Risk

$$=0.5836-0.3558$$

$$=0.2278$$

Coefficient of determination or proportion of systematic risk ( $\rho^2$ ) and proportion of unsystematic risk ( $1-\rho^2$ )

We have,

$$\text{Proportion of systematic risk } (\rho^2)=\frac{\text{Systematic Risk}}{\text{Total Risk}}$$

$$=\frac{0.3558}{0.58236}$$

$$=0.6097$$

$$=60.97\%$$

$$\text{Correlation with market } (\rho)=\sqrt{0.6097}$$

$$=0.7808$$

$$=1-0.6097$$

$$=0.3903$$

$$=39.03\%$$

### **1.2.10 Appendix IX**

#### **Calculation of Required Rate of Return**

$$\text{Required Rate of Return (RRR)}=R_f+[E(R_m)-R_f]\beta$$

$$\text{RRR of SCBNL}=0.0598+(0.1954-0.0598) \times 1.059$$

$$=0.2023$$

$$\text{RRR of NABIL} = 0.0598 + (0.1954 - 0.0598) \times 1.2567$$

$$=0.2302$$

$$\text{RRR of BOKL} = 0.0598 + (0.1954 - 0.0598) \times 1.1.2567$$

$$=0.2302$$

$$\text{RRR of HBL} = 0.598 + (0.2302 - 0.0598) \times 1.0411$$

$$=0.20097$$

$$\text{RRR of Nepal SBI Bank Ltd.} = 0.0598 + (0.1954 - 0.0598) \times 1.6373$$

$$=0.2818$$

$$\text{RRR of NIBL} = 0.0598 + (0.1954 - 0.0598) \times 1.3595$$

$$=0.2447$$

### 1.2.11 Appendix X

#### a. Calculation of Covariance of Asset of SCBNL (A) and NABIL (B)

| Fiscal Year | $R_A - E(R_A)$ | $R_B - E(R_B)$ | $R_A - E(R_A) R_B - E(R_B)$                 |
|-------------|----------------|----------------|---|
| 2005/06     | -0.2309        | -0.0144        | 0.003325                                    |
| 2006/07     | 0.2733         | -0.0445        | -0.01216                                    |
| 2007/08     | 0.8452         | 1.6317         | 1.3960                                      |
| 2008/09     | 0.037          | -0.1449        | -0.005361                                   |
| 2009/10     | -0.3587        | -0.4281        | 0.1536                                      |
| 2010/11     | -0.5661        | -1.02          | 0.5774                                      |
| Total       |                |                | $\Sigma R_A - E(R_A) R_B - E(R_B) = 2.1128$ |

Now,

$$\text{Cov}(R_A, R_B) = \frac{\sum R_A - E(R_A) R_B - E(R_B)}{n-1}$$

$$= \frac{2.1128}{6-1}$$

$$=0.4226$$

#### b. Calculation of Covariance of Asset of NABIL (B) and BOKL (C)

| Fiscal Year | $R_A - E(R_A)$ | $R_C - E(R_C)$ | $R_B - E(R_B) R_C - E(R_C)$ |
|-------------|----------------|----------------|-----------------------------|
| 2005/06     | -0.01144       | -0.13020       | 0.001875                    |
| 2006/07     | -0.0445        | 1.1299         | -0.05028                    |

|         |   |         |         |
|---------|---|---------|---------|
| 2007/08 | 1.6517                                      | -0.3505 | -0.5789 |
| 2008/09 | -0.1449                                     | 1.2005  | -0.1739 |
| 2009/10 | -0.4281                                     | -0.7473 | 0.3202  |
| 2010/11 | -1.02                                       | -1.1017 | 1.1237  |
| Total   | $\Sigma R_A - E(R_A) R_B - E(R_B) = 0.6427$ |         |         |

Now,

$$\begin{aligned} \text{Cov}(R_B, R_C) &= \frac{\sum R_B - E(R_B) R_C - E(R_C)}{n-1} \\ &= \frac{0.6427}{6-1} \\ &= 0.1285 \end{aligned}$$

**c. Calculation of Covariance of Asset of BOKL (C) and HBL (D)**

| Fiscal Year | $R_B - E(R_B)$                       | $R_D - E(R_D)$ | $R_C - E(R_C) R_D - E(R_D)$ |
|-------------|--------------------------------------|----------------|-----------------------------|
| 2005/06     | -0.1302                              | 0.0957         | -0.01246                    |
| 2006/07     | 1.1299                               | 0.0561         | 0.06339                     |
| 2007/08     | -0.3505                              | 0.7494         | -0.2627                     |
| 2008/09     | 1.2005                               | 0.007          | 0.008404                    |
| 2009/10     | -0.7479                              | -0.2526        | 0.18892                     |
| 2010/11     | -1.1017                              | -0.7255        | 0.7993                      |
| Total       | $\Sigma R_C - E(R_C) R_D - E(R_D) =$ |                |                             |

Now,

$$\begin{aligned} \text{Cov}(R_B, R_C) &= \frac{\sum R_C - E(R_C) R_D - E(R_D)}{n-1} \\ &= \frac{0.7849}{6-1} \\ &= 0.15698 \end{aligned}$$

**d. Calculation of Covariance of Asset of HBL (D) and Nepal SBI Bank (E)**

| Fiscal Year | $R_D - E(R_D)$ | $R_E - E(R_E)$ | $R_D - E(R_D) R_E - E(R_E)$ |
|-------------|----------------|----------------|-----------------------------|
| 2005/06     | 0.0957         | -0.4056        | -0.03882                    |
| 2006/07     | 0.0561         | 0.3417         | 0.01917                     |
| 2007/08     | 0.7494         | 1.555          | 1.1653                      |

|         |         |         |   |
|---------|---------|---------|---|
| 2008/09 | 0.007   | -0.2771 | 0.001939                                    |
| 2009/10 | -0.2526 | -0.0966 | 0.0244                                      |
| 2010/11 | -0.7255 | -1.1173 | 0.8106                                      |
| Total   |         |         | $\Sigma R_D - E(R_D) R_E - E(R_E) = 1.9826$ |

Now,

$$\begin{aligned} \text{Cov}(R_D, R_E) &= \frac{\Sigma R_D - E(R_D) R_E - E(R_E)}{n-1} \\ &= \frac{1.9826}{6-1} \\ &= 0.3965 \end{aligned}$$

**e. Calculation of Covariance of Asset of Nepal SBI bank (E) NIBL (F)**

| Fiscal Year | $R_E - E(R_E)$ | $R_F - E(R_F)$ | $R_E - E(R_E) R_F - E(R_F)$                 |
|-------------|----------------|----------------|---|
| 2005/06     | -0.4056        | -0.4494        | 0.1823                                      |
| 2006/07     | 0.3417         | 1.0526         | 0.3597                                      |
| 2007/08     | 1.555          | 0.5485         | 0.8529                                      |
| 2008/09     | -0.2771        | 0.3751         | -0.1039                                     |
| 2009/10     | -0.0966        | -0.7391        | -0.07139                                    |
| 2010/11     | -1.1173        | -0.7879        | 0.8803                                      |
| Total       |                |                | $\Sigma R_E - E(R_E) R_F - E(R_F) = 2.2427$ |

Now,

$$\begin{aligned} \text{Cov}(R_E, R_F) &= \frac{\Sigma R_E - E(R_E) R_F - E(R_F)}{n-1} \\ &= \frac{2.2427}{6-1} \\ &= 0.4485 \end{aligned}$$

**f. Calculation of Covariance of Asset of NIBL (F) and SCBNL (A)**

| Fiscal Year | $R_F - E(R_F)$ | $R_A - E(R_A)$ | $R_F - E(R_F) R_A - E(R_A)$ |
|-------------|----------------|----------------|-----------------------------|
| 2005/06     | -0.4494        | -0.2309        | 0.1039                      |
| 2006/07     | 1.0526         | 0.2733         | 0.2877                      |
| 2007/08     | 0.5485         | 0.8452         | 0.4636                      |
| 2008/09     | 0.3751         | 0.037          | 0.0139                      |

|         |         |         |   |
|---------|---------|---------|---|
| 2009/10 | -0.7391 | -0.3587 | 0.2651                                      |
| 2010/11 | -0.7879 | -0.5661 | 0.4460                                      |
| Total   |         |         | $\Sigma R_F - E(R_F) R_A - E(R_A) = 1.5801$ |

Now,

$$\text{Cov}(R_F, R_A) = \frac{\sum R_F - E(R_F) R_A - E(R_A)}{n-1}$$

$$= \frac{1.5801}{6-1}$$

$$= 0.31602$$

**g. Calculation of Covariance of Asset of SCBNL (A) and BOKL (C)**

| Fiscal Year | $R_A - E(R_A)$ | $R_C - E(R_C)$ | $(R_A - E(R_A)) (R_C - E(R_C))$                 |
|-------------|----------------|----------------|---|
| 2005/06     | -0.2309        | -0.1302        | 0.03006   |
| 2006/07     | 0.2733         | 1.1299         | 0.3088  |
| 2007/08     | 0.8452         | -0.3505        | -0.2962   |
| 2008/09     | 0.037          | 1.2005         | 0.0444  |
| 2009/10     | -0.3587        | -0.7479        | 0.2683  |
| 2010/11     | -0.5661        | -1.1017        | 0.6237  |
| Total       |                |                | $\Sigma (R_A - E(R_A)) (R_C - E(R_C)) = 0.9791$ |

Now,

$$\text{Cov}(R_A, R_C) = \frac{\sum (R_A - E(R_A)) (R_C - E(R_C))}{n-1}$$

$$= \frac{0.9791}{6-1}$$

$$= 0.1958$$

**h. Calculation of covariance of Asset of SCBNL (A) and HBL (D)**

| Fiscal Year | $R_A - E(R_A)$ | $R_D - E(R_D)$ | $(R_A - E(R_A)) (R_D - E(R_D))$ |
|-------------|----------------|----------------|---------------------------------|
| 2005/06     | -0.2309        | 0.0957         | -0.002209                       |
| 2006/07     | 0.2733         | 0.0561         | 0.01533                         |
| 2007/08     | 0.8452         | 0.7494         | 0.6334                          |
| 2008/09     | 0.037          | 0.007          | 0.000259                        |
| 2009/10     | -0.3587        | -0.2526        | 0.09061                         |

|         |         |         |   |
|---------|---------|---------|---|
| 2010/11 | -0.5661 | -0.7255 | 0.4107                                      |
| Total   |         |         | $\Sigma R_A - E(R_A) R_D - E(R_D) = 1.1282$ |

Now,

$$\text{Cov}(R_A, R_D) = \frac{\sum R_A - E(R_A) R_D - E(R_D)}{n-1}$$

$$= \frac{1.1282}{6-1}$$

$$= 0.2256$$

**i. Calculation of Covariance of Asset of SCBNL (A) and Nepal SBI Bank (E)**

| Fiscal Year | $R_A - E(R_A)$ | $R_E - E(R_E)$ | $R_A - E(R_A) R_E - E(R_E)$                 |
|-------------|----------------|----------------|---|
| 2005/06     | -0.2309        | -0.4056        | 0.09365                                     |
| 2006/07     | 0.2733         | 0.3417         | 0.09339                                     |
| 2007/08     | .8452          | 1.555          | 1.3143                                      |
| 2008/09     | 0.037          | -0.2771        | -0.01025                                    |
| 2009/10     | -0.3587        | -0.0966        | 0.03465                                     |
| 2010/11     | -0.05661       | -1.1173        | 0.6325                                      |
| Total       |                |                | $\Sigma R_A - E(R_A) R_E - E(R_E) = 2.1582$ |

Now,

$$\text{Cov}(R_A, R_E) = \frac{\sum R_A - E(R_A) R_E - E(R_E)}{n-1}$$

$$= \frac{2.1582}{6-1}$$

$$= 0.4316$$

**j. Calculation of Covariance of Asset of NABIL (B) and HBL (D)**

| Fiscal Year | $R_B - E(R_B)$ | $R_D - E(R_D)$ | $R_B - E(R_B) R_D - E(R_D)$ |
|-------------|----------------|----------------|-----------------------------|
| 2005/06     | -0.0144        | .0957          | -0.001404                   |
| 2006/07     | -0.0445        | 0.0561         | -0.002496                   |
| 2007/08     | 1.6517         | 0.7494         | 1.2378                      |
| 2008/09     | -0.1449        | 0.007          | -0.001014                   |
| 2009/10     | -0.4281        | -0.2526        | 0.1081                      |

|         |       |         |   |
|---------|-------|---------|---|
| 2010/11 | -1.02 | -0.7255 | 0.74001                                     |
| Total   |       |         | $\Sigma R_B - E(R_B) R_D - E(R_D) = 2.0809$ |

Now,

$$\begin{aligned} \text{Cov}(R_B, R_D) &= \frac{\sum R_B - E(R_B) R_D - E(R_D)}{n-1} \\ &= \frac{2.0809}{6-1} \\ &= 0.4162 \end{aligned}$$

**k. Calculation of Covariance of Asset of NABIL (B) and Nepal SBI bank (E)**

| Fiscal Year | $R_B - E(R_B)$ | $R_E - E(R_E)$ | $(R_B - E(R_B)) (R_E - E(R_E))$                 |
|-------------|----------------|----------------|---|
| 2005/06     | -0.0144        | -0.4056        | 0.005841  |
| 2006/07     | -0.0445        | 0.3417         | -0.01521  |
| 2007/08     | 1.6517         | 1.555          | 2.5684  |
| 2008/09     | -0.1449        | -0.2771        | 0.04136   |
| 2009/10     | -0.4281        | -0.0966        | 0.0135  |
| 2010/11     | -1.02          | -1.1173        | 1.1396  |
| Total       |                |                | $\Sigma (R_B - E(R_B)) (R_E - E(R_E)) = 3.7801$ |

Now,

$$\begin{aligned} \text{Cov}(R_B, R_E) &= \frac{\sum R_B - E(R_B) R_E - E(R_E)}{n-1} \\ &= \frac{3.7801}{6-1} \\ &= 0.7560 \end{aligned}$$

**l. Calculation of covariance of Asset of NABIL (B) and NIBL (F)**

| Fiscal Year | $R_B - E(R_B)$ | $R_F - E(R_F)$ | $(R_B - E(R_B)) (R_F - E(R_F))$ |
|-------------|----------------|----------------|---------------------------------|
| 2005/06     | -0.0144        | -0.4494        | 0.006471                        |
| 2006/07     | -0.0445        | 1.0526         | -0.04684                        |
| 2007/08     | 1.6517         | 0.5485         | 0.90596                         |
| 2008/09     | -0.1449        | 0.3751         | -0.05435                        |
| 2009/10     | -0.4281        | -0.7391        | 0.3164                          |

|         |       |         |   |
|---------|-------|---------|---|
| 2010/11 | -1.02 | -0.7879 | 0.8037                                      |
| Total   |       |         | $\Sigma R_B - E(R_B) R_F - E(R_F) = 1.9313$ |

Now,

$$\text{Cov}(R_B, R_F) = \frac{\Sigma R_B - E(R_B) R_F - E(R_F)}{n-1}$$

$$= \frac{1.9313}{6-1}$$

$$= 0.3863$$

**m. Calculation of Covariance of Asset of BOKL (C) and Nepal SBI bank (E)**

| Fiscal Year | $R_C - E(R_C)$ | $R_E - E(R_E)$ | $(R_C - E(R_C)) (R_E - E(R_E))$             |
|-------------|----------------|----------------|---|
| 2005/06     | -0.1302        | -0.4056        | 0.05281                                     |
| 2006/07     | 1.1299         | 0.3417         | 0.3861                                      |
| 2007/08     | -0.3505        | 1.555          | -0.5450                                     |
| 2008/09     | 1.2005         | -0.2771        | 0.3327                                      |
| 2009/10     | -0.7479        | -0.0966        | 0.07224                                     |
| 2010/11     | -1.1017        | -1.1173        | 1.2309                                      |
| Total       |                |                | $\Sigma R_C - E(R_C) R_E - E(R_E) = 1.5298$ |

Now,

$$\text{Cov}(R_C, R_E) = \frac{\Sigma R_C - E(R_C) R_E - E(R_E)}{n-1}$$

$$= \frac{1.5298}{6-1}$$

$$= 0.3059$$

**n. Calculation of Covariance of Asset of BOKL (C) and NIBL (F)**

| Fiscal Year | $R_C - E(R_C)$ | $R_F - E(R_F)$ | $(R_C - E(R_C)) (R_F - E(R_F))$ |
|-------------|----------------|----------------|---------------------------------|
| 2005/06     | -0.1302        | -0.4494        | 0.05851                         |
| 2006/07     | 1.1299         | 1.0526         | 1.1893                          |
| 2007/08     | -0.3505        | 0.5485         | -0.1922                         |
| 2008/09     | 1.2005         | 0.3751         | 0.4503                          |
| 2009/10     | -0.7479        | -0.7391        | 0.5528                          |

|         |         |         |   |
|---------|---------|---------|---|
| 2010/11 | -1.1017 | -0.7879 | 0.8680                                      |
| Total   |         |         | $\Sigma R_C - E(R_C) R_F - E(R_F) = 2.9267$ |

Now,

$$\begin{aligned} \text{Cov}(R_C, R_F) &= \frac{\sum R_C - E(R_C) R_F - E(R_F)}{n-1} \\ &= \frac{2.9267}{6-1} \\ &= 0.5853 \end{aligned}$$

#### **o. Calculation of Covariance of Asset of HBL (D) and NIBL (F)**

| Fiscal Year | $R_D - E(R_D)$ | $R_F - E(R_F)$ | $R_C - E(R_C) R_F - E(R_F)$                 |
|-------------|----------------|----------------|---|
| 2005/06     | 0.0957         | -0.4494        | -0.04301                                    |
| 2006/07     | 0.0561         | 1.0526         | 0.05905                                     |
| 2007/08     | 0.7494         | 0.5485         | 0.41104                                     |
| 2008/09     | 0.007          | 0.3751         | 0.002626                                    |
| 2009/10     | -0.2526        | -0.7391        | 0.18669                                     |
| 2010/11     | -0.7255        | -0.7879        | 0.5716                                      |
| Total       |                |                | $\Sigma R_C - E(R_C) R_F - E(R_F) = 1.1879$ |

Now,

$$\begin{aligned} \text{Cov}(R_D, R_F) &= \frac{\sum R_D - E(R_D) R_F - E(R_F)}{n-1} \\ &= \frac{1.1879}{6-1} \\ &= 0.2376 \end{aligned}$$

### **1.2.12 Appendix XI**

#### **Calculation of Portfolio Analysis in Each Two Assets among the Selected Assets**

##### **a. Assets A and B i.e. SCBNL and NABIL**

$$W_A = W_B = 50\%$$

And the portfolio return will be,

$$\begin{aligned} E(R_P) &= W_A E(R_A) + W_B E(R_B) \\ &= 0.50 \times 0.6435 + 0.50 \times 0.5894 \\ &= 0.6165 \end{aligned}$$

Portfolio Risk is,

$$\begin{aligned}\sigma_P &= \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2W_A W_B \text{cov}(R_A, R_B)} \\ &= \sqrt{(0.50)^2 \times (0.5547)^2 + (0.50)^2 \times (0.8925)^2 + 2 \times 0.50 \times 0.50 \times 0.5226} \\ &= \sqrt{0.4874} \\ &= 0.6981 \\ &= 69.81\%\end{aligned}$$

**b. Assets B and C i.e. NABIL and BOKL**

$$W_B = W_C = 50\%$$

And the portfolio return will be,

$$\begin{aligned}E(R_P) &= W_B E(R_B) + W_C E(R_C) \\ &= 0.50 \times 0.5894 + 0.50 \times 0.6387 \\ &= 0.6141\end{aligned}$$

Portfolio Risk is,

$$\begin{aligned}\sigma_P &= \sqrt{W_B^2 \sigma_B^2 + W_C^2 \sigma_C^2 + 2W_B W_C \text{cov}(R_B, R_C)} \\ &= \sqrt{(0.50)^2 \times (0.8925)^2 + (0.50)^2 \times (0.9624)^2 + 2 \times 0.50 \times 0.50 \times 0.1285} \\ &= \sqrt{0.4949} \\ &= 0.7035 \\ &= 70.35\%\end{aligned}$$

**c. Assets C and D i.e. BOKL and HBL**

$$W_C = W_D = 50\%$$

And the portfolio return will be,

$$\begin{aligned}E(R_P) &= W_C E(R_C) + W_D E(R_D) \\ &= 0.50 \times 0.6387 + 0.50 \times 0.2776\end{aligned}$$

Portfolio Risk is,

$$\begin{aligned}\sigma_P &= \sqrt{W_C^2 \sigma_C^2 + W_D^2 \sigma_D^2 + 2W_C W_D \text{cov}(R_C, R_D)} \\ &= \sqrt{(0.50)^2 \times (0.9624)^2 + (0.50)^2 \times (0.4827)^2 + 2 \times 0.50 \times 0.50 \times 0.15698} \\ &= \sqrt{0.3683} \\ &= 0.6069\end{aligned}$$

$$=60.69\%$$

**d. Assets D and E i.e. HBL and Nepal SBI Bank**

$$W_D=W_E=50\%$$

And the portfolio return will be,

$$E(R_P)=W_DE(R_D)+W_EE(R_E)$$

$$=0.50 \times 0.2776 + 0.50 \times 0.5620$$

Portfolio Risk is,

$$\sigma_P = \sqrt{W_D^2 \sigma_D^2 + W_E^2 \sigma_E^2 + 2W_D W_E \text{cov}(R_D, R_E)}$$

$$= \sqrt{(0.50)^2 \times (0.4827)^2 + (0.50)^2 \times (0.8982)^2 + 2 \times 0.50 \times 0.50 \times 0.3965}$$

$$= \sqrt{0.4582}$$

$$=0.6769$$

$$=67.69\%$$

**e. Assets E and F i.e. Nepal SBI Bank and NIBL**

$$W_E=W_F=50\%$$

And the portfolio return will be,

$$E(R_P)=W_EE(R_E)+W_FE(R_F)$$

$$=0.50 \times 0.5620 + 0.50 \times 0.3138$$

$$=0.4379$$

Portfolio Risk is,

$$\sigma_P = \sqrt{W_E^2 \sigma_E^2 + W_F^2 \sigma_F^2 + 2W_E W_F \text{cov}(R_E, R_F)}$$

$$= \sqrt{(0.50)^2 \times (0.8982)^2 + (0.50)^2 \times (0.7639)^2 + 2 \times 0.50 \times 0.50 \times 0.4485}$$

$$= \sqrt{0.5718}$$

$$=0.7562$$

$$=75.62\%$$

**f. Assets F and A i.e. NIBL and SCBNL**

$$W_F=W_A=50\%$$

And the portfolio return will be,

$$E(R_P)=W_FE(R_F)+W_AE(R_A)$$

$$=0.50 \times 0.3138 + 0.50 \times 0.6435$$

$$=0.4787$$

Portfolio Risk is,

$$\begin{aligned}\sigma_P &= \sqrt{W_F^2 \sigma_F^2 + W_A^2 \sigma_A^2 + 2W_F W_A \text{cov}(R_F, R_A)} \\ &= \sqrt{(0.50)^2 x (0.7639)^2 + (0.50)^2 x (0.5547)^2 + 2x0.50x0.50x0.31602} \\ &= \sqrt{0.3808} \\ &= 0.6171 \\ &= 61.71\%\end{aligned}$$

**g. Assets A and C i.e. SCBNL and BOKL**

$$W_A = W_C = 50\%$$

And the portfolio return will be,

$$\begin{aligned}E(R_P) &= W_A E(R_A) + W_C E(R_C) \\ &= 0.50x0.6435 + 0.50x0.5620 \\ &= 0.6028\end{aligned}$$

Portfolio Risk is,

$$\begin{aligned}\sigma_P &= \sqrt{W_A^2 \sigma_A^2 + W_C^2 \sigma_C^2 + 2W_A W_C \text{cov}(R_A, R_C)} \\ &= \sqrt{(0.50)^2 x (0.5547)^2 + (0.50)^2 x (0.8982)^2 + 2x0.50x0.50x0.4316} \\ &= \sqrt{0.4944} \\ &= 0.7031 \\ &= 70.31\%\end{aligned}$$

**j. Assets B and D i.e. NABIL and HBL**

$$W_B = W_D = 50\%$$

And the portfolio return will be,

$$\begin{aligned}E(R_P) &= W_B E(R_B) + W_D E(R_D) \\ &= 0.50x0.5894 + 0.50x0.2776 \\ &= 0.4335\end{aligned}$$

Portfolio Risk is,

$$\begin{aligned}\sigma_P &= \sqrt{W_B^2 \sigma_B^2 + W_D^2 \sigma_D^2 + 2W_B W_D \text{cov}(R_B, R_D)} \\ &= \sqrt{(0.50)^2 x (0.8925)^2 + (0.50)^2 x (0.4827)^2 + 2x0.50x0.50x0.4162}\end{aligned}$$

$$= \sqrt{0.4655}$$

$$= 0.6823$$

$$= 68.23\%$$

### **k. Assets B and E i.e. NABIL and Nepal SBI Bank**

$$W_B = W_E = 50\%$$

And the portfolio return will be,

$$E(R_P) = W_B E(R_B) + W_E E(R_E)$$

$$= 0.50 \times 0.5894 + 0.50 \times 0.5620$$

$$= 0.5757$$

Portfolio Risk is,

$$\sigma_P = \sqrt{W_B^2 \sigma_B^2 + W_E^2 \sigma_E^2 + 2W_B W_E \text{cov}(R_B, R_E)}$$

$$= \sqrt{(0.50)^2 \times (0.8925)^2 + (0.50)^2 \times (0.8982)^2 + 2 \times 0.50 \times 0.50 \times 0.7560}$$

$$= \sqrt{0.7788}$$

$$= 0.8825$$

$$= 88.25\%$$

### **l. Assets B and F i.e. NABIL and NIBL**

$$W_B = W_F = 50\%$$

And the portfolio return will be,

$$E(R_P) = W_B E(R_B) + W_F E(R_F)$$

$$= 0.50 \times 0.5894 + 0.50 \times 0.3138$$

$$= 0.4516$$

Portfolio Risk is,

$$\sigma_P = \sqrt{W_B^2 \sigma_B^2 + W_F^2 \sigma_F^2 + 2W_B W_F \text{cov}(R_B, R_F)}$$

$$= \sqrt{(0.50)^2 \times (0.8925)^2 + (0.50)^2 \times (0.7639)^2 + 2 \times 0.50 \times 0.50 \times 0.3863}$$

$$= \sqrt{0.5382}$$

$$= 0.7336$$

$$= 73.36\%$$

**m. Assets C and E i.e. BOKL and Nepal SBI Bank**

$$W_C=W_E=50\%$$

And the portfolio return will be,

$$\begin{aligned} E(R_P) &= W_C E(R_C) + W_E E(R_E) \\ &= 0.50 \times 0.6387 + 0.50 \times 0.5620 \\ &= 0.60035 \end{aligned}$$

Portfolio Risk is,

$$\begin{aligned} \sigma_P &= \sqrt{W_C^2 \sigma_C^2 + W_E^2 \sigma_E^2 + 2W_C W_E \text{cov}(R_C, R_E)} \\ &= \sqrt{(0.50)^2 \times (0.9624)^2 + (0.50)^2 \times (0.8982)^2 + 2 \times 0.50 \times 0.50 \times 0.3059} \\ &= \sqrt{0.5862} \\ &= 0.7139 \\ &= 71.39\% \end{aligned}$$

**n. Assets C and F i.e. BOKL and NIBL**

$$W_C=W_F=50\%$$

And the portfolio return will be,

$$\begin{aligned} E(R_P) &= W_C E(R_C) + W_F E(R_F) \\ &= 0.50 \times 0.6387 + 0.50 \times 0.3138 \\ &= 0.4763 \end{aligned}$$

Portfolio Risk is,

$$\begin{aligned} \sigma_P &= \sqrt{W_C^2 \sigma_C^2 + W_F^2 \sigma_F^2 + 2W_C W_F \text{cov}(R_C, R_F)} \\ &= \sqrt{(0.50)^2 \times (0.9624)^2 + (0.50)^2 \times (0.7639)^2 + 2 \times 0.50 \times 0.50 \times 0.5853} \\ &= \sqrt{0.6701} \\ &= 0.8186 \\ &= 81.86\% \end{aligned}$$

**o. Assets D and F i.e. HBL and NIBL**

$$W_D=W_F=50\%$$

And the portfolio return will be,

$$\begin{aligned} E(R_P) &= W_D E(R_D) + W_F E(R_F) \\ &= 0.50 \times 0.2776 + 0.50 \times 0.3138 \end{aligned}$$

Portfolio Risk is,

$$\begin{aligned}\sigma_P &= \sqrt{W_D^2 \sigma_D^2 + W_F^2 \sigma_F^2 + 2W_D W_F \text{cov}(R_D, R_F)} \\ &= \sqrt{(0.50)^2 \times (0.4827)^2 + (0.50)^2 \times (0.7639)^2 + 2 \times 0.50 \times 0.50 \times 0.2376} \\ &= \sqrt{0.3229} \\ &= 0.5683 \\ &= 56.83\%\end{aligned}$$