

A STUDY OF PORTFOLIO RISK AND RETURN ON SELECTED COMMERCIAL BANKS

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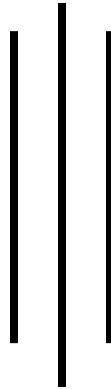
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RECOMMENDATION

This is to certify that the thesis

Submitted by

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Entitled:

A STUDY OF PORTFOLIO RISK AND RETURN ON SELECTED COMMERCIAL BANKS

*has been prepared as approved by this Department in the prescribed format of the
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DECLARATION

I hereby declare that the work reported in this thesis entitled “**A STUDY OF PORTFOLIO RISK AND RETURN ON SELECTED COMMERCIAL BANKS**” submitted to Shanker Dev Campus, Faculty of Management, Tribhuvan University, is my original research work done in the form of partial fulfillment of the requirement for the Degree of Master’s in Business Studies (M.B.S.) under the supervision of Shree Bhadra Neupane and Achyut Bhattarai, of Shanker Dev Campus, Tribhuvan University.

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TABLE OF CONTENTS

Recommendation
Viva-Voce Sheet
Declaration
Acknowledgement
Table of Contents
List of Tables
List of Figures
Abbreviations

CHAPTER I INTRODUCTION

1.1 Background of the Study 12
1.2 Focus of the Study..... 20
1.3 Statement of the Problems 21
1.4 Objectives of the Study 23
1.5 Limitation of the Study 23
1.6 Organization of the Study 24

CHAPTER II REVIEW OF LITERATURE

2.1 Conceptual Review 26
 2.1.1 Portfolio Return and Risk..... 28
 2.1.2 Investment 30
 2.1.3 Investment Process 32
 2.1.4 Investment Alternatives..... 34
 2.1.5 Analysis of Portfolio 38
 2.1.6 Diversification of Portfolio 40
 2.1.7 Systematic and Unsystematic Risk 41

2.1.8 Under And Over Valuation	43
2.1.9 Capital Assets Pricing Model (CAPM).....	44
2.1.10 Security Market Line (SML).....	46
2.2 Review of Books	26
2.3 Review From Journals Articles.....	53
2.4 Review From Thesis	59
2.5 Research Gap	73

CHAPTER III RESEARCH METHODOLOGY

3.1 Research Design.....	74
3.2 Population and Samples of Data	75
3.3 Nature and Sources of Data	75
3.4 Data Collection Techniques	75
3.5 Data Analysis Tools.....	76
3.5.1 Financial Tools	76
3.5.2 Statistical Tools	84

CHAPTER IV DATA PRESENTATION AND ANALYSIS

4.1 Risk and Return of Common Stocks.....	87
4.2 Market Sensitivity of Stocks	92
4.3 Systematic and Unsystematic Risk	94
4.4 Portfolio Analysis	97
4.4.1 CAPM Equation/SML.....	97
4.4.2 Portfolio Risk and Return.....	98
4.5 Portfolio Performance Evaluation.....	100
4.6 Formation of Two-Asset Portfolio (Appendix 4 and 7)	101
4.7 Computation of Risk and Return for Three Assets Portfolio (Appendix 4 and 7)	107
4.8 Major Findings.....	115

CHAPTER V SUMMARY CONCLUSION AND RECOMMENDATIONS

5.1 Summary 118
5.2 Conclusions 122
5.3 Recommendations 124

Bibliography

Appendices

LIST OF TABLE

1.1	List of Commercial Banks	6
2.1	Scheme Diagram of an Investment, Decision Making Process	23
4.1	Calculation of Mean, Variance and S.D of BOK	77
4.2	Calculation of Mean, Variance and S.D of HBL	78
4.3	Calculation of Mean, Variance and S.D of NABIL	78
4.4	Calculation of Mean, Variance and S.D of NIBL	79
4.5	Average Rate of Return, Variance, S.D. and C.V. of Commercial Banks	79
4.6	Covariance and Beta Coefficient of Commercial Banks	82
4.7	Total Systematic and Unsystematic Risk of CS of CB'S and their Proportion	84
4.8	Pricing Situation of the Stock of the Commercial Banks	86
4.9	Portfolio Risk and Return of Commercial Banks	88
4.10	Portfolio Performance Measure using sharp's Measure	90
4.11	Investment in BOK and HBL	91
4.12	Investment in BOK and NIBL	92
4.13	Investment in BOK and NABIL	93
4.14	Investment in HBL and NIBL	94
4.15	Investment in HBL and NABIL	95
4.16	Investment in NIBL and NABIL	96
4.17	Investment in BOK, NIBL and HBL	97
4.18	Investment in BOK, NIBL and NABIL	99
4.19	Investment in BOK, HBL and NABIL	101
4.20	Investment in NIBL, HBL and NABIL	103

LIST OF FIGURES

2.1	The Relationship between Systematic Risk and Unsystematic Risk	32
2.2	Security Market Line	36
4.1	Average Rate of Return, Variance, SD of CB's	80
4.2	Beta Coefficients of Commercial Banks	83

ABBREVIATIONS

AD	=	Anno Domine
AGM	=	Annual General Meeting
APT	=	Arbitrage Pricing Theory
ATM	=	Automated Teller Machine
BOK	=	Bank of Kathmandu
C.V.	=	Co variance
CAPM	=	Capital Assets Pricing Model
CB	=	Commercial Bank.
CBS	=	Commercial Banks
CS	=	Common stock
DBL	=	Dubai Bank Ltd.
DPS	=	Dividend Per Share
EBL	=	Everest Bank Limited
EPS	=	Earning Per Share
FY	=	Fiscal Year
HBL	=	Himalayan Bank Limited
HMG	=	His Majesty Government
HPR	=	Holding Period Return
i.e.	=	That is
M.B.S.	=	Master of Business Studies
MIS	=	Management Information System
MPS	=	Market Per Share
NABIL	=	Nabil Bank Limited
NBBL	=	Nepal Bangladesh Bank Limited
NBL	=	Nepal Bank Limited
NIBL	=	Nepal Investment Bank Limited
NRB	=	Nepal Rastra Bank

NSBO= Nepal Security Board of Nepal
NTC = Nepal Telecom
S.D. = Standard Deviation
SCBNL= Standard Chartered Bank Nepal Limited
SML = Security Market Line
US = United State
VSAT= Virtual Satellite

CHAPTER – I

INTRODUCTION

1.1 Background of the Study

Development of every nation depends on different activities among which economic activities are considered as the backbone of development of the nation. The economy of the nation is strictly based on the proper and efficiency utilization of available natural resources with well planned management, strategy and up to data information. The utilization of resources results in appreciation of the wealth of individual and the nation.

As an outcome of, the economic liberalization policy, his majesty's government has put its face in the international arena by which so many investment opportunities are evolved within the nation integrated and especially development of the nation is possible, only when competitive banking services reach the nook and corners of the nation. Commercial banks occupy an important place in the framework of every economy by providing required capital for the development of industry, trade and business out of the saving collection as deposits, besides, facilitating the economic & social life. Banks are the essential part of the business activities which are established to safeguard people's money and utilizing the money in making loans and investments. In regard to Nepal, there are several commercial banks operating at different places some of the popular commercial banks are as follows:

-) Nabil Bank Limited.
-) Himalayan Bank Limited.
-) Nepal Bank Limited.
-) Nepal Bangladesh Bank Limited.
-) Standard Chartered Bank Limited.

-) Bank of Kathmandu Limited.
-) Nepal Investment Bank Limited.
-) Kumari Bank Limited

Every bank invests its money in some profitable financial sector, which may result in profitable business in the long run. An investment is the commitment of money that is expected to generate additional money. In other words, investment is the sacrifice of existing resources to generate return in the future involving risk. It can be real as well as financial investment real investment refers to the kinds of tangible assets such as land, machinery, factories, building etc. Whereas financial investment leads to invest in the contracts within a piece of paper such as common stock, bond etc.

Considering the well-known proverb “Don’t keep your eggs in a basket” one has to spread the investment in different securities to minimize the risk. It is called the ‘Diversification of Risk’. Whenever there is the matter of investment there exist some degrees of risk. Therefore, if all the eggs are put in a basket and if any of disturbances take place it is certain that all eggs will certainly be broken so as it is not good to put all eggs in one basket Similarly, the investors should not invest all the money in only one security but it should be spread into different securities available to be safe from default or any uncertainty. As a result, the bank also makes its investment in different securities rather than making investing in one security.

Here, diversification in investment represents the portfolio management The portfolio investment is the investment in various securities in order to increase return with reducing risk It is therefore, a selection of optimal alternatives available and attainable that provides highest possible return from lowest risk for specific return.

MEANING OF COMMERCIAL BANK

The commercial banks are those banks, which put together the savings of the community and arrange them for the productive use. Commercial Banks transfer monetary sources from savers to users. They accept deposits from the public on the condition that they pay back on demand or after a certain period. They provide loans and advances from the money, which they receive through deposits. Apart from financing, they also render services like collection of bills and cheques, locker facilities for the valuable goods, financial advice etc to their customers.

FUNCTION OF THE COMMERCIAL BANK

There are many functions of commercial banks. The following are the main functions performed by the commercial banks.

1. Accepting deposits

The commercial banks accept deposits in three categories namely current, savings and fixed deposits.

a. Current deposits

Current deposit is also known as demand deposit under this, any amount may be deposited in this account. The bank does not pay any interest on such deposits.

b. Saving deposits

Saving deposit is one of the deposits collected from small depositors and low-income depositors. The bank usually pays small interest to the depositors against their deposits. This is also called saving account.

c. Fixed deposit

Fixed deposit is the one in which a customer is required to keep a fixed amount with bank for a specific period, generally by those who do not need money for a stipulated period. The bank pays a higher interest on such deposits.

2. Advancing loans

Commercial bank provides loans and advances from the money, which it receives by way of deposits. Direct loans and advances are given to all types of persons against the personal security of the borrowers or against the security of moveable and immovable properties. Banks provides four types of loan mainly, overdrafts, direct loans, cash credit and discounting bills of exchange.

3. Agency services

The commercial bank undertakes the payment of subscriptions, insurance premium, rent etc. it collects cheques, bills, dividends, interest, pensions etc on behalf of customers. The bank charges a small amount of commission for those services. It undertakes to buy and sell securities on behalf of its customers. Commercial bank also acts as a trustee, executor and administrator.

4. Credit creation

Credit creation is very important function of the commercial banks. They accept deposits and advance loans. When the bank advances loans, it opens an account to draw the money by cheque according to his needs. By granting the loans, the bank creates credit or deposit.

5. Others functions

Other functions of commercial banks can be explained as follows:

a. Assist in Foreign

The commercial bank discounts the bills of exchange drawn by Nepalese exporters on the foreign importers and enables the exporters to receive money in the native currency. Similarly, the bank also accepts the bills drawn by foreign exporters.

b. Offer Security brokerage services

Many commercial banks have begun to market security brokerage services offering customers the opportunity to buy stocks, bonds and other securities without having to go to a Security dealer or broker.

c. Financial Advising

Many banks offer a wide range of financial advisory services from helping in financing planning and consulting business managers.

DEVELOPMENT OF COMMERCIAL BANKS IN NEPAL

Nepal's banking history had begun with the establishment of Nepal Bank Ltd in 1937. At that time, this bank had authorized capital of Rs 10 million and paid up capital of Rs 842 thousand. Nepal Bank Ltd was the first commercial bank with 56% government equity Rastriya Banijya Bank came into existence in 1966. Fully government ownership with the authorized capital of Rs 10 million and paid up capital of Rs 25 million

Table 1.1
List of Commercial banks

S.N.	Commercial Banks	Established Date	Head Office
1.	Nepal Bank Ltd.	1937/11/15	Kathmandu
2.	Rastriya Banijya Bank	1966/01/23	Kathmandu
3.	Nabil Bank	1984/07/16	Kathmandu
4.	Nepal Investment Bank Ltd.	1986/02/27	Kathmandu
5.	Standard Chartered Bank	1987/01/30	Kathmandu
6.	Himalayan Bank Ltd.	1993/01/18	Kathmandu
7.	Nepal Bangladesh Bank	1993/06/05	Kathmandu
8.	Nepal SBI Bank Ltd.	1993/07/07	Kathmandu
9.	Everest Bank Ltd.	1994/10/18	Kathmandu
10.	Bank of Kathmandu Ltd.	1995/03/12	Kathmandu
11.	Nepal Credit and Commercial Bank	1996/10/14	Siddhartha Nagar
12.	Lumbini Bank Ltd.	1998/07/17	Naryanghat
13.	Nepal Industrial and Commercial Bank Ltd.	1998/07/2	Biratnagar
14.	Macchapuchhre Bank Ltd.	2000/10/03	Kathmandu
15.	Kumari Bank Ltd	2001/04/03	Pokhara
16.	Laxmi Bank Ltd.	2002/04/03	Kathmandu
17.	Siddhartha Bank Ltd	2002/12/24	Kathmandu
18.	Agricultural Development Bank Ltd.	1968/01/02	Kathmandu
19.	Global Bank Ltd.	2007/01/02	Birgunj, Parsa
20.	Citizen Bank Ltd.	2007/06/21	Kathmandu
21.	Prime Bank Ltd.	2007/09/24	Kathmandu
22.	Sunrise Bank Ltd.	2007/10/12	Kathmandu
23.	Bank of Asia Nepal Ltd.	2007/10/12	Kathmandu
24.	Nepal Development Bank Ltd.	2008	Kathmandu
25.	NMB Bank Ltd	2008	Kathmandu

Source: <http://brf.nrb.org.np>

NABIL BANK LIMITED

Nabil Bank Ltd., the first joint venture bank in Nepal was established in 1984, under the Company Act 1964. Its equity configuration showed that Dubai Bank Ltd (DBL) owned 50% equity partner which was transferred to Emirates Bank International Ltd. Later on, Emirates Bank International Ltd, Dubai sold its entire

50% holding to National Bank Ltd, Bangladesh. So the current configuration is given as follows:

National Bank Ltd., Bangladesh	50%
Nepal Industrial Development Corporation (NIDC)	10%
Rastriya Beema Sansthan	9.66%
Nepal Stock Exchange (NEPSE)	0.34%
Nepalese Public	30%

Being the large equity holder, National Bank Ltd. Bangladesh is managing the bank in accordance with the Technical Service Agreement signed between it (NBL) and the bank in June 1995. [Financial Statements of listed Companies VOL. IV (Nepal Stock Exchange Ltd.1997/98)]

The bank expanded its banking services towards the different and parts of the country by expanding its branches. Besides banking, the other facilities provided are,

-) Credit cards
-) International trade and bank guarantee
-) Tele banking
-) Society for worldwide inter bank financial telecommunications (SWIFT)
-) Safe deposit locker
-) Western Union Money Transfer
-) ATM (Automated Teller Machine)

HIMALAYAN BANK LIMITED

Himalayan Bank Ltd was established under the Company Act 1964, in 1992. Its operation started from 1993, February. Its joint venture partner is Habib Bank Ltd. Its share subscription is as follow:

Promoter Shareholder	51%
Habib Bank Ltd	20%
Financial Institution	14%
Nepalese Public Shareholders	15%

Besides banking the other facilities provided by the bank are as follows:

-) Credit cards
-) Any branch banking
-) ATM (Automated Teller Machine)
-) Tele banking
-) VISA Card
-) 24 hours banking (New Road Branch)

The bank is expanding services by establishing branches both in rural as well as in urban areas.

NEPAL INVESTMENT BANK LIMITED

Nepal Investment Bank Ltd (NIBL), previously Nepal Indosuez Bank Ltd., was established in 1986 as a joint venture between Nepalese and French partners. Its share subscription is as follows:

A group of Companies	50%
Rastriya Banijya Bank	15%
Rastriya Beema Sansthan	15%
General Public	20%

Besides Banking the other facilities provided by the bank are as follows:

-) ATM with any branch banking
-) NTC's mobile bill payment
-) Any branch banking
-) Ezee saving scheme

-) 365 days banking
-) Debit Card and Credit card
-) Tele banking service

BANK OF KATHMANDU LIMITED

Bank of Kathmandu Ltd is established under Company Act 2021 on Mangsir 30th 2050. In the beginning it was established as a joint venture bank with Siam Commercial Bank of Thailand. Its share subscription is as follows:

- | | |
|------------------------------------|-----|
|) Nepalese entrepreneurs | 50% |
|) Siam Commercial Bank of Thailand | 30% |
|) General Public | 30% |

BOK is committed to providing products and services of the highest standard to its customers by understanding their requirements best suiting the market needs. In pursuit to deliver the product and services of the highest standard, BOK is fully equipped with state-of-art technology for appropriate and efficient management information system (MIS) and rendering quality services, VSAT and Radio modem for networking, society for worldwide inter bank financial telecommunication (SWIFT) for International trade and transfer of funds around the world, correspondent banking relationship with over 200 banks worldwide for effective and proficient execution of international trade and remittance activities, gamut of corporate and retail banking products and services and centralized banking operations for better risk management, consistent service delivery and lowering operating cost.

1.2 Focus of the Study

The investment decision is one of the major functions under the financial management. The increasing number of bank and financial institution has created

a competitive environment in the financial sector. The investment opportunity of trade, industry, agriculture and other sector has not comparatively been extended. So, commercial bank has to face so many difficulties to mobilize their fund on profitable sector. The risk is involved in every steps of the return. Every investor wants a maximum return with a minimum level of the risk. So to minimize of risk the investor should diversify its investment by means of portfolio.

In this study trend of investment process of commercial banks in various sectors by the mean of portfolio will be analyzed, the existing investment situation and the investment strategy in future will be analyzed. Our main focus of the study is portfolio analysis of commercial banks.

1.3 Statement of the Problems

After liberalization in economy, Nepalese banking industry was booming until recent past. However, the recent economic slowdown has started affecting the performance of commercial banks. The effect of slowdown is expected more in the forthcoming years. This will lead to an increase in the intensity of competition in the banking industry. It is also facing difficulties in furnishing their loan and advances in profitable sectors. Because of economic recession, only few businesses are able to survive and other which are less competitive are backing out from the market. In such a situation, banks have to be on a safer side, invest their surplus fund in the secured securities, which yield lower rate of return.

However, to earn profit banks have to invest their sources in different productive sector of the investment alternatives. Since there is uncertainty of profit which creates risk, every commercial banks has to diversify their investment to minimize risk.

At present Nepalese commercial banks do not seem to be capable to invest their fund in more profitable sectors where there is also risk. They are found more interested to invest in less risky and liquid sector such as Treasury Bills or Government Securities. This is due to weak investment policy of commercial banks and lack of Portfolio Management. Nepalese commercial banks have not formulated their investment policy in an organized manner. They have no consideration towards portfolio optimization. They just rely upon the instructions and guidelines of Nepal Rastra Bank. They do not have their own clear vision towards investment portfolio. They do not try to pay attention towards proper matching of deposit and investment portfolio, which is creating financial problem in commercial banks

Most of the commercial banks invest their funds in limited area to achieve highest amount of profit. With the prevailing economic condition in the country, there has been lower investment in agriculture, manufacturing, industrial and other productive sectors, which is not satisfactory to meet the economic growth of the present period. They hesitate to invest in long-term projects. They are much more safety minded. Therefore, they follow conservative loan policy.

Further Portfolio Management activities of Nepalese Commercial Banks are in developing stage. The reason behind not using such activities by commercial banks may be due to unawareness about portfolio management and its usefulness, hesitation of taking risk and lack of proper techniques to run such activities in the best and successful manner.

In such situation, thus, this study mainly concerns with the portfolio management of Nepalese commercial banks. This study seeks to find answers the following questions:

- How far have commercial banks been able to transfer monetary resources from saver to user?
- What is the trend of investment in different assets by commercial banks?
- What is the relationship of investment with total deposits, loan and advances, net income etc.?
- Does the investment decision affect the total earnings of the banks?
- How do commercial banks analyze the trend of risk and return using portfolio diversification?
- How far have been commercial banks able to mobilize and utilize domestic resources?
- Is there any other relationship between investment decision and financial position?

1.4 Objectives of the Study

The objectives of this study are to identify the situation of portfolio management of Nepalese commercial banks. The specific objectives of the study are as follows. To study is the existing situation of portfolio management of Nepalese commercial banks.

- To highlight the concept of investment and loans and advances portfolio.
- To analyze the return and risk of the common stocks of sample commercial banks.
- To calculate the proportion of diversifiable and undiversifiable risk over total return on common stocks of the sample commercial banks.
- To analyze the portfolio return and risk of the sample commercial banks with respect to random weights.

1.5 Limitation of the Study

In the context of Nepal, data collection is major problem for study. Every work has restriction and limitation without limitation work is not done sweet and taste.

This study had been made by using certain methodology and based on available data.

This study is simply a partial requirement of M.B.S program so this study is limited by the following factors.

- Among the various CB's, the study focuses only on four CB's namely, BOK, NABIL, HBL and NIBL.
- The study covers the period of five years only i.e. from FY 2002/03 to 2006/07.
- The study is based on secondary data and therefore, the findings are based on the information provided by the banks.
- The utilization tools have their own assumptions.

1.6 Organization of the Study

Following a simple research methodology approach, this study is organized under five different chapters. The title and brief sketch of each chapter is as follows:

Chapter 1: It contains the introduction of the study where it includes background of the study, statement of the problem, objective of the study, Limitation of the study and organization of the study.

Chapter 2: It incorporates theoretical framework and review of the articles, journals and past researches and other empirical studies conducted inside and outside the country.

Chapter 3: It explains the methodology used in the research to arrive at the results in the context of arriving at the objective of the study. It therefore basically deals with the nature and sources of data, research design, method of data collection and statistical tools and techniques used in analysis of data.

Chapter 4: It deals with the analysis of primary and secondary data collected during the study by using different tools and methods and scoring empirical findings out of the study.

Chapter 5: It covers summary, conclusions and recommendations of the study followed by appendices and bibliographical references.

CHAPTER – II

REVIEW OF LITERATURE

Review of literature is the study of the past research studies and relevant materials. It is advancement of existing knowledge and in depth study of subject matter. In literature review, researcher takes hints from past dissertation but he or she should take need of replication.

2.1 Conceptual Review

Review of Books

A portfolio is a bundle of combination of individual assets or securities (*Pandey; 199;329*). If investor holds a well diversified portfolio, then his concern should be the expected return and risk of portfolio rather than individual assets or securities. The portfolio theory provides a normative approach to the investors' decision to investment in assets or securities under risk. Portfolio expected return is a weighted average of the expected return of individual securities but the portfolio is sharp contrast, can be something less then a weighted average of variance. As a result an investor can reduce portfolio risk by adding another security with greater individual risk then any other securities in the portfolio. The seemingly curious result occur because risk greater on the covariance among the return of individual securities.

Portfolio analysis is to develop a portfolio that has the maximum return at whatever level of risk the investor deems appropriate. A portfolio is a collection of investment securities (*Weston and Brigham; 1982;456*). The portfolio of asset usually offers advantages of reduction risk through diversification. A stock or securities held, as part of a portfolio is less risky than the same stock held in

isolation. The objective of portfolio analysis is to develop a portfolio that has the maximum return at whatever level of risk the investor deems appropriate.

Most financial assets are not held in isolation, rather they are held as parts of portfolios. Portfolio theory deals with selection of optimal portfolios i.e. portfolios that provide the highest possible return for any specified degree of risk or the lowest possible risk for any specified rate of return (*Weston and Copeland; 1988;366*).

Portfolio management is the process of selecting a bundle of securities that provides the investing organization a maximum yield for a given level of risk or alternatively ensuring minimum level of risk for a given level of return. It can be also taken as risk and return management. Its aims to determine an appropriate asset mix which attains optimal level of risk and return. The objective of portfolio management is to analyze different individual assets and delineate efficient portfolios. The group of all efficient portfolios will be called the efficient set of portfolios. The efficient set of portfolios comprises the “efficient frontier”. The efficient frontier is the locus of points in risk –return space having the maximum return at each risk class. The efficient frontier dominates all other investments.

Portfolio theory was originally proposed by Harry M. Markowitz in 1952 A.D. (*Cheney and Moses; 1992;8*). The theory is concerned with selection of an optimal portfolio by a risk averse investor. A risk adverse investor is an investor who selects a portfolio that maximizes expected return for any given level of risk or minimizes risk for any given level of expected returns. A risk adverse investor will select only efficient portfolios. Portfolio theory can be used to determine the combination of these securities that will create the set of efficient portfolios. The selection of the optimal portfolio depends on the investor’s performance for risk and return.

2.1.1 Portfolio Return and Risk

Portfolio risk and return measured during the time interval is required. Two kinds of risk can be estimated the portfolio (a) market risk or systematic risk measured by its beta (b) total risk, measured by its standard deviation. The total risk is the combination of systematic risk and unsystematic risk.

Return on Portfolio

The expected return on the portfolio is simply a weighted average of the expected return of the individual security that they are included in the portfolio the weights are equal securities (the weight must sum to hundred percent or one) the general formula for expected return of a portfolio, R_p is as follows.

$$R_p = \sum W_j R_j$$

Where,

W_j = Proportion or weight of total fund invested in security j

R_j = Expected return for security j

n = Total number of different securities in the portfolio

For The investment on two assets the formula will be as follows.

$$R_p = W_A R_A + W_B R_B$$

Where,

R_p = Portfolio Expected Returns

R_A = Expected Return on Security A

R_B = Expected Return on Security B

W_A = Weight on Security A

W_B = Weight on Security B

Risk on Portfolio

Risk of portfolio is not the weighted average of the standard deviation of specific securities composing that portfolio. It rather depends upon the co-movement (interactive risk) among the security as well. Portfolio risk can be measure in terms of standard deviation and variance.

Mathematically,

$$\sigma_p = \sqrt{\sum_j \sum_k W_j W_k \text{Cov}_{jk}}$$

Where,

n = Total number of different securities in portfolio

W_j = Proportion of Total Funds invested in security J

W_k = Proportion of total funds invested in security K

COV_{jk} = Covariance between the possible return of security J and K

The covariance of the possible return of two securities is the measure of the extend 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 follows.

$$\text{COV}_{jk} = \rho_{jk} \sigma_j \sigma_k$$

where,

ρ_{jk} = The correlation coefficient between possible return for security j and k

σ_j = S.D. Of security j

σ_k = S.D. Of security k

The correlation coefficient that is significant in portfolio construction is standardized statistical measure of the linear relationship between two variables. Its range will be -1 to $+1$ (Perfectly Negative Correlation to Perfectly Positive Correlation.).The Positive correlation coefficient shows that he returns from two securities generally moves in the same 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 linear equation.

2.1.2 Investment

Investment may be defined as a sacrifice of current rupees for future rupees. Two different attributes are generally involved in investment i.e. time and risk factor. The sacrifice takes place in the present and is certain. The reward comes later if at all, and all the magnitudes is generally uncertain. An investment is the commitment of funds made in the expectation of some positive rate of return. We have heard the word "investment" because it has become a household word and is very popular with people from all walks of life. While investing future return one should forget the amount he/she investing i.e. capital, a collective form of surplus. The surplus is that part of money deducting all the expenses from income. A person spends his/her years in capital formation process. That is why each one should be rational while investing since most of the investors are risk averters they require additional unit of returns for bearing one more level of risk. People always tries to reduce risk factor common definitions says that contribution of present values for future is investment or it is a research of certainty within uncertainty.

"An investment is the commitment of funds made in the expectation of some positive rate of return. If the investment is properly under taken will be commencement with the risk that investor assumes"(Fisher and Jordan; 1970;256)

"Investment in its broadest sense means that sacrifice of current dollars for future dollars. Two different attributes are generally involved in time risk. The sacrifice takes place in present and is certain. The reward comes later, if at all, and the magnitude is generally uncertain"(Sharpe, Alexander and Bailey; 2003;11-15).

There are many sources available for investment opportunities such sources may be securities, real estate business and so on. However, in the sense of finance, the term investment is to make investment in securities. The securities may be equity share, preference share, bond debenture, option, treasury bills or whatever the form of security. Investor should have sound knowledge about the trading market of security making investment on securities. The market trading of securities takes place is called security market. Based on the types of assets invested there are two types of investment. They are as follows.

a) Real Investment

An investment made in real or tangible assets such as land, building, furniture & fixtures, precious metals, collectibles, vehicles etc. is called real investment. Real assets have productive capacity. The capital formation is the direct outcome of this productive investment. Nepalese middle class family is more attracted in real investment, due to degrading economic condition they prefer future safety.

b) Financial Investment

Investment in Financial assets like common stock, bond etc. is called financial investments. Financial assets represent financial claims. It is assets that are usually documented by some form of legal representation although the financial assets are typically represented by tangible certificates of ownership. The financial assets itself is intangible. They are also called securities. This research is more concerned with financial investment.

The real and financial investments are complementary with each other. They are not competitive.

2.1.3 Investment Process

The investment process describes how an investor makes decisions what securities to invest in, how extensive investment should be, and when they should be made. There are five steps involve in investment process.

a) Set Investment Policy

It is the first step of investment policy where the plans are made for where, when and how to make investment. A policy refers to the guidelines of activities to be done and the objective to be achieved. By the term investment policy we understand that setting proper investment objective such as how much money to be invested, for much period to be invested, what is degree of risk tolerance?

b) Perform Security Analysis:

After setting the proper investment policy we have to select the security that matches his/her objective, for that there is a need of analyzing the available security. Analysis can be done in two ways:

i) Technical Analysis:

When security market price is analyzed and investment decision is taking accordingly, it is called technical analysis. The person who involve in such work of technical analysis is called technician. The technician prepares bars and chart of stocks pricing over the time. He /she may also find average and moving average price of securities. So, he/she is rightly called "chartists".

ii) Fundamental Analysis:

Under this analysis investor analyzes or analyzed fundamental variables of securities such as EPS, DPS, Growth Rate etc. and takes decisions accordingly. The analyst compute a "justifiable value" or intrinsic value of security at a point of time or compute it with existing market price, whether they are overpriced or under priced.

c) Construction of Portfolio

Simply the term portfolio implies combination of securities for investment with an objective of reducing risk. If the fund is invested more than a single security, the risk can be diluted or spread. There is a saying "Don't Put All The Eggs In A Single Basket (Security)." Portfolio combination is based on the same philosophy. Therefore once an investor analyses the same security, he or she should maintain (construct) an investment portfolio.

d) Revise the Portfolio:

An investment portfolio set at a point of time in a context may not be appropriate forever. There is need to revised it in due course of time. Revising the portfolio means the inefficient security and buying other efficient securities to include in our portfolio.

e) Evaluate the Portfolio

The portfolio constructed or revised should be evaluate in terms of its risk and return. There are different techniques available for evaluation but directly or indirectly all the techniques are based on risk and return step (4) and (5) can be interchange.

Table:2.1

Scheme Diagram of an Investment, Decision Making Process

Step First: Investment Policy		
❖ Determination of Investing Wealth		
❖ Determination of Portfolio Objective		
❖ Identification of Potential Investment Assets		
❖ Consideration of Attributes of Investment Assets		
❖ Allocation of Wealth To Assets Categories		
Step Second: Investment Analysis		
Analysis of The Economy		
Common Stock Analysis	Bond Analysis	Other Assets Analysis
Screening of Industries	Analysis of Yield Structure	Qualitative Analysis
Analysis of Industries	Consideration of Bond Rating	Quantitative Analysis
Qualitative Analysis of Stock	Qualitative Analysis of Bond	
Quantitative Analysis of Stock	Quantitative Analysis of Bond	
Step Third: Investment Evaluation		
<u>Valuation of Stocks</u>	<u>Valuation Of Bonds</u>	<u>Valuation Of Assets</u>
Step Fourth: Portfolio Construction		
❖ Determination of Diversification level		
❖ Consideration of Investment Timing		
❖ Selection of Investment Assets		
❖ Allocation of Investing Wealth To Investment Assets		
❖ Evaluation of Portfolio For Feedback		

(Source: Smith and Eiteman; 1974;286)

2.1. 4 Investment Alternatives

There are various alternatives of investment. They are as follows:

a) Preferred Stocks:

It is the fixed income security. Company pays dividend at predetermined rate to preference shareholders. Preference shareholders have priority in dividend distribution and liquidation. Preferred stock is a hybrid security because preferred stock has fusion qualities of bond and equity. A preference shareholder does not have voting right. It is suitable for those investors who does not want to bear high risk but wants fixed return.

b) Treasury Bills:

Treasury bills are an obligation issued by government, sold at a discount from face value. Treasury bills issued for 91 days except in some exceptional case. In Nepal, Nepal Rastra Bank issues treasury bills on behalf of government. Government issues treasury bills to decrease liquidity from market.

c) Bond:

Bond is also a fixed income security. Company pays interest to bond at predetermined rate to holders. The contract paper of bond is debenture. Debenture holders do not have owner rights and voting rights. It is also suit for that investor who does not want to bear high risk and fixed return on their investments. There are different varieties of bond.

i) Corporate Bond:

Debt obligations issued by corporations are called corporate bonds. Many types of corporate bond exist; they differ in the way the principal and interest payments are made in the collateral used to back. They have strong legal provisions in the liquidation of the company.

ii) Government Bond:

Government bonds are the fixed income securities issued by government. These securities are among the safest of all investments and provide nominal interest. NRB issues government securities on behalf of government in Nepal. Saving bonds, Citizen saving bonds and treasury bonds are example of government bonds in Nepal.

iii) Municipal Bonds:

Municipal bonds are debt obligations issued by state or local governments and agencies. Revenue bonds and general obligation bonds are the example of such

bonds. In Nepal, municipal bonds are not in practice, however it is a good investment alternative.

d) Derivative Securities:

Securities that derive their value from the value of an underlying asset are called derivative securities. Options, commodity futures, financial futures, warrants, rights, etc are the examples of such securities. These securities are the good investment alternatives in the developed stock market but in Nepal they are not in practice.

e) International Investments:

International investment is the investment by individual in debt or equity securities issued by organizations outside the country of residence of the investors. Multinational organizations, foreign stocks traded on a local exchange etc. are its examples.

f) Common Stocks:

The common stock entitles its holders as an owner of the company. Common stock represents owner position in the corporation. It has a residual claim, in the sense that creditors and preference shareholders can receive payments only after the payment of all other claims with preferential basis. Common stock shareholders bear high risk but limited liability. In bankruptcy common stock holders are in the principal entitled only to any value remaining after all prior claims have been satisfied.

"All the shares, with the exception of preference shares, are regarded as equity shares (common stock) ". In Nepal as the provision of Nepal Company Act 2053, the par value of share should be Rs. 10 or Rs. 100. The issuance trend of common stock in Nepalese company is Rs.100 per share.

The market value of common stock is the value determined by demand and supply of the market. Market value fluctuates regularly by the influence of the investment environments. The value of the common stock includes amount retained, intrinsic values of the shares and amount of profit gained after the payment of dividend and other non-operating income.

i) Return on Common Stock

Return is the reward for waiting and risk bearing. Each and every investor invests their funds in long-term securities for the future returns for long run. So, return is most important outcome from an investment.

a) Holding Period Return

The holding period returns refer to the return from holding and investment over some period as cash payment received due to ownership and the change in the market derived by beginning price. If an investor purchases a stock of any company and holds it for certain period, he/she can get return in two ways one is increase in the value of that stock as compared to initial one and another is direct cash payment. The length of period over which an investor assumed to hold the investment during that period is holding period rate of return. The rate of return involves the both capital gain and dividend gain within that holding period return. In general we calculate HPR for the period for the period of one year or that is one accounting period. It represents a rate of return for specific period. It is not necessary that holding period must be one year it is general practice only.

b) Required Rate of Return:

Required rate of return refers to the minimum return that an investor expects at least not to suffer from loss. If investor postponed his satisfaction for uncertain future investment should compensate his satisfaction. The compensation, he demands on behalf of future uncertainty over the risk free rate, is the required rate

of return. The capital markets determined this rate based upon the supply of money to be invested related to the demand for borrowed money.

c) Expected Rate of Return:

Expected rate of return is the return that the investor expects from his investment in future. The expected rate of return should be higher than that of required rate of return. The expected rate of return is based upon the expected cash receipts over the holding period and expected year-end selling price of the securities. The expected rate of return can be estimated by analyzing the trend of return of previous period and by using probability distribution of returns. Expected rate of rate are based on probabilities and theoretical data's.

ii) Risk on Common Stock

Generally the risk can be defined as the probability of the occurrence of unfavorable outcomes or bad occurrence of unfavorable outcomes or bad occurrence. Risk is always associated with the investment. Many investor considers, risk as a chance of happening some unfavorable event of danger of loosing some value. Risk is the product of uncertainty; it depends upon the variability in the cash flow. Although risk from uncertainty its magnitude depends upon the degree of variability in uncertain cash flow and it is measured in terms of standard deviation & variance. The most common measure of risk is variance. Standard deviation and variance are equally and conceptually equivalent quantitative measure of asset's total risk.

2.1.5 Analysis of Portfolio

A portfolio is the combination of investment assets. It is an investment made on two or more than two assets. Portfolio is the holding of securities and investment in financial assets viz. bond stock etc. In portfolio, investor analyzes the future return of securities. The objective of portfolio investment is to develop a

combination that provides minimum return at chosen level of risk. Efficient portfolio always provides the highest possible return for any specified degree of risk and lowest possible risk for any specific rate of return. Portfolio management is related to the efficient portfolio investment in financial assets. We can diversify and minimize risk to some extent by managing portfolio. The main objective of portfolio is to maximize the return and minimize the risk. Overall objective of the portfolio includes generate regular and stable income, safety of investment, tax benefit, appreciation of capital etc.

The portfolio manager seeking efficient investment works with two kinds of statistics, expected return statistics and risk statistic. While talking about the portfolio let's us discuss about the mode of investment. Portfolio investment is the investment in the various securities i.e. portfolio in the collection of security to diminish the degree of risk. Portfolio is the tool for decision-making. It is a selection of optimal alternatives available and attainable that provides highest possible return from lowest possible risk for specific return. Portfolio theory helps in rational investing for desired return. If the fund is invested in more than a single security risk can be diluted or spread. There is a saying "Don't put all the eggs in a single basket". Portfolio construction is based on the same philosophy. Therefore once an investor analyses the security he or she should maintain (construct) an investment portfolio. Anything harmful to the company may cause the ultimate defeat of investment.

Diversification is an attempt to reduce the risk by investing among various financial instrument and industries. Most investment professionals agree that, although it does not guarantee that against less. Diversification is the main important step to reaching your long-range financial goals minimizing risk. We can reduce risk associated with individual stocks, but general market risks effect nearly stock. So, increasing the number of stocks in portfolio will not make

immune to loss. Diversification helps to eliminate of some degree of total risk. Since diversification risk can be avoidable investor did not compensated for bearing such risk, it happens due to unprofessional and internal problems. Investor will be rewarded only for taking market risk, which is also known as unavoidable risk systematic risk. Diversification in the investment or making portfolio in the security level or in industry level product against volatility and uncertainty at rate of return.

2.1.6 Diversification of Portfolio

There are different diversifications techniques for reducing portfolio risk.

i) Simple Diversification:-Simple Diversification of portfolio can be defined as "Not putting all the eggs in a single basket" or spreading the risk. In this diversification, investor randomly selects the securities and makes investment. Simple diversification was analyzed using random selection and equal weighting to stimulate the techniques of naive investor might employ. Using these naive techniques to implement simple diversification does not modify its ability to reduce risk in a diversified portfolio.

ii) Diversification across Industry:

Some investment counselors advocate selecting securities from different industries to achieve better diversification. It is certainly better to follow this advice than to select all the securities in a portfolio from one industry. In this diversification, investors select securities from various industries and make investment. Nevertheless, empirical research had shown that diversifying across industries is not better than simply selecting securities randomly.

iii) Superfluous Diversification

In this diversification, investor selects more than 10 to 15 different securities to make investment. It needs high knowledge, maximum calculation and analysis. Superfluous diversifications will usually results some portfolio management problems such as impossibility of lackluster performances, high search costs, high transactions costs etc.

iv) Simple Diversification Across Quality Rating Category

Simple Diversification across quality rating categories is investing in only same qualities and same rated securities. Such as NEPSE has rated security grade "A" and so on in this portfolio investor will make in same category security.

v) Markowitz Diversification

Markowitz diversification may be defined as combining assets, which are less than perfectly positively correlated in order to reduce portfolio risk without sacrificing portfolios return. It can sometimes reduce risk below the undiversifiable level. Markowitz diversification is more analytical than simple diversification and considers assets correlation. Lower the correlation between the assets, the more that Markowitz diversification will be able to reduce the portfolio's risk. Applying diversification to a collection of potential investment assets with a computer is Markowitz portfolio analysis. It is a scientific way to manage a portfolio and its results are quite interesting. Since, Markowitz portfolio analysis considers both the risk and return of dozen and hundreds of different securities simultaneously. It is a more powerful method of analyzing a portfolio than using institution.

2.1.7 Systematic and Unsystematic Risk

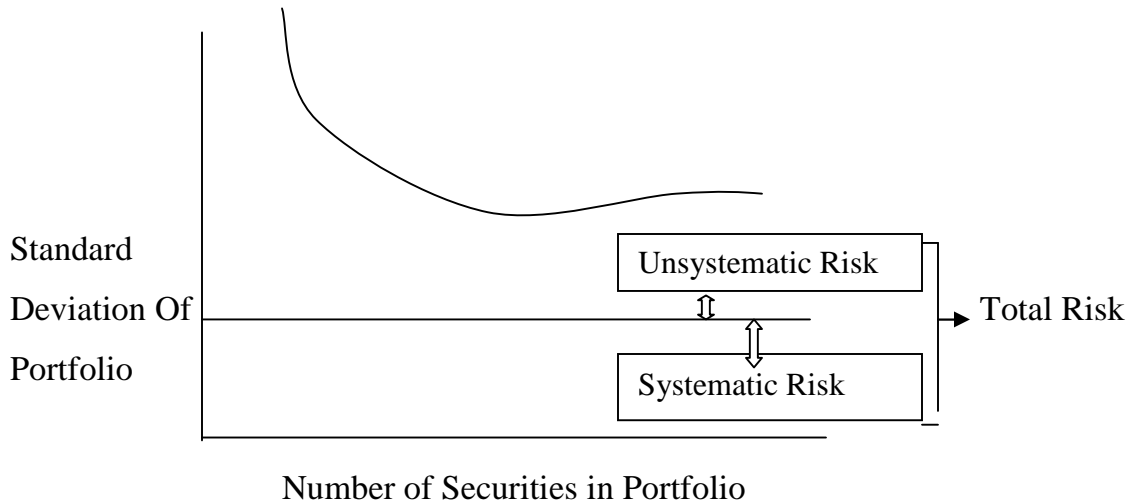
Each an every organization suffers risk because investment is a part of economics and economical cycle changes frequently. The total risk associated with the investment can be classified as systematic and unsystematic risk.

Systematic risk is also called undiversifiable risk. Changes due to economic, political and sociological environment that affects security market are the sources of systematic risk. These types of risk will be beyond the control of management of any organization. It is also well known for unavoidable risk. The systematic lie on the overall stock within the market measured by beta (β). The beta of the stock is the slope of the characteristics line between return for the stock and those for the market. Beta depicts the sensitivity of the security's excess return to that of the market portfolio. If the slope is one, it means that excess vary proportionately with the excess return for the market as a whole. If the slope steeper than one means that the stock's excess return varies more than proportionately with the excess return of market portfolio. In other words it is more systematic risk than the market as whole. This type of stock often called aggressive stock and slopes less than 1 called defensive stock.

Unsystematic risk is that type of risk that can be diversified totally and also avoided to some extent if diversification is efficient. Due to various unsystematic factors with in the organization such type of risk arises. This type of risk will be within the control of management body of organization. Event such as labor strikes, management errors, inventories, advertising, campaigns, shifts in consumer taste and lawsuits cause unsystematic variability in the value of market assets.

Figure : 2.1

The Relationship between Systematic Risk and Unsystematic Risk



2.1.8 Under And Over Valuation

Here, the term under and over valuation means the price of stock is low or high as per their return. In market equilibrium, the CAPM implies and expected return and risk combinations that places it above the security line, it will undervalue in the market. It provides an expected return in the excess of that required by the market for the systematic risk involved. As a result the security will be attractive to the investors. According to the theory, the increase demand will cause the price to rise until the expected return declines sufficiently for the security to lie in the security market line and there by an overvalued security characterized by an expected return risk combination that places it below the security market line. This security is unattractive, holding will sell it, and those not holding it will avoid it. The price will fall and expected return will rise until there is consistency with the security line and with equilibrium pricing.

2.1.9 Capital Assets Pricing Model (CAPM)

A financial model called the capital assets pricing model is the important analytical tool in the both managerial finance and investment analysis. CAPM defines what will be the market premium when beta will not equal to zero or one. CAPM model provide us a means by which to estimate the required rate of return on a security. On a basis of price and dividend data, expected return can be calculated with comparison of these two returns. Investor can analyze whether the stock is under priced or overpriced. CAPM sacrifice the relationship between risk and required rate of return when they held in well-diversified portfolios. The CAPM considered the backbone of modern place theory for financial markets. It is also widely used in empirical analysis, so that the abundance of financial statistical data utilized systematically and efficiently. Moreover, this model is applied in practical research and has thus become an important basis for decision making in different areas. This related to the fact that such studies require information about firm's cost of capital, where the risk premium is an essential component. Investor bears risk only he finds compensation for bearing risk otherwise he invests in risk free assets.

Treasury bills are generally considered as risk free assets. The CAPM relates equilibrium expected return to each level of systematic risk. These expected returns can be interpreted as the appropriate discount rates, as the cost of capital, or as equilibrium rate of return that investor expects for that amount of systematic risk.

Systematic or undiversifiable risk is the main factor risk- averse investors should consider in deciding whether a security yield enough rate of return to induce them to buy it. Other factor such as the "glamour" of the stock and the companies financial ratios, are important only to the extend they affect the security's risk and return. The CAPM graphically represents the tradeoff of systematic risk for return that investors expect and entitle to receive.

The beta coefficient of Treasury bill is zero, which denotes that there is no systematic risk. The return of the Treasury bill is unaffected by market environment. The market portfolio is the combination of all the securities available in the market. The beta coefficient of the market portfolio is the market risks i.e. one. Beta coefficient of a security is the security's covariance with the market portfolio divided by the variance of the market portfolio. CAPM models states that the expected risk premium on each investment is proportional it is beta. The equilibrium of CAPM is:

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

Where,

K_j = Required rate of return on stock j

R_f = Risk free rate of return

$E(R_m)$ = Expected rate of return on market portfolio.

β_j = Beta Coefficient of stock j

The CAPM has some assumptions. (Sharpe, Gordon and Bailey; 2003;4)

They are as follows.

- i) All assets are tradable in the world.
- ii) All assets are infinitely divisible.
- iii) All investor in the world collectively hold all assets.
- iv) For every borrower, there is a lender. There is a risk less security in the world.
All investor borrow and lend at the risk less rate.
- v) Preferences are well described by simple utility functions.
- vi) Evaluating meter of the portfolio investor is expected return and standard deviation of portfolio over a one-year period horizon.
- vii) Investor never repeats, in two identical portfolio's expected returns: they will choose the one with higher expected return.

- viii) Investor never repeats, in two identical portfolio's expected returns: they will choose the one with lower degree of risk i.e. standard deviation.
- ix) Risk free rate is equal to all investors.
- x) All the investor has equal investment horizon.
- xi) Market is perfectly competitive and all information of the companies is available in the market.
- xii) Investors have some homogeneous expectation meaning that they have the same perception concerning the expected return, standard deviation and covariance of securities.

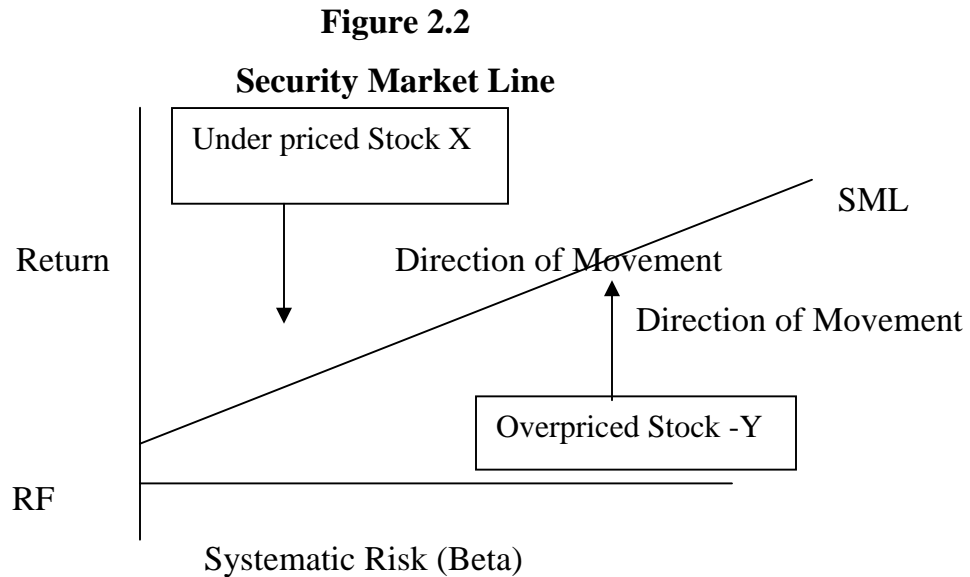
Beta: -

Beta is the measure of percentage change in security return as a result of one percentage change in excess market return .It tells in how much systematic risk a particular assets has relatively to an average assets. Therefore, beta is a key element of the CAPM; mathematically the beta coefficient of a stock is the stocks covariance with the market portfolio divided by the variance of market portfolio. 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 higher the beta higher the risk premium and the total required rate of 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 proxy for general economic factor.

2.1.10 Security Market Line (SML)

SML represent the risk premium of portfolio with different betas. SML is the graphical representation of the CAPM. It shows the relationship between risk and required rate of return. The investor receives no added return for bearing the diversifiable risk. If stocks are under priced, lie above the SML and if stocks are overpriced lie below the SML.CAPM states the risk premium lies in the SML because the risk premium depends on the beta of the security. In addition, the

expected rate of return helps to accurately measure the rate of return of each security. The following diagram shows the SML overpriced and the under priced stocks.



(Sources: Van Horne and Wachowicz;.....:)

In above diagram fig 2.2, it clarifies that stock x is under priced relative to the security market line 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 lower return than that required compensating for its systematic risk. Investors seeing the opportunity for the superior return by investing in stock X will rush to buy. This action will drive the price up and expected returns come down. How long would this continue? 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, investor holding this stock will start to sell it, recognizing that they would obtain a higher return for same amount of systematic risk with other stocks. This selling pressure would drive Y's market down and its expected return goes up until the expected return matches on the SML, market equilibrium will prevail.

Markowitz's Portfolio Selection Model

Markowitz's approach begins by assuming that an investor has a given sum of money to invest at the present time. Markowitz's approach considers the single period rate of return. Single period rate of return is simply the total return an investor would receive during the investment period or holding period. Harry M. Markowitz infused a high degree of sophistication into portfolio construction by developing a Mean variance model for the selection of portfolios, portfolio managers used rules of thumb and intuitive judgment (Markowitz; 1952;77-91).

Markowitz used mathematical programming and statistical analysis in order to arrange for the optimum allocation of assets within the portfolio. To reach these objectives, Markowitz generate portfolio within a reward context. In other words, he considers the variance in the expected returns from investment and their relationship to each other in constructing portfolios. Markowitz model is a theoretical framework for the analysis of risk return choice. Decisions are based on the concept of efficient portfolios.

A portfolio is efficient when,

Offer maximum expected return for varying level of risk, and

Offer minimum risk for varying level of expected return (William and Gordon, Bailey; 2001;13-17).

Assumptions of Markowitz's Portfolio Selection Model

The portfolio selection model developed by Markowitz this model is based on the several assumptions regarding investor behaviour (Bhalla;2001;550).

- Investor considers each investment alternative as being represented by a probability distribution of expected return over some holding period.
- Investor maximizes one period-expected utility and posse's utility curve, which demonstrates diminishing marginal utility of wealth.

- Individual estimates risk on the basis of variability of expected returns.
- Investors base decisions solely on expected return and variance of return only.

According to the Markowitz, the investors should maximize expected return; this rule implies that the non diversified single security portfolio with the highest expected return is the most desirable portfolio. Expected rate of return of any assets is the weighted average rate of return, applying the probability of each rate of return as the weight. The portfolio return is the weighted average expected return of the individual stocks in the portfolio, with weights being the fraction of the total portfolio invested in each stock (Weston and Brigham; 1992;183).

The portfolio expected return is defined in equation as follows:

$$R_P = W_A R_A + W_B R_B + \dots + W_N R_N$$

Where,

R_P = Portfolio Expected Return

W_A = Weight Of investment invested in Stock " A"

W_B = Weight Of investment invested in Stock "B"

R_A = Expected return of stock "A"

R_B = Expected return of stock "B"

According to Markowitz, the portfolio risk is measured by either variance or the standard deviation of return. "The portfolio risk is affected by the variance of return as well as the covariance between the returns of individual assets included in the portfolio and respective weights"

The variance of return from portfolio made up an asset is defined by following equation;

The Sharpe : The Single Index Model

William F. Sharpe published a model simplifying, the mathematical calculations required by Markowitz Model. However, conceptually, its application remained several limitations. Sharpe assumed that, for the sake of simplicity, the return of a security could be regarded as being linearly related to a single index like the market index. The mechanical complexity of the Markowitz's portfolio model kept both practitioners and academics away from adopting the concept for practical use. As a result, what is referred to as the Capital Assets Pricing Model (CAPM) was developed.

Assumptions

The assumptions for CAPM are as follows :

- 1) Investors evaluate portfolios by looking at the expected returns and standard deviations of the portfolios over a one period horizon.
- 2) Investors are never satiated, so when given a choice between two otherwise identical portfolios, they will choose the one with the higher expected return.
- 3) Investors are risk averse, so when given a choice between two otherwise identical portfolios, they will choose the one with the lower standard deviation.
- 4) Individual assets are infinitely divisible, meaning that an investor can buy a fraction of a share if he or she so desires.
- 5) There is a risk free rate at which an investor may lend (that is , invest) money or borrow money.
- 6) Taxes and transaction costs are irrelevant.

To these assumptions the following ones are added;

- 7) All investors have the same one-period horizon.
- 8) The risk free rate is the same for all investors.
- 9) Information is freely and instantly available to all investors.

- 10) Investors have homogeneous expectations, meaning that they have the same perceptions in regard to the expected returns, standard deviations and covariances of securities.

The Stephen study or Arbitrage pricing theory

CAPM is based on only a single factor of the average market performance, and it is based on some unrealistic assumptions. Such a reservation on the part of the user called for a new model. Stephen A. Ross's multifactor model (1976), called an Arbitrage pricing theory (APT). The name arbitrage pricing theory arises from the assumption that investors will arbitrage away any differences in the expected return on assets that have the same risks of course, the same assumptions underlines the standard CAPM. The basic assumptions of APT is not that investors are mean variance maximizers but rather that returns are affected by systematic factors and the return on any assets over time is called the return generating process

The APT is said to be superior on the ground that it is more general than CAPM. CAPM assumes that the rate of return on a security is influenced by only one factor that is the average market performance. Unlike CAPM, the APT assumes that the rate of return on a marketable security is a linear function of the movement of a set of economic factors common to all securities. The random rate of return under APT model is a linear function of k factors as follows;

$$R_j = E (R_j) + b_{j1} F_1 + b_{j2} F_2 + \dots + b_{jk} F_k + e_j$$

Where,

R_j = Random Rate of return on stock j

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

b_{jk} = Sensitivity of stock j's return to kth factors

F_k = Mean zero kth factor common of the return of all assets under consideration

e_j = Random error term including the unique effect on return

The FK is the mean zero random variable of the factor and it is the result of the deviation of realized value from the expected value. The error term, e_j is the unique or unsystematic risk which can be eliminated through diversification and does not affect the stock rate of return. The name Arbitrage refers to the market condition where two or more securities of identical factor sensitivities are period differently, providing opportunities to make profit by selling overprice securities short and buying under-priced securities long. Such transaction are called arbitrage and they allow market participants to make profit without investment and without assuming any risk through short selling and buying long for the amount equivalent to the short selling. Such opportunities rarely exist in an efficient market and no one can benefit from arbitrage transactions. Otherwise, prices will continue to change until the expected return from such transaction is zero. Therefore the expected arbitrage profit is zero in the long run if the market functions efficiently. The APT is based on this very principal of “no investment, no risk and no return.”

The APT states that if no arbitrage opportunities exist in the market, the assets pricing is a function of risk free rate and a set of relevant factors related risk premium. It is, therefore, true that the APT is not different from the CAPM which also states that the return on a security is equal to the risk free rate and risk premium for the market related factor, such as inflation, GDP, tax laws etc. Hence, accounting of market rate of return does reflect the consideration of many economic factors that influence all assets in the market. Given this argument, we can say that there should be significant different in expressing the rate or return either using only the market rate of return or using specially all the factor affect the market. We can see that APT logic is not much different from the logic used in the CAPM. Similar to CAPM, only the set of systematic risk is priced in the above model, and no price is assigned for the diversifiable risk. The risk premium

for the systematic risk of each factor is determined as the market price per unit of risk multiplied by the degree of factor's systematic risk.

2.2 Review of Journals/Articles

The article in the web page www.investopedia.com "*Are you Over Diversified*" mentioned that many individual investors could not tolerate the short term fluctuation in the stock market. Diversifying the portfolio is the best way to smooth out the ride. Diversification is the risk management techniques that mix a wide variety of investments within a portfolio in order to minimize the impact that only one security will have on the overall performance of the portfolio. Diversification low the risk of your portfolio. Academics have complex formulas to demonstrate how this works.

Chatarjee in the article "*Selection of Portfolio*" in the web page www.indiainfoline.com mentioned some guideline to select optimal portfolio. He mentioned that investor like high-expected return for given level of risk is efficient portfolios. If an investor wants to know the marginal impact of the stock on the risk of the portfolio, then he/she must not looks at the risk of that stock in isolation but rather at its contribution to portfolio risk. That is dependent on the stocks sensitivity to changes in the value of the portfolios. If the investor can borrow and lend at the risk free rate of interest, then they should always hold a mixture of the risk free investment and one particular common stock portfolio. The composition of this portfolio depends on when the investment liquidated. Risk is lower in the short term. Diversification of the portfolio can reduce the unique risk. If such diversification results an expected portfolio return or risk level that is below/above the desired level then, then borrowing and lending can be used to achieve the desired level. Portfolio strategy should be module according to the need of each individual investor. Since each portfolio provides an expected return based on a particular level of risk, while constructing portfolios, care should be taken to

ensure that the portfolio does not exceed the risk bearing capacity of the investor. It is constructed in such a way that it provides the highest return for a given acceptable level of risk. In an efficient portfolio, there is a straight-line relationship between the expected return and the marginal contribution to portfolio risk. This is true because an investor would include a security, which contributes to increasing the risk of the portfolio as a whole only when it offers higher return and increases the expected return of the portfolios.

Mahat (28th April; 2004), in the article of "*Effective Banking*" published in Kathmandu Post. He explained that the efficiency of banks could be measured using different parameters. The concept of productivity and profitability can be applied while evaluating efficiency of banks. The term productivity refers to the relationship between the quality of inputs employed and the quality of outputs produced. An increase in productivity means that more output can be produced from the same inputs or the same outputs can be produced from the less inputs. Interest expenses to interest income ratio shows the efficiency of banks in mobilizing resources at lower cost and investing in high yielding assets. In other words, it reflects the efficiency in the use of funds. The operating profit to total income ratio helps in assessing whether banks are doing the right things internally. According to Mr. Mahat the analysis of operational efficiency of banks will help one in understanding the extent of exposure of banks under the changed scenario and in deciding when to back up. This may also help the inefficient bank to upgrade their efficiency and be wired in the situation developing due to slowdown in the economy. The regulation should also be concerned on the fact that the banks with unfavorable ratio may bring catastrophe in the banking industry.

Shrestha (2005), An article entitled "*Portfolio Management in Commercial Banks*" published by business journal. In this article he mentions a short transitory view on portfolio management in Nepalese commercial banks. Now a day number

of banks and financial institution are operating in this sector are having greater networks and access to national and international markets. They have to go with their portfolio management very seriously and superiority, to get success to increase their regular income as well as to enrich the service to their clients. In this competitive and market oriented open economy, each commercial banks and financial institution has to play a determining role by widening opportunities for the sake of expanding provision of best service to their customers.

In this context he has presented two types of investment analysis techniques i.e. fundamentals analysis to consider any securities such as equity, debenture or bond and other money and capital market instrument. He has suggested that the banks having international joint venture network can also offer admittance to global financial markets. He has pointed out the requirement of skilled labors, proper management's information system in joint venture banks and financial institution to get success in portfolio management and customer assurance.

According to Mr. Shrestha, the portfolio management activities of Nepalese commercial banks at present is in nascent stage. However, on the other hand most of the banks are not doing such activities so far because of following reasons. Such as unawareness of the client about the service available, hesitation of taking risk by the client to use such facilities, lack of proper techniques to run such activities in the best and successful manner, less development of capital market and availability of few financial investment in the financial market.

He has given the following conclusion for smooth running and operation of commercial banks and financial institution.

- ❖ For surviving commercial banks should depend upon their own financial health and various activities.

- ❖ In order to developed and expand the portfolio management activities successfully, the investment management methodology of portfolio manager should reflect high standards and give their clients the benefits of global strengths, local insights and product philosophy.
- ❖ With the discipline and systematic approved to the selection of appropriate countries, financial assets and management of various risk the portfolio manager could enhance the opportunity for each investor to earn supervisor returns over time.
- ❖ The Nepalese banks having greater network and access to national and international capital market have to go for portfolio management activities for the increment of their fee based income as well as to enrich the client base and contribute to the national economy

Some related journals to our study have been taken into account. Bill Ausura in his article entitled “*Current Issues in Technology Management*” shows portfolio management has become one of the one the hot topic in industry over the last three to five years. Portfolio management must be interwoven into multitudes of other business activities, processes and disciplines in order to really be effective. Some key items which must connect with and precede portfolio management include formulation of company mission, goals and strategy, and establishment of solid work and organizational structures. One final item to consider in context for portfolio management is the nature of corporate culture or understands fully, but it is often the one which presents the greatest implementation barrier when companies attempt to start doing portfolio management.

Portfolio management has been studied, documented and discussed for decades. Some companies have done an excellent job of establishing and maintaining core competencies in this key business function. But today more then ever, companies are challenged to learn and apply the full discipline of life cycle portfolio

management. As market and competitive pressures continue to increase especially in times of economic uncertainty the needs for good portfolio management becomes more pressing. However, these same market and competitive pressures often cause companies to miss the critical role of portfolio management as they cut corners in budgets and people, putting their emphasis and their hopes more and more on individual new projects instead of taking a more holistic to overall business management. (Ausura 2002)

Brennam and Cao (1997), An article entitled "*International Portfolio Investment Flows*" they develop the model of international equity portfolio investment flows based in difference in informational endowments between foreign and domestic investors. It is shown that when domestic investors possess a cumulative information advantages over foreign investors about their domestic market, investors tend to purchase foreign assets in period when the return on foreign assets is high and to sell when the return is low.

Followings are the conclusions from the article:

-) The article has developed a model of international equity portfolio flows that relies on informational differences between foreign and domestic investors.
-) The model predicts that if foreign and domestic investors are differentially informed then portfolio flows between two countries will be a linear function of the contemporaneous returns on all national market indices: and if domestic investors have a cumulative information advantage over foreign investors about domestic securities, the co-efficient of the host market return will be positive.
-) Portfolio flows are associated with returns on national market indices as the symmetric information hypothesis implies.

-) The examination of U.S. portfolio investment in emerging markets shows the strong evidence that U.S purchases are positively associated with local market returns in many countries.
-) This model is able to explain only a small proportion of the variance of international equity portfolio flows.

An article entitled “Expected return, realized return and assets pricing tests” by Edwin J. Elton explained on the fundamental issues in finance is 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. The data set covers the period from July 1, 1991 through December 31, 1997. The history shows almost all the testing are done taking realized return as a proxy for expected return. Using realized return as a proxy for expected return is that the unexpected returns are independent, so that as the observation interval increases they tend to a mean of zero.

Following preliminary tests are done in the study;

-) A constant risk premium
-) Forward rates and risk premium
-) Factor analysis
-) Changing risk premium

According to the researcher “Realized returns are a very poor measure of expected return and that information surprises highly influence a number of factors in assets pricing model”. The empirical use of judgment and factor dependability can be used to draw implication which will govern to the great extent the pricing decision fix and accurate

2.4 Review of Thesis

Bajracharya, Prabina (2000) conduct a study on "*Investment of Commercial Banks in Priority Sector*" with the objective of:

- To analyzed the trend of investments in private sectors for 10 years from 2047 B.S. to 2056 B.S.
- To analyzed the trend of repayment in private sectors of 10 years.
- To measure the effectiveness of the program in terms of the investment and repayment in rural and urban sector.
- To evaluate the banking procedures and services in disbursing loan in this sector.

Researcher used to various financial tools to analyze the data to support the conclusion. The major ratios like total investment to total deposit ratio, loan and advances to total deposit ratio, net profit to total asset ratio, investment on government securities to total outside investment ratio etc. Other financial tools like return on portfolio return on loan and advances, return on share and debenture, return on government securities are used to find relevance and significance of the samples. To process the financial data, some common statistical tools like co-variance, coefficient of variation, mean and trend analysis are used.

Major Finding:

- The target of 12% investment of total outstanding liabilities in priority sector and 3% out of which has been invested in deprived sector has been met by RBB.

- Trend analysis for 10 years shows the increasing trend of investment in priority sectors which shows that the CBs are giving due consideration to increase investment in priority sector.
- Interest charged on the loan disbursed in this sector is fairly less than the interest charge on loans for other purposes. In addition to this, there is high overhead cost incurred for supervision, administration and others in this program.
- Regression analysis shows positive relation between investment and repayment.
- The chi square test of effectiveness of program is more effective in rural semi rural area as compared to the urban areas.
- Investment on agriculture is higher than investment on industry and service sector.
- The study revealed that the procedure of loan disbursing itself is complicated for the borrowers to understand.
- In fact, if the supervisors make the scheduled supervision & inspection & the frequent contact with the borrowers the chance of misuse of the loan can be minimized.

Khaniya (Banjade), Kalpana, (2003), in her thesis entitled "*Investment Portfolio Analysis of Joint Venture Banks*" has been done in 2003. The study is based on five joint venture banks and they are; NABIL, SCBNL, HBL, NBBL & EBL. The general study of the present study is to identify the current situation of investment portfolio of joint venture banks in Nepal. The specific objectives are as follows:

- To analyze the risk and return ratios of commercial banks.

- To evaluate the financial performance of joint venture banks.
- To study exiting investment policies taken by NABIL in various sectors.
- To study portfolio structure NABIL bank Ltd. In investment as compared to other joint venture banks.
- Preference given by Nabil bank Ltd. For investment between loan investment, investment in real fixed assets, investment in financial assets.

Researcher used to various financial tools to analyze the data to support the conclusion. The major ratios like total investment to total deposit ratio, loan and advances to total deposit ratio, net profit to total asset ratio, investment on government securities to total outside investment ratio etc. Other financial tools like return on portfolio return on loan and advances, return on share and debenture, return n government securities are used to find the relevance and significance to the samples. To process the financial data, some common statistical tools like co-variance, coefficient of variation, mean and trend analysis are used.

Major Finding;

Based on the analysis of the various data remarkable finding are drawn up. The major findings are as follows;

- SCBNL and HBL have better position. NBBL and NABIL have a low position in the industry. But EBL has a very low position in the industry because of having lowest mean return on shareholder's fund resulting from the negative returns in the fiscal years 1995/96 and 1996/79.
- SCBNL has the highest mean return and EBL has the lowest return. Expect EBL, all other four banks i.e. NABIL, SCBNL, HBL and NBBL have good performance.

- Among other joint venture banks, SCBNL has the highest return and EBL has above mean return than industry average. SCBNL and EBL mobilized the funds in investment title is higher than the standard ratio.
- NABIL, SCBNL and HBL are investing low amount of deposits on loans and advance which is lower than industry average and NBBL and EBL have invested a high amount of deposits to loans and advances title which is higher than industry average.
- NABIL is investing the highest amount of funds on NRB bond as compared to other JVBs i.e. 3%. NBBL has invested no amount of funds in this title and EBL has invested the lowest of funds i.e. 0.4% and SCBNL and HBL have invested above industry average.
- SCBNL has the highest EPS and EBL has the lowest EPS. Similarly HBL also has above mean EPS than industry average and that of NBBL is lower than industry average.
- HBL has the lowest beta coefficient among the five JVBs which means that the systematic risk of HBL is the lowest among JVBs. The portfolio return of NBBL is 94%. This return is the average of capital gain yield and dividend yield.
- The coefficient of correlation between loans and advance in private sector and portfolio return if joint venture banks come out to be $r_{xy} = 0.6$. Therefore it indicates that there is negative correlation between loans and advances in private sector and portfolio return of five JVBs in Nepal.

Mahandhar, Manilata, (2003) in her thesis entitled "*Analysis of Risk and Return on Common Stock Investment of Commercial Bank in Nepal*" has been done in 2003. The main objective of the study is to analyze risk and return on common stock investment of CBs and other objectives are as follows;

- To examine risk and return on common stock of NABIL, BOKL, HBL, NBBL, NBIL.
- To calculate risk and return of their portfolio.
- To identify whether stocks of selected companies are over-priced, under-price and equilibrium priced.

Focusing on risk and return pattern of the sample taken from the listed companies, Researcher used financial tools to calculate the financial factors like MPS, DPS. The major financial tools like Holding period Return (HPR), Expected Rate or Return, Beta coefficient to measure systematic risk, portfolio risk along with other statistical majors. To draw the conclusion, researcher has used Hypothesis test to satisfy the null hypothesis.

Major Finding:

- Stocks have greater volatility risk than other investment, which takes a random and unpredictable path. Stock market is risky in the short term and it is necessary to prepare the investors for it.
- This study used the historical data of five years starting from FY 053/054 to 07\57/058 and found the FY 057/058 is best for banking sector according to market capitalization.
- Expected return of the common stock of BOKL is maximum (i.e. 1.1267) due to the effect of unrealistic annual return. Similarly, expected return of the common stock of NABIL is found minimum (i.e.0.4917). On the basis of sector-wise comparison, expected return on banking sector (i.e.67.39%) is higher and others sector is the least (i.e.0.65%).
- Risks associated with common stock investment of different selected companies are 1.3949, 0.4154, 0.7392, 0.6798 and 0.1429 of BOKL,

- NABIL, HBL, NBBL, and NIBL respectively. In the context of comparison of banking sector with other sector expected return is greater than that of other sectors. Standard deviation of other sector is greater than that of other sectors. CV of others sector is greater than that of others.
- BOKL, NABIL, HBL, NBBL's beta coefficient is 2.30, 2.01, 1.0853, 1.7632 and 1.7441 respectively, which is greater than one. Therefore such banks common stocks are more volatile with market. On the other hand NIBL's beta coefficient is 0.3461, which is less than one, therefore common stock of NIBL is said to be less volatile with market.
 - One of the main significance of beta coefficient is in capital asset pricing model (CAPM). CAPM is a model that describes the relationship between risk and return.
 - Stock of all banks in this study are said to be under priced. These companies' common stocks are worth to purchase, as their expected return is greater than required rate of return.
 - Portfolio return is greater than portfolio risk of two banks (i.e. NBBL and HBL)

Sabita Shah, (2004) in her thesis *"Impact of Interest Rate Structure on Investment Portfolio of Commercial Banks in Nepal"* has been done in 2004. The main objective of the study is to analyze the interest rates structure and its impact on various activities of commercial banks. Other objectives are as follows;

- To present the concrete picture of the interest rates structure before and after liberalization.
- To study the relationship between interest rates and other economic variables like deposit, loan, and advances, total investment and credit flow of commercial banks.

- To evaluate the trends of deposit, loan and advances, total investment and credit position of commercial banks.
- To analyze loans and advances in different sectors of investment portfolio of commercial banks.
- To study the current impact of deregulation on interest rate and its effects on related fields.

Measuring interest rate impact in terms of return in investments, researcher used financial tools to calculate interest returns in savings and fixed deposits as well as the impact on loan distribution patterns. Research gave the key to find out the significance difference of interest rate structure between deposits and loans. Taking the liberalization policy as a marginal impact researcher tried to conclude the research by assessing various ratios in terms of interest.

Major finding:

- The interest rates on saving deposit are less or more constant in five years of before liberalization but it started to decline after liberalization. In the same way the fixed deposit rates also started to decline after liberalization. Thus the deposit is increasing at decreasing rate. The lower rates of interest rates decrease deposit. Deposit rate is the most important determinant of the deposit collection.
- The lending rates on purpose wise loan i.e. industrial sector, agricultural sector increased in average after liberalization but decreased in commercial sector. Increasing in lending rates resulted in the decrease in credit flow, which consequently decreased the profit of commercial banks.
- The amount of deposit increased after liberalization but the growth rate in average comparison to before liberalization increased only by 0.44%. Thus

the deposit had not increased more even after the existence of liberalization is due to the declining deposit rates.

- Credit/Loan and advances also influenced by the lending rates. Increment in lending rates decreases the growth percent of credit flow. In this analysis except agriculture and general use and purpose sector the other sector growth rate is found to be increasing after liberalization instead of increasing lending rates. So it can be said that this increasing is not only due to changing lending rates but also other factors, i.e., income, inflation, competition which indirectly affects credit flow of CBs.
- CBs investment in government and other securities highly increased in the year liberalization, which is due to the lack of proper utilization of collected resources. But started to decline after two years of liberalization and reached to negative point due to the higher rate and enough promising investment opportunities available in private sectors.
- The correlation between interest rates and amount of saving deposit is found to be less correlated before liberalization. But in case of fixed deposit interest rates and amount are found to be negative correlation before liberalization. Higher the deposit higher will be the credit flow and higher will be the profit in which the correlation between deposit and credit is positive before liberalization but there is high degree of correlation between deposit and credit after liberalization. Correlation between deposit and investment is highly positive correlated before liberalization but it is found to be negative correlation after liberalization. Lending rates after liberalization in commercial sectors is found to be decreasing.
- There is no significant relation between saving deposit and interest rates before and after liberalization but no significant relationship between fixed deposit and interest rates. Purpose wise loan and lending rates before and

after liberalization is significant relationship. There is significant relationship between commercial and industrial sector loan before and after liberalization but no relation between agriculture, general use and purpose and service sector loan before and after liberalization.

Natasha Shrestha, (2005) in her entitled "*Portfolio Analysis of Common Stock of Commercial Banks in Nepal*" has been done in 2005. The main objective of the study is to find out level of portfolio risk and return on stock of commercial bank investment and other objective are;

- To analyze the trend of NEPSE index.
- To analyze the risk and return of common stock of reviewed banks.
- To analyze the market price movement of the common stock.
- To try to find out the best portfolio from NEPSE.

Various tools are used to analyze the data to support the conclusion. Trend analysis showed the trends of NEPSE Index. Risk and return tools like Beta coefficient, portfolio risk and return, Expected return, holding period return along with statically tools like CV, Standard Deviation, Correlation and Regression are used to find out the relevance of data collected.

Major finding;

- Expected return of HBL stock is highest i.e. 53.68% and NABIL is lowest i.e. 32.72% among the banks. NBBL and SCBL have expected return of 47.05% and 39.02% respectively. The risks of NBBL is highest i.e. 93% and SCBL has a lowest risk i.e. 55.42% HBL and NABIL have a risk of 84.98% and 60.86% respectively.
- The correlation of stock, return and market shows that all of the banks stock are highly positive correlated with the market. The correlation values of

common stock of all bank with the markets is nearly equal +1. Stock of NBBL is highest positive correlation which has values of +0.981 and HBL is lowest positive correlated which has a value of +0.82.

- All of banks beta of common stock is greater than 1. Beta greater than 1 implies that stocks are more volatile than market or said to be aggressive stock. NBBL has the highest beta i.e. 2.1785 and SCBL has the lowest beta i.e. 1.2142. All of the stocks are aggressive.
- NBBL has highest portfolio return i.e. 7.98% and highest portfolio risk i.e. 21.70%. NBBL has invested its more funds on risky assets and fewer funds on risk free assets. So there exist highest risks as well as return. The principle "higher the risk higher the return" is applied for it. Likewise, HBL has the lowest portfolio return i.e 5.33% and portfolio risk 0.35%. It has invested more of its fund in on risk free assets and least fund in risky market. The principle "no risk no gain" is applied for it.
- The performance measure shows the ranking stock by different method. The Sharpe's performance shows that performance of stock of SCBL is 1st and HBL is 4th. The Treynor's performance once measures shows that performance of stock of NBBL is 1st and HBL is 4th. Likewise Jenson's performance measure shows the performance of stock of SCBL is 1st NBBL is 4th among the banks.
- Among four banks optimal portfolio return and risk shows that return NBBL is highest i.e. 32.7% and return of HBL is lowest i.e. 24.9% and HBL has a highest portfolio risk of i.e. 61% and SCBL has a lowest portfolio risk of 34.8%.

Khem Raj Shrestha, (2006) in his thesis entitled "*A Study on Investment Portfolio of Commercial Banks in Nepal*" has been done in 2006. The general

objective of this research is to identify the current situation in investment portfolio of CBs in Nepal. The main objectives are as follows:

- To analyze the investment portfolio of Commercial Banks
- To analyze the risk the return of selected commercial banks on investment using Portfolio concept.
- To forecasting and examine the trend of investment and to provide complementary measured based on analysis.

Methodology used to analyze the data included common financial tools like return on share and debenture, return on government securities, return on loan and advances and return on portfolio. For risk measurement, it was measured on risk on individual assets and risk on portfolio. The major ratios like return on total asset ratio, total investment to total deposit ratio, loan and advances to total deposit ratio, government securities to total deposit ratio are used. To verify the assumption, there used common statistical tools like standard deviation, arithmetic mean, co-variance, correlation and regression analysis.

Major finding;

- Proper investment on various securities i.e. balance allocation of funds on various government securities such as Treasury bills, National saving bonds, Development bonds etc and fixed income percentage rate that help to reduce the variability of return. In the analysis of and risk and return comparatively SCBNL have more return from investment on government securities like same NABIL has better position on investment on loan and advances.
- The return on share and debenture of commercial banks shows wide fluctuation. These fluctuations in returns are caused mainly by the volatility of the shares prices in market and by the changes in dividends in some extent. Comparatively to other assets, share and debenture has higher return

and higher risk. Hence, it is cleared from analysis that investment on share and debenture is high risky assets.

- The return is slightly lower than average return from loan and advances and shares and debentures. The portfolio risk on investment is less than that of risk on loan and advances and risk on share and debenture. It shows there is vital role of government securities to reduce the risk.
- The study shows that the portfolio return is decreasing trend every year. It shows the investment portfolio concept is not using properly by the selected banks.
- SCBNL is the bank that mobilized its total deposits more effectively on government securities. EBL has concentrated to mobilize its depositor's funds in loan and advances. HBL, NSBIBL and NIBL are not so successful to mobilize its depositor's funds in government securities. But NSBIBL is also more successful to mobilize depositor's funds in loan and advances as well as share and debentures. And NIBL effectively mobilize its depositor's funds in share and debentures.

Bhavishor Paudyal, (2006) conduct a study on "*A study on Portfolio Analysis of Commercial Banks in Nepal*" with the objective of

- To evaluate financial performance of commercial banks of Nepal.
- To examine the existing situation of portfolio management of Nepalese commercial bank.
- To analyze risk and return of commercial banks.
- To analyze the investment and loans and advance portfolio of commercial banks.

- To show the present position trend of loans and advance and investment to total deposit and forecast it.

Using common financial tools like ratios, portfolio return, portfolio risk, systematic and unsystematic risks, and researcher tried to give up the insights of financial performance. To process the financial data, some common statistics tools like correlation, covariance, and coefficient of determinant are used to find the relevance and significance of the samples.

Major findings:

- The industrial mean ratio of investment to total deposit is 21.86%. The only EBL has a greater ratio above industrial mean ratio i.e. $24.77 > 21.8$. But other banks have lower investment to total deposit ratio than industrial mean ratio. It shows that EBL has effective mobilization of its deposit on investment to generate the return. But other banks are investing their deposits in lower ratio than average industry ratio. Similarly, the CV of EBL is the lowest i.e. 19.9%. Lower ratio indicates that cost consistent which is better than high consistent. The industry CV ratio is 32.37%. The EBL and HBL have the lesser CV ratio to the comparison with industrial CV ratio. It shows variability of ratio of EBL and HBL is the most consistent.
- Among four commercial banks HBL has invested its more funds on government securities (i.e. risk free assets) and lesser fund on share and debenture (i.e. risky assets). All banks have invested more than 83% amount in government securities. Only BOKL has invested its 0.63% on non-resident sector. None of the banks have invested any amount on NRB bond.
- All of the selected commercial banks are granting very high amount of its loan and advances to private sector. NIBL and HBL have given second priority

to government enterprise and EBL and BOKL give second priority to foreign bills purchase and discount. EBL and BOKL have granted very low (less than 1%) loan and advance to government enterprises.

- BOKL stock has the highest expected return i.e. 8.34% and HBL has the lowest expected return i.e. -8.82%. NIBL has also negative return i.e. -7.71%. The market expected return is -6.47%. The risk of BOKL is the highest i.e. 57.14% and HBL has the lower risk i.e. 15.26%. NIBL and HBL have risk 19.41% and 36.03% respectively. The market risk is 15.68%. In conclusion we can say that higher the risk higher the return and vice versa.
- Total risk of BOKL stock is highest and total risk of HBL stock is lowest among four commercial banks.
- HBL has the highest portfolio return i.e. 4.85%, NIBL stock has lowest (i.e. negative - 1.19%) portfolio return and it has the highest portfolio risk i.e. 8.46%. It means NIBL invest its amount in risky assets so it become in loss. EBL and BOKL have a portfolio return of 4.79% and 4.80% respectively and portfolio risk is 0.28% and 5.77% respectively. It shows that the portfolio return of three banks is not so different but risk of BOKL is higher than HBL and EBL.
- EBL is utilizing its more collected fund on loan and advances and investment which mean percentage ratio is 95.85%. It is the highest average ratio among four commercial banks. HBL is in lost position on its 67.36%. Other banks NIBL and BOKL are utilizing their deposit in loan and investment is 83.59% and 94.73% respectively.

2.5 Research Gap

In Nepal, there have been no up-to-date studies carrying out regarding portfolio management of investment in the securities issued by listed commercial banks. Independent studies regarding the analysis of stocks have not yet been found. It is found that only master's degree students have been carrying out thesis works in such topics. Nevertheless, these studies are concentrated on portfolio analysis of commercial banks. No study has been carried out regarding securities portfolio consisting of the stocks of listed commercial banks. Most of the studies are concentrated on the risk and return analysis of stocks of listed companies. Keeping in view the above facts and situation, different sets of portfolios between the stocks of listed commercial banks have been created using different weights. Optimum portfolio of three assets has also been chosen based on the maximum return and minimum risk from the created sets of portfolios. Hence, this study has attempted to introduce new model for creating the best portfolio and assigning weights between the stocks of commercial banks available in Nepalese stock market.

CHAPTER – III

RESEARCH METHODOLOGY

Research is the way of finding solution systematically. A research is an in-depth study and advancement of existing knowledge about subject matter. It is a method of serious thinking by defining problems, formulating hypothesis or suggested solution, collecting organizing, evaluating, manipulating data and making conclusion to determine whether they fit the formulation of hypothesis. Thus, the term “Research refers to a critical careful and exhaustive investigation, inquiry, examination, or experimentation having as its aim the revision of accepted conclusion, in the light of newly discovered facts. Research methodology is the style, framework or way of defining the solution for specific research problem systematically. Research methodology defines the reasons behind the uses of specific tool and technique in research. Research methodology is a part of proactive management that reduces cost, time, and unnecessary burden of analysis.

3.1 Research Design

Proper planning is essential to get success either in battlefield or in research. Research design is a strategic approach to be proactively maintained probable cause and effects. A researcher also develops a framework or design of strategy to get solution of research problem. Research design is a brief structure design of strategic investment conceived to get research objectives. This research is acquainted to examine and find out the problem and possibility of generating the portfolio investment for the public with special reference to financial securities listed in NEPSE. Nature of this research is historical, descriptive and analytical research because this research based on historic data, generalized theorem of financial management and investment analysis evaluation the data of reference companies.

3.2 Population and Samples of Data

The term population of data denotes for the data of securities listed in NEPSE and Sample data are the data from organizations selected from population in few numbers. First, research has considered only common stock as sample and second, those securities which were listed NEPSE in FY 1996/97, are selected. Third, random selection model on the personal judgment of researcher is used to select sample organizations for the study. The population data of this study are data from all companies listed in NEPSE and sample data among them.

Many companies are already listed in NEPSE and this is on-going process. From the population of 23 commercial banks, the samples taken from the study are BOK, NABIL, HBL and NIBL.

3.3 Nature and Sources of Data

Data are the mathematical expression of variables. Data help to develop some understanding in quantitative phenomenon. The data collected from field survey from the questioner is primary data so that researcher made some question and given to the different people to fill up and from that result researcher made an analysis. The data collected from others and made available as published or unpublished statistics are secondary data. Those data helped during this research period. Sources of secondary data are published and unpublished data from organization like shareholder report, annual report, reviews and reports, report and reviews from SEBO, trading reports of NEPSE, statistics report and annual report of NRB, articles from various magazines, previous thesis and dissertation, homepages, books and journals.

3.4 Data Collection Techniques

Data were not available in readymade format. Data manipulated as per research requirements. First, needed data assessed. Second, data are collected and only

essential are selected, classified and such a way that they represent qualitative and quantitative glimpse. Only manipulated data used in this research. To manipulate data Computer Application program MS- Office, Professional Edition, 2002 were used. Techniques of data collection are as follows:

-) Library Research
-) Internet, Homepages and Related Links study
-) Review and reports of concerns

3.5 Data Analysis Tools

Data do not represent result expect use of analytical tools. In this research various analysis tools from the field of economics, Statistics, Mathematics and other required tools. During this research, following tools borrowed from various fields:

3.5.1 Financial Tools

Holding Period Return

Holding Single period return is the return provided by the investment in a period is holding return. HPR consist capital gain as well as dividend gain.

Symbolically,

$$\text{HPR} = \frac{\text{Ending Price} - \text{Beginning Price} + \text{Dividend Received}}{\text{Beginning Price}}$$

where,

-) HPR denotes for holding period return for the period
-) Ending price denotes for the periodic ending price of the security.
-) Beginning price denoted for the periodic beginning price of the security.
-) Dividend received denotes for the dividend received for the period.

Amount of dividend received obtained by Cash dividend plus stock dividend.

i.e. Dividend = Cash dividend + Stock dividend

Where, stock dividend based on the product of stock dividend ratio and next year market price per share (MPS).

i.e. Stock Dividend = Stock dividend ratio | Next year MPS.

Required Rate of Return

The required rate or return is the minimum rate of return that an investor expects. It is a function of real rate of return and risk. The required rate of return is a risk premium over the risk-free return. It is determined by CAPM.

Symbolically,

$$\text{Required rate of return } (R_j) = R_f + (R_m - R_f) \beta_j$$

Where,

) R_j denotes for required rate of return

) R_f denotes for risk-free rate of return

) R_m denotes for market rate of return

) β_j denotes for beta of the security.

Expected Rate of Return

A hypothetical rate of return expected by the investment based on future calculation is the expected rate of return. It is assumed that history repeats itself. The future cash flow is based on the historical cash flow. The expected return will be the average of historical rates of return. In terms of holding period return, the expected rate of return for any specific securities is the expected rate of return taken from its historical return.

Symbolically,

$$E[R_j] = \frac{\sum_{t=1}^n HPR_j}{n}$$

Where,

-) $E(R_j)$ denotes expected rate of return of security j.
-) t denotes for investment horizon.
-) HPR_j denotes for annual holding period return of security j.
-) N denotes for number of investment horizons.

Risk on Common Stock

Risk is product of uncertainty in the return of the stock. Risk measured in term of standard deviation and Variance.

Symbolically,

$$\text{Standard Deviation of Security } j = \sqrt{\frac{\sum (R_j - E(R_j))^2}{n-1}}$$

$$\text{Variance } (\text{Var}_j) = (\sigma_j)^2$$

Where,

-) Var_j denoted for the variance in the return of Common Stock
-) R_j denotes for rate of return of security j.
-) $E(R_j)$ denotes for rate of return.
-) R_f denotes for risk free rate of return.
-) R_m denotes for market rate of return.

The most common measure of risk in finance is Variance Standard Deviation and Variance are equally used equivalent quantitative measure of risk.

Market Return

Return of the market is the Average return of the all investment opportunity available in the market.

$$\text{Annual Market Return (R}_m) = \frac{\text{NEPSE Index at end of the Year} - \text{NEPSE Index at beginning of the year}}{\text{NEPSE Index at Beginning of the Year}}$$

Market return is the average taken from the annual Market return. Mathematically summation of annual market return divided no of period. Since the market return based on the NEPSE index, assumption and limitation taken by NEPSE are key for hidden factors.

Symbolically,

$$\text{Market Return } \bar{R}_m = \frac{\sum R_m}{n}$$

Where,

-) R_m denotes for market rate of return
-) n denotes for no market return

Market Risk

Market Risk is the risk as a whole for market measured in term of standard deviation and variance. Variance is the square root of standard deviation.

Symbolically,

$$\text{Standard Deviation } \sigma_m = \sqrt{\frac{\sum (R_m - \bar{R}_m)^2}{n-1}}$$

$$\text{Variance (Var}_m) = (\sigma_m)^2$$

Where,

-) R_m denotes for market rate of return
-) N denotes for no of market return

Portfolio Return

Portfolio return is the return obtained by portfolio. Portfolio return is the weighted average of the expected return of individual securities, weight are the proportion of investment made in individual securities by total wealth.

Symbolically,

$$\text{Portfolio Return } (R_p) = W_1 E(R_1) + W_2 E(R_2) + \dots + W_n E(R_n)$$

$$\text{OR, Portfolio Return } (R_p) = \sum_{j=1}^n W_j E(R_j)$$

Where,

-) R_p denotes for portfolio return.
-) n denotes for no of security held in portfolio.
-) $E(R_j)$ denotes for expected rate of return of stock j .
-) W_j denotes for the portfolio weight for the stock j .

For two assets portfolio return

$$\text{Portfolio Return } (R_p) = W_1 E(R_1) + W_2 E(R_2)$$

Portfolio Risk

In totally, what is the risk of wealth is the risk of portfolio risk is the function of individual standard deviation of security of security, respective weight and correlation between securities. The portfolio risk for the two assets portfolio will be as follows:

$$\sigma_p = \sqrt{W_1^2 \sigma_1^2 + W_2^2 \sigma_2^2 + 2W_1 W_2 r_{12} \sigma_1 \sigma_2}$$

The variance used to measure the risk of the portfolio. It is the square root of the standard deviation.

$$\text{Var} = (\sigma_p)^2$$

Where,

- σ_j denotes for stocks standard deviation.
- σ_p denotes for portfolio standard deviation.
- n denotes for no of security held in portfolio.
- W_j denotes for the portfolio weight for the stock j.

Risk Premium

Risk Premium, deviation or additional return higher than risk free rate, is the reward for the investors bearing more risk. The difference of market return and risk free return is the risk premium.

Symbolically,

$$\text{Risk Premium} = [E(R_m) - R_f] \beta_j$$

Where,

- E(R_m) denotes for Return of market.
- R_f denotes for Risk Free rate of Return.
- β_j denotes for Beta of stock j.

Beta Coefficient

Beta Coefficient tells how much systematic risk has containing by security. The tendency of a stock to move up and down with the market reflected in its beta coefficient, β. Therefore, beta is a key element of the CAMP; mathematically the beta coefficient of a stock is the stock's covariance with the market divided by variance of the market portfolio.

Where,

- Cov_{j & m} Denotes for covariance between the return on investment and the return of the market portfolio

) σ_m^2 Variance of the market portfolio.

Individual stock can classify as aggressive or defensive of average based on beta coefficient.

1. If beta coefficient is less than one, the stock is defensive stock which is less risky in comparison to market risk.
2. If beta coefficient is exactly one, the stock is average stock which is equally risky to market risk.
3. If beta coefficient is greater than one, the stock is aggressive stock which is less risky in comparison to market risk.

Systematic Risk

Systematic risk is portion of variability in return caused by market failure that simultaneously affects the prices of all securities. Systematic risk is unavoidable.

Symbolically,

$$\text{Systematic Risk} = B_{jm}^2 \text{Var}(R_m)$$

Where,

) B_{jm} denotes for Beta Coefficient of stock j with market return.

) $\text{Var}(R_m)$ denotes for Variances of market return.

The percentage of systematic risk is measured by the coefficient of determination. Those will shows how much risk has been increased when per unit change in systematic risk.

$$\text{Proportion of Systematic Risk} = \frac{\text{Systematic Risk}}{\text{Total Risk}}$$

$$OR, \text{ Proportion of Systematic Risk} = \frac{B_{jm}^2 \text{Var}(R_m)}{\text{Var}(R_m)}$$

$$OR, \text{ Proportion of Systematic Risk} = \frac{B_{jm}^2}{2}$$

$$OR, \text{ Proportion of Systematic Risk} = \rho_{j \& m}^2$$

Unsystematic Risk

Unsystematic risk portion of risk is caused by internal deficiencies of organization. It is unexplained by the market movement. It occurs due to problems in industry or company only.

Symbolically,

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

$$\text{Proportion of Unsystematic Risk} = \frac{\text{Total Risk} - \text{Systematic Risk}}{\text{Total Risk}}$$

$$OR, \text{ Proportion of Unsystematic Risk} = 1 - \frac{B_{jm}^2 \text{Var}(R_m)}{\text{Var}(R_m)}$$

$$OR, \text{ Proportion of Unsystematic Risk} = 1 - \frac{B_{jm}^2}{\uparrow^2}$$

$$OR, \text{ Proportion of Unsystematic Risk} = \uparrow^2 j Z^{B_{jm}^2 \uparrow^2}$$

Sharpe's Portfolio Performance Measure

Sharpe's index of performance generates one ordinal number that determined by both the risk and the portfolio. It ranks the portfolio return premium over risk free rate on the base of portfolio risk.

Symbolically,

$$S_p = \frac{R_p - R_f}{\sigma_p}$$

Where,

-) S_p denotes for Sharpe's Portfolio Performance Measures.
-) R_p denotes for Return of Portfolio.
-) R_f denotes for Risk Free rate of Return.
-) σ_p denotes for portfolio risk.

$R_p - R_f$ is the Risk premium for portfolio. The risk premium is the additional return over the above risk less rate that paid to induce investors to assume risk.

3.5.2 Statistical Tools Standard Deviation and Variance

Standard deviation is a statistical measure. It is widely used to measure risk from expected rate of returns. The standard deviation represents dispersion of return. Standard deviation is the square root of deviation taken from actual mean of the distribution in simple and Variance is square of standard Deviation.

Symbolically,

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

$Var X = (\sigma)^2$

Where,

-) σ_j denotes for Standard Deviation of security j.
-) R_j denotes for Annual return of Stock j.
-) $E(R_j)$ denotes for Expected return of Stock.
-) N denotes for sample size j.

Coefficient of Variation

We know that standard deviation is the absolute measure of dispersion of rate of return. The relative measure of dispersion based on the standard deviation is known as the coefficient of standard deviation.

Symbolically,

$$\text{Coefficient of Variation (CV)} = \frac{\text{Standard Deviation}}{\text{Mean}} \times \frac{\uparrow}{X}$$

Two distributions better compared by CV. Less the Coefficient of variation more will be the uniformity, consistency in distribution and High the Coefficient less the uniformity or consistency in distribution of return.

Covariance

The covariance measures how two variables co-vary. It is a measure of the absolute association between two variables. How the returns of individual stocks and market co-vary measured by covariance between the return of individual stocks and market return. If two variables are independent, their covariance will be zero. It is computed as:

Symbolically,

$$\text{Cov}(j \& m) = \sum P_{j \& m} X_j \uparrow X_m \uparrow$$

Correlation Coefficient

Correlation coefficient is a measure of the relative association between two variables; it describes how much linear co-movement exists between two variables. Correlation between stock j and the market is computed as:

Symbolically,

$$r_{j\&m} = \frac{xy}{\sqrt{x^2 \times Y^2}}$$

Where,

$$X_j = X(X_j - \bar{X}_j) \text{ and } Y_m = X(y_m - \bar{Y}_m)$$

Decision Parameter

-) If Correlation j & m is positive, the return on security j and market tend to be large at the same time and small at the same time.
-) If Correlation j & m is negative, relative large return of security j and associated with relative small return of market.
-) If Correlation j & m is zero, the return on security j uncorrelated to the return on market. Movement in the return of security j appear unrelated to movement in the return of market.

CHAPTER – IV

PRESENTATION AND ANALYSIS OF DATA

This chapter deals with the presentation and analysis of the returns and risks of common stocks of four commercial banks named BOK, HBL, NABIL and NIBL. Basically, this chapter is divided into two parts: analysis of secondary data, and interpretation on major findings of the study. Risk-return characteristics of common stocks of the above mentioned commercial banks have been analyzed and interpreted on the basis of secondary data. Return and risk characteristics of the two assets and three assets portfolio have been formed from and have also been analyzed on behalf of the individual investors. Side by side, situation of the price of the common stocks of each bank has been calculated to indicate whether they are overpriced or under priced. In addition, the unsystematic and systematic risk of each commercial bank has also been calculated, and individual stock's sensitivity with the market has also been calculated. Tables, diagrams and charts have been used to reveal the information precisely as demanded by the analysis.

4.1 Risk and Return of Common Stocks

The return on common stock is the percentage increase/decrease in share price and any cash receipts such as dividends (cash and valuation of stock dividend) over a specific period of time. Here, one year holding period return (R_j) has been calculated as stated below.

$$\text{HPR } (R_j) = \frac{(\text{EP} - \text{BP}) \Gamma \text{ Cash Dividends } \Gamma \text{ Value of Stock Dividend}}{\text{BP}} \times 100\%$$

Where,

EP = Ending Price or Closing Price of this Year

BP = Beginning Price or Closing Price of Previous Year

Again, the mean or average returns of the commercial banks have been calculated using the following formula of simple average as:

$$\bar{R}_j = \frac{R_j}{N}$$

The risk is the possibility that the actual return from holding a stock may deviate from the expected rate of return. It is measured by variance or standard deviation of returns. Standard deviation has been calculated as:

$$\text{Standard Deviation } (\Xi_j) = \sqrt{\frac{(R_j - \bar{R}_j)^2}{n}}$$

$$\text{Variance} = (\Xi_j)^2$$

Similarly, coefficient of variation of returns, C.V. (R_j) = $\frac{\Xi_j}{\bar{R}_j} \times 100\%$

Commercial Banks

Average rate of returns, variance of returns, standard deviations and coefficient of variation are presented Table 4.1

Table 4.1
Calculation of Mean, Standard Deviation and Variance of Returns of the BOK

Year	Closing Price (Rs.)	DPS (Rs.)	Stock Div.	Value of Stock Dividend (Rs.)	HPR (R _j) (%)	R _j - E(R _j)	{R _j - E(R _j)} ²
2001/02	254						
2002/03	198	10	0	0	-18.11	-86.9	7551.6
2003/04	295	10	0	0	54.04	-14.75	217.56
2004/05	430	10	0	0	49.15	-19.64	385.73
2005/06	850	10	30%	412.5	195.93	127.14	16165
2006/07	1375	10	0	0	62.94	-5.85	34.223
Total					343.95		24354
					68.79		4870.7

Mean = 68.79

Variance = 4870.7

Standard Deviation = 69.34%

Table 4.2
Calculation of Mean, Standard Deviation and Variance of Returns of the
HBL

Year	Closing Price (Rs.)	DPS (Rs.)	Stock Div.	Value of Stock Dividend (Rs.)	HPR (R _j) (%)	R _j - E(R _j)	{R _j - E(R _j)} ²
2001/02	1000						
2002/03	836	1.32	23.68%	198.91	3.62	-35.29	1245.4
2003/04	840	0	20%	184	22.48	-16.43	269.94
2004/05	920	11.58	20%	220	37.09	-1.82	3.3124
2005/06	1100	30	5%	87	32.28	-6.63	43.957
2006/07	1740	15	25%	435	99.09	60.18	3621.6
Total					194.56		5184.2
					38.91		1036.8

Mean = 38.91

Variance = 1036.8

Standard Deviation = 32.20%

Table 4.3
Calculation of Mean, Standard Deviation and Variance of Returns of the
NABIL

Year	Closing Price (Rs.)	DPS (Rs.)	Stock Div.	Value of Stock Dividend (Rs.)	HPR (R _j) (%)	R _j - E(R _j)	{R _j - E(R _j)} ²
2001/02	700						
2002/03	740	50	0	0	12.86	-64.91	4213.3
2003/04	1000	65	0	0	43.92	-33.85	1145.8
2004/05	1505	70	0	0	57.50	-20.27	410.87
2005/06	2240	85	0	0	54.48	-23.29	542.42
2006/07	5050	100	40%	2020	220.09	142.32	20255
Total					388.85		26567
					77.77		5313.5

Mean = 77.77

Variance = 5313.5

Standard Deviation = 72.89%

Table 4.4
Calculation of Mean, Standard Deviation and Variance of Returns of the
NIBL

Year	Closing Price (Rs.)	DPS (Rs.)	Stock Div.	Value of Stock Dividend (Rs.)	HPR (R _j) (%)	R _j - E(R _j)	{R _j - E(R _j)} ²
2001/02	760						
2002/03	795	20	0	0	7.24	-25.77	664.09
2003/04	940	15	0	0	20.13	-12.88	165.89
2004/05	800	12.50	0	0	-13.56	-46.57	2168.8
2005/06	1260	35.46	20%	345.8	105.18	72.17	5208.5
2006/07	1729	25	5%	86.45	46.07	13.06	170.56
Total					165.06		8377.8
					33.01		1675.6

Mean = 33.01

Variance = 1675.6

Standard Deviation = 40.93%

Table 4.5
Average Rates of Return, Variance, SD and CV of Commercial Banks

Commercial Banks	\bar{R}_j	Var (R _i)	† _r	CV (%)
BOK	68.79%	4870.7	69.34%	100.80
HBL	38.91%	1036.8	32.20%	84.51
NABIL	77.77%	5313.5	72.89%	93.73
NIBL	33.01%	1675.6	40.93%	123.99

The above table depicts that the average or mean return of the BOK was 68.79% over the five years period starting from mid July 2003 to mid July 2007 with variance of returns of 4870.7 and standard deviation of 69.34%. The coefficient of variation obtained by dividing the standard deviation of returns by the mean returns was obtained as 100.80% for the bank.

Similarly, the mean return for the HBL was obtained as 38.91% with variance of 1036.8 and standard deviation of returns of 32.20%. The coefficient of variation for the bank was calculated to be 84.51%.

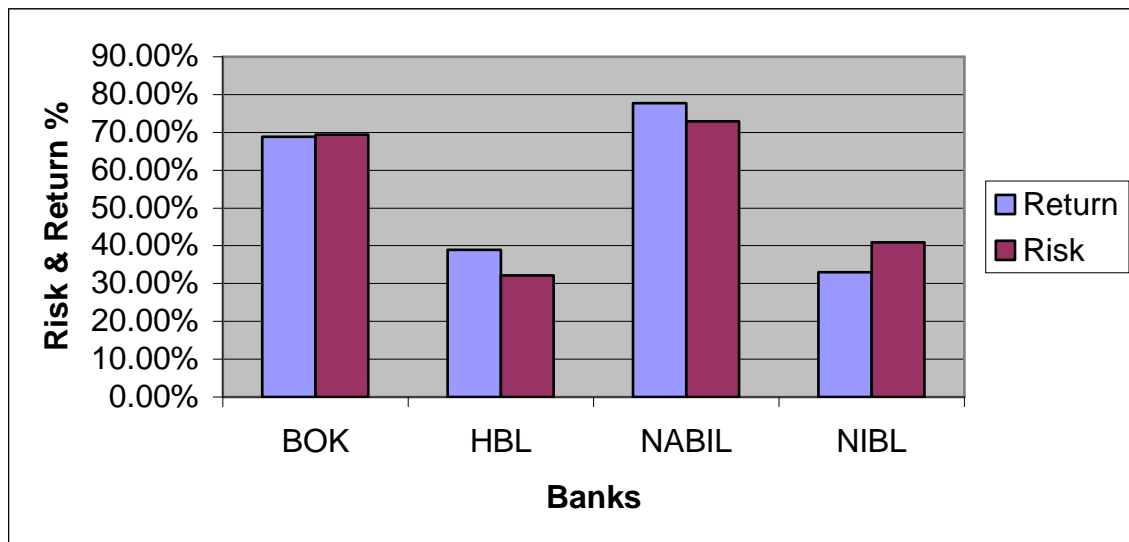
Likewise, the average or mean return of NABIL was found to be 77.77% for the past five years with variance of returns of 5313.5 and standard deviation of returns of 72.89%. The coefficient of variation for the bank was thus obtained as 93.73%.

And the average return of NIBL for the past five years was calculated as 33.01% with variance of 1675.6 and standard deviation of 40.93%. Likewise, the coefficient of variation of returns for the bank was calculated as 123.99%.

On the basis of table depicted above, NABIL had the highest expected return. However, the coefficient of variation for the HBL was the highest and NABIL was the lowest variation of returns.

Figure 4.1

Average Rates of Return, Variance, SD and CV of Commercial Banks



NABIL bank had the highest and HBL had the lowest variance of returns over the period. Similarly, NABIL also had the highest standard deviation of returns and HBL had the lowest standard deviation of returns. It seems that investors investing in shares of NABIL got highest rate of return and the lowest risk.

4.2 Market Sensitivity of Stocks

Covariance measures how the returns on common stock of individual companies and market co-vary. It measures the absolute association between two variables. Likewise, the correlation coefficient measures the relative association between two variables. The correlation between two variables always lies within the limit of -1 to +1.

The return on the market has been calculated by using the closing NEPSE index. The variability of security's return with the return of the overall market, return is called systematic risk and cannot be avoided. It is un-avoided risk and is measured by beta coefficient. Beta depicts the sensitivity of the security's excess returns to that of the market portfolio.

Commercial Banks

The calculated covariance, correlation and beta coefficients of the stocks of commercial banks are presented in Table 4.2.

$$\text{Beta coefficient, } \beta_m = \frac{\text{Cov}(R_j, R_m)}{\text{Var}(R_m)}$$

$$\text{Cov}(R_j, R_m) = \frac{\sum R_j - \bar{R}_j * \sum R_m - \bar{R}_m *}{N}$$

$$\text{Var}(R_m) = \frac{\sum R_m - \bar{R}_m^2}{N}$$

$$\text{Standard deviation, } \Xi_m = \sqrt{\frac{(R_m - \bar{R}_m)^2}{N}}$$

Table 4.6
Covariance and Beta Coefficients of Commercial Banks

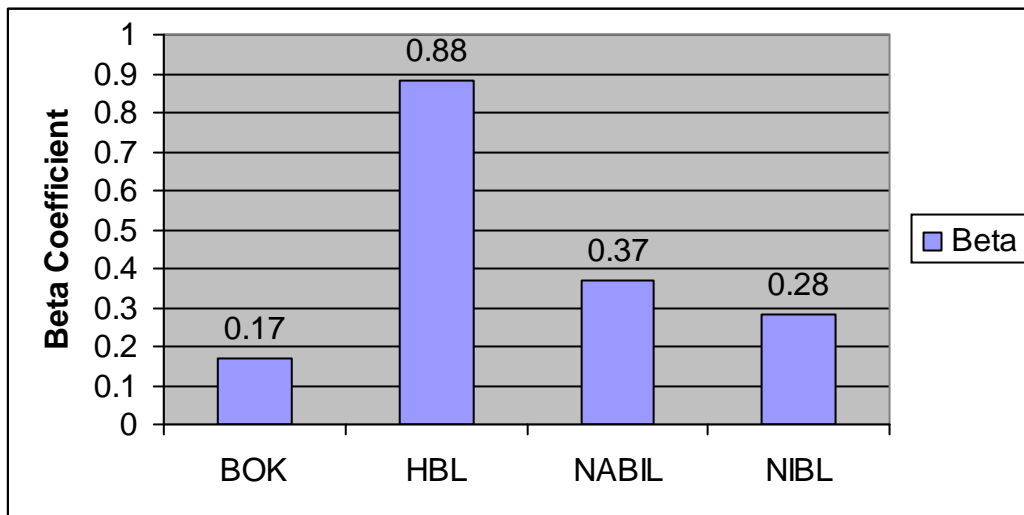
Commercial Banks	Cov (R_j, R_m)	S_{im}	Remarks
BOK	832.77	0.17	Defensive stock
HBL	910.30	0.88	Defensive stock
NABIL	1978.19	0.37	Defensive stock
NIBL	463.54	0.28	Defensive stock

Sources: Appendix 4

The Table 4.6 depicted above reveals the covariance of returns on stocks of respective banks with the return on market, and the respective beta coefficients. On due course, the beta coefficient of BOK was found to be 0.17, which indicates that the stock of BOK is less volatile as compared to the change in market circumstances and hence is an defensive stock. Similarly, the stock of HBL is considered as a defensive stock as given by the beta coefficient of less than one, i.e., 0.88 as it has the highest beta coefficient. Likewise, the beta coefficient of NABIL is found to be 0.37 and therefore is considered as the most defensive asset or less risky stock. And the stock of NIBL is also considered as a less risky stock or defensive stock as it has a beta coefficient of less than one, i.e., 0.28. As per the respective beta coefficients of the sampled banks, the stocks of HBL were found as the most risky one and the stocks of BOK were found as the least risky (least volatile) one as compared to other banks.

Figure 4.2

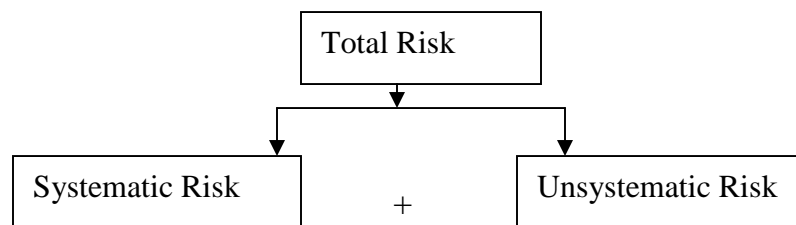
Beta Coefficients of Commercial Banks



4.3 Systematic and Unsystematic Risk

Total risk is measured by the variance of returns and can be partitioned into systematic and unsystematic risk. Systematic risk is also known as unavoidable or un-diversifiable risk. It is caused by market factors. Changes in the economic, political and sociological environment that affect securities markets are sources of systematic risk.

Partition of Total Risk



The systematic risk is computed as:

$$\text{Systematic Variance} = s^2 \text{Var} (R_m)$$

The percentage of systematic risk, also called proportion is measured by coefficient of determination. Proportion of systematic risk is calculated by:

$$\text{Proportion of Systematic Risk} = \frac{\text{Systematic risk}}{\text{Total risk}} = \frac{\beta^2 \text{Var}(R_m)}{\text{Var}(R_i)} = \beta_{im}^2$$

Similarly, unsystematic risk is known as avoidable or diversifiable risk or market non-specific risk or company specific risk. It is caused due to internal factors such as negligence of management, lockouts, strikes called by unions, etc. It is calculated as:

Unsystematic Risk = Total Risk – Systematic Risk

$$= \text{Var}(R_i) - \beta^2 \text{Var}(R_m)$$

Commercial Banks

Total, systematic and unsystematic risk and their proportions of the stocks of the commercial banks are presented in Table 4.7.

Table 4.7

Total Systematic and Unsystematic Risk of CS of CBs and their Proportion

Commercial Banks	Total Risk (VAR)	Systematic Risk [S² Var (R_m)]	Proportion of Systematic Risk	Unsystematic Risk	Proportion of Unsystematic Risk
BOK	48.71%	0.31%	0.006	48.40%	0.994
HBL	10.37%	8.25%	0.80	2.12%	0.20
NABIL	53.14%	1.46%	0.03	51.68%	0.97
NIBL	16.76%	0.83%	0.05	15.93%	0.95

Source: Appendix 2 & 4

The statistical results depicted in Table 4.7 segregates the total risks of the respective four banks into systematic and unsystematic proportion. The stocks of BOK, HBL, NABIL and NIBL have the systematic risks of 0.31%, 8.25%, 1.46%, and 0.83% respectively. As compared to the other three banks, the shares of HBL has the highest systematic risk i.e. 8.25% where as the share of BOK has the

lowest systematic risk. On the basis of systematic risk, the stock of the BOK is more attractive than others. The stocks of HBL appear most risky.

Out of total risk of individual stocks' return, the proportion of systematic risks of BOK, HBL, NABIL and NIBL are 0.006, 0.8, 0.03 and 0.05 respectively. It seems that 0.6% variability of returns of the common stocks of BOK is systematic or is caused by market factors and hence cannot be diversified by forming efficient portfolio. Likewise, 80% risk of HBL is caused due to factors or forces in the market. Similarly, 3% and 5% of NABIL and NIBL are caused due to market factors. These cannot be reduced or diversified away.

Considering the unsystematic risks, the unsystematic risks of BOK, HBL, NABIL and NIBL are 48.40%, 2.12%, 51.68%, and 15.93% respectively. Among them, the stock of NABIL has the greatest unsystematic risk and HBL has the least unsystematic risk. Out of total risks of BOK, HBL, NABIL and NIBL, the respective proportions of unsystematic risk or company specific risk over total risk are 99.40%, 20%, 97%, and 95%, which can be diversified away with an optimal portfolio construction. BOK has the highest company specific risk of 99%. From the unsystematic risk perspective, the management errors or company specific risk of BOK are the highest among all. In other words, out of total risk, 99.40% of BOK, 20% of HBL, 97% of NABIL, and 95% of NIBL can be diversified away. The systematic as well as unsystematic risks of the common stocks of commercial banks are in Figure 4.8

4.4 Portfolio Analysis

4.4.1 CAPM Equation/SML

Using CAPM the investor can estimate the required rate of return for the stock. The intrinsic value of stock is inversely related to required rate of return. If other things remaining the same, the higher required rate of return will lower the intrinsic value of stock. CAPM theory helps for pricing implication of common stocks.

The relationship between an asset returns and its systematic risk can be expressed by the CAPM, which is also called security market line. SML is the line showing the relationship between the systematic risk index (beta) and required rate of return. The equation for the CAPM or SML is;

$$\text{Required Rate of Return (R}_j\text{)} = R_f + (R_m - R_f) \beta_j$$

Where,

R_f = Risk free rate of return

R_m = Expected return on market portfolio

B = Beta or Systematic risk index of assets j

Calculation of required rate of return and comparing with expected rate of return are shown on table.

Table 4.8

Pricing Situation of the Stocks of the Commercial Banks

Commercial Banks	R_f (%)	R_m (%)	Beta Coefficient	Required Rate of Return $R_j = R_f + (R_m - R_f) \beta_j$	Average Rate of Return(R_j)	Overprice or Under-Price
BOK	3.50	27.86	0.17	7.64	68.79%	Under priced
HBL	3.50	27.86	0.88	24.94	38.91%	Under priced
NABIL	3.50	27.86	0.37	12.51	77.77%	Under priced
NIBL	3.50	27.86	0.28	10.32	33.01%	Under priced

Source: Appendix - 2 & 4

The Table 4.8 shows that the average risk free rate of five years as given by the interest rate on short-term government treasury bills is 3.50% (annex). Similarly, the required rate of return on the market is also high, which is just 27.86 because of fluctuation NEPSE index. Thus the calculated required rate of returns on stocks as given by the table are 7.64%, 24.94%, 12.51% and 10.32% for the BOK, HBL, NABIL and NIBL respectively. The required rate of return on stock comprises of risk free rate of return (guaranteed rate of return) plus extra return (premium) for bearing risk. However, for all commercial banks, the average or mean rate of return obtained from its investment is found very high as compared to the rate of return required using Capital assets pricing model (CAPM) approach. This reveals that the stocks of all the four sampled banks are severely under priced. And hence they should be bought and not sold sort. Thus, an investor can invest in all or either of these stocks as the prices of the banks' stocks is growing in the future.

4.4.2 Portfolio Risk and Return

Portfolio analysis of risk and return are based on the investment on single assets. The analysis of risk and return made up was only as a point of view of individual investors that if he should invest in which banks securities. Which banks securities is more risky to comparing with each other. Construction of portfolio or making an investment in more than one asset which are negative correlated can reduce unsystematic risk without losing any return.

This attempt is to make which of the commercial bank among the simple bank has constructing a portfolio to reduce risk and increase its return. The analysis is based on two assets portfolio risk free assets (i.e. government securities) and risky asset (i.e. share and debenture). Risk free assets are denoted by (f) and risky assets are denoted by (m). Portfolio of risky assets is also known as market portfolio.

$$\text{Expected Return on Portfolio } (R_p) = W_m R_m + W_{rf} R_f$$

Where, W_m = Weight of market portfolio or risk assets

W_{rf} = Weight of risk free assets

R_f = Risk free assets

\bar{R}_m = Expected return on market portfolio

$$\text{Risk on Portfolio } (\sigma_p) = W_m \sigma_m$$

Total risk for two security portfolio

$$\begin{aligned} \sigma_p &= \sqrt{W_{rf}^2 \sigma_{rf}^2 + W_m^2 \sigma_m^2 + 2W_{rf} W_m \rho_{rf,m} \sigma_{rf} \sigma_m} \\ &= \sqrt{W_{rf}^2 \sigma_{rf}^2 + W_m^2 \sigma_m^2 + 2W_{rf} W_m \rho_{rf,m} \sigma_{rf} \sigma_m} \\ &= \sqrt{W_m^2 \sigma_m^2} \\ \dots \sigma_p &= W_m \sigma_m \end{aligned}$$

Note: Risk (Standard Deviation) of risk free assets = 0

Table 4.9

Portfolio Risk and Return of Commercial Bank

Commercial Banks	Risk Free Rate (R_f)	(R_m)	W_{rf}	W_m	R_p (%)	σ_p (%)
BOK	3.50%	27.86%	0.8311	0.1689	23.74	27.12
HBL	3.50%	27.86%	0.6380	0.3620	19.04	20.82
NABIL	3.50%	27.86%	0.5370	0.4630	16.58	17.52
NIBL	3.50%	27.865	0.4687	0.5313	14.92	15.29

Sources: Appendix 2 & 3

The above table shows that portfolio of return and risk of commercial banks. Risk free rate of return for all commercial banks is 3.50%. BOK has the highest portfolio return i.e. 23.74% and NIBL has the lowest portfolio return i.e. 14.92% among four commercial banks, with together its has the highest total risk on portfolio σ_p i.e. 27.12% highly risky assets took the company in lowest portfolio return. Likewise, NIBL has invested only 53.13% of its total investment in risky assets and remaining 46.87% of its total investment in risk free assets. So, it has the lowest portfolio return and it has also the lowest portfolio risk σ_p i.e. 15.29% among four commercial banks. Other bank HBL and NABIL has a portfolio return

of 19.04% and 16.58% respectively. These banks have invested 36.20% and 46.30% of total investment on risky assets and remaining 63.80% and 53.70% of its total investment on risk free assets respectively. They have portfolio risk $f_p A$ is 20.82% and 17.52% respectively. So from above calculation it can be concluded that higher the investment in risk free assets (Government Securities) lower will be the risk and lower the return also, but if higher the investment in risky assets (Share and Debenture) higher will be the risk and higher will be the return. But sometimes higher investment in risky assets took the company in negative portfolio.

4.5 Portfolio Performance Evaluation

Sharp's Portfolio Performance Measure

Portfolio performance evaluation on the basis of return only will be insufficient. Therefore, it is necessary to consider both risk and return. One performance measure that has been developed to evaluate a portfolio's performance considering both risk and return simultaneously is the Sharpe's index of portfolio performance. This measure is also known as reward-to-variability ratio and is used to rank the performance of investment funds. Symbolically it is;

$$S_p = \frac{\text{Risk Premium}}{\text{Total Risk}} \times \frac{\bar{r}_p - r_f}{\sigma_p}$$

Where,

SP = Sharp index of portfolio performance of portfolio

\bar{r}_p = Average return on portfolio

r_f = Risk free rate of return

σ_p = Standard deviation of portfolio

$$\bar{r}_p - r_f \times \text{Risk Premium for portfolio}$$

Table 4.10

Portfolio Performance Measure using Sharp's Measure

Commercial Banks	Risk Free Rate (R_f)	Average Return on Portfolio (R_p)	Standard Deviation of Portfolio $f_p A$	S_p	Ranking
BOK	3.50%	23.74	27.12	0.7463	4
HBL	3.50%	19.04	20.82	0.7464	3
NABIL	3.50%	16.58	17.52	0.7466	2
NIBL	3.50%	14.92	15.29	0.7469	1

Source: Appendix 2 & 4

The above table shows that Sp of stock of all banks is positive. BOK has lowest positive Sp i.e. 0.7463 and NIBL has highest positive Sp i.e. 0.7469 and other banks NABIL and HBL has 0.7466 and 0.7464 respectively. On the basis of Sharpe index, the portfolio of NIBL is the best performer. Then after are NABIL, HBL and BOK respectively.

4.6 Formation of Two-Asset Portfolio

As stated in the methodology, six portfolios of two banks at a time were formulated and their risks and returns have been calculated respectively with respect to various weights. The weights regarding formation of portfolio were chosen on a random basis providing various options to the individual investors.

$$\text{Return on Portfolio, } (R_p) = w_1 \cdot E(R_1) + w_2 \cdot E(R_2)$$

$$\text{Variance of Portfolio, } (\exists_p)^2 = w_1^2 \cdot \exists_1^2 + w_2^2 \cdot \exists_2^2 + 2 \cdot w_1 \cdot w_2 \cdot \text{Cov}(R_1, R_2)$$

or

$$\text{Variance of Portfolio, } (\exists_p)^2 = w_1^2 \cdot \exists_1^2 + w_2^2 \cdot \exists_2^2 + 2 \cdot w_1 \cdot w_2 \cdot \exists_1 \cdot \exists_2 \cdot \partial_{12}$$

$$\exists_p = \sqrt{\text{Variance}}$$

a. BOK and HBL

Expected return on BOK, $E(R_1) = 68.79\%$

Expected return on HBL, $E(R_2) = 38.91\%$

Standard deviation of returns on BOK, $\Xi_1 = 69.34\%$

Standard deviation of returns on HBL, $\Xi_2 = 32.20\%$

Covariance of returns between stocks of two banks, $Cov(R_1, R_2) = 43\%$

Table 4.11
Investment in BOK and HBL

Proportionate Investment in BOK's Stock (W_1)	Proportionate Investment in HBL's Stock (W_2)	Expected Return on Portfolio (R_p) = $W_1 \cdot E(R_1) + W_2 \cdot E(R_2)$	Portfolio Standard Deviation (\uparrow_p)
1.00	0.00	68.79	69.34
0.80	0.20	62.81	55.86
0.60	0.40	56.84	43.61
0.50	0.50	53.85	38.30
0.40	0.60	50.86	33.87
0.20	0.80	44.89	29.29
0.00	1.00	38.91	32.20

The Table 4.11 shows the portfolio risks and returns consisting of the two banks BOK and HBL. The proportionate weights of investments in the stocks of two banks are chosen on a random basis. Putting all of the investments in stocks of BOK provides the highest return of 68.79% with the highest risk (standard deviation) of 69.34%. The lowest return on portfolio return and risk is 38.91% and 32.20% with all of the investments in HBL's stock. The risk and return of the portfolio consisting of two banks seemed to be decreasing with the respective decrease in investment in BOK and increase in HBL. The risk has not been significantly diversified with respect to various random portfolio weights because of positive correlation coefficient between returns of BOK and HBL.

b. BOK and NIBL

Expected return on BOK, $E(R_1) = 68.79\%$

Expected return on NIBL, $E(R_2) = 33.01\%$

Standard deviation of returns on BOK, $\Xi_1 = 69.34\%$

Standard deviation of returns on NIBL, $\Xi_2 = 40.93\%$

Covariance of returns between stocks of two banks, $Cov(R_1, R_2) = 24.89\%$

Table 4.12
Investment in BOK and NIBL

Proportionate Investment in BOK's Stock (W_1)	Proportionate Investment in NIBL's Stock (W_2)	$(R_p) = W_1 \cdot E(R_1) + W_2 \cdot E(R_2)$	Portfolio Standard Deviation (Ξ_p)	Remarks
1.00	0.00	68.79	69.34	Highest return, Higher risk
0.80	0.20	61.63	56.08	
0.60	0.40	54.48	44.74	
0.50	0.50	50.90	40.30	
0.40	0.60	47.32	37.08	
0.20	0.80	40.17	35.58	Lowest risk
0.00	1.00	33.01	40.93	Low return

The Table 4.12 depicts the portfolio returns and risks consisting of stocks of two banks, viz: BOK and NIBL, with respect to various proportionate weights of investments. The portfolio risk is low at a proportionate investment of 0.20 or 20% in BOK and 0.80 or 80% in NIBL. The minimum standard deviation obtained in the table is 35.58% with a return of 40.17%. However, it is seemed irrelevant to invest solely in stocks of BOK as it has higher risk at a level of lower return.

c. BOK and NABIL

Expected return on BOK, $E(R_1) = 68.79\%$

Expected return on NABIL, $E(R_2) = 77.77\%$

Standard deviation of returns on BOK, $\Xi_1 = 69.34\%$

Standard deviation of returns on NABIL, $\exists_2 = 72.89\%$

Covariance of returns between stocks of two banks, $\text{Cov}(R_1, R_2) = 54.89\%$

Table 4.13

Investment in BOK and NABIL

Proportionate Investment in BOK's Stock (W_1)	Proportionate Investment in NABIL's Stock (W_2)	$(R_p) = W_1 \cdot E(R_1) + W_2 \cdot E(R_2)$	Portfolio Standard Deviation (σ_p)	Remarks
1.00	0.00	68.79	69.34	
0.80	0.20	70.59	57.38	
0.60	0.40	72.38	50.87	
0.50	0.50	73.28	50.37	Lowest Risk
0.40	0.60	74.18	51.85	
0.20	0.80	75.97	59.96	
0.00	1.00	77.77	72.89	

The Table 4.13 shows the various portfolio risks and returns of BOK and NABIL with respect to various weights of investments between them. As BOK has the highest average return and medium risk, the investors investing all of their funds in stocks of BOK only gets the highest return and assumes the moderate risk in turn. The risk and return goes on decreasing simultaneously as the investment in BOK is decreased and the investment in NABIL is increased. The risk is low at an investment level of 50% in BOK and 50% in NABIL.

d. HBL and NIBL

Expected return on HBL, $E(R_1) = 38.91\%$

Expected return on NIBL, $E(R_2) = 33.01\%$

Standard deviation of returns on HBL, $\exists_1 = 32.20\%$

Standard deviation of returns on NIBL, $\exists_2 = 40.93\%$

Covariance of returns between stocks of two banks, $\text{Cov}(R_1, R_2) = 30.27\%$

Table 4.14**Investment in HBL and NIBL**

Proportionate Investment in HBL's Stock (W_1)	Proportionate Investment in NIBL's Stock (W_2)	(Rp) = $W_1 \cdot E(R_1) + W_2 \cdot E(R_2)$	Portfolio Standard Deviation (σ_p)	Remarks
1.00	0.00	38.91	32.20	Highest return
0.80	0.20	37.73	27.06	
0.60	0.40	36.55	25.39	Lowest risk
0.50	0.50	35.96	26.11	
0.40	0.60	35.37	27.79	
0.20	0.80	34.19	33.39	
0.00	1.00	33.01	40.93	

The Table 4.14 depicted above shows the combined risk and return of various portfolios formed by combination of various weights of investment in HBL and NIBL. On the basis of calculations, the risk given by standard deviation is found minimum with a moderate return of 25.39% at proportionate investments of 0.60 or 60% and 0.40 or 40% in the stocks of HBL and NIBL respectively. Otherwise, the highest return can be obtained by investing all of the funds in NIBL at a higher level of risk. The portfolio returns obtained from the combination of stocks of HBL and NIBL do not seem significant as they both have lower returns and as their correlation coefficient was highly positive.

e. HBL and NABIL

Expected return on HBL, $E(R_1) = 38.91\%$

Expected return on NABIL, $E(R_2) = 77.77\%$

Standard deviation of returns on HBL, $\sigma_1 = 32.20\%$

Standard deviation of returns on NABIL, $\sigma_2 = 72.89\%$

Covariance of returns between stocks of two banks, $Cov(R_1, R_2) = 23.21\%$

Table 4.15**Investment in HBL and NABIL**

Proportionate Investment in HBL's Stock (W_1)	Proportionate Investment in NABIL's Stock (W_2)	(Rp) = $W_1 \cdot E(R_1) + W_2 \cdot E(R_2)$	Portfolio Standard Deviation (σ_p)	Remarks
1.00	0.00	38.91	32.20	
0.80	0.20	46.68	29.62	Lowest Risk
0.60	0.40	54.45	35.01	
0.50	0.50	58.34	39.88	
0.40	0.60	62.23	45.62	
0.20	0.80	69.99	58.68	
0.00	1.00	77.77	72.89	Highest Return

The Table 4.15 depicted above shows the combined risk and return of various portfolios formed by combination of various weights of investment in HBL and NABIL. On the basis of calculations, the risk given by standard deviation is found minimum with a moderate return of 29.62% at proportionate investments of 0.80 or 80% and 0.20 or 20% in the stocks of HBL and NABIL respectively. Otherwise, the highest return can be obtained by investing all of the funds in HBL at a moderate level of risk. This is because HBL's stock has high value in the market as compared to NABIL in many respects. Investors should not invest all of their available funds in the stocks of NABIL only as there is higher risk and lower return. However, if the funds are invested on both the stocks at some proportion, the risk can be diversified to some extent.

f. NIBL and NABIL

Expected return on NIBL, $E(R_1) = 33.01\%$

Expected return on NABIL, $E(R_2) = 77.77\%$

Standard deviation of returns on NIBL, $\sigma_1 = 40.93\%$

Standard deviation of returns on NABIL, $\sigma_2 = 72.89\%$

Covariance of returns between stocks of two banks, $Cov(R_1, R_2) = 64.61\%$

Table 4.16

Investment in NIBL and NABIL

Proportionate Investment in NIBL's Stock (W_1)	Proportionate Investment in NABIL's Stock (W_2)	(R_p) = $W_1 \cdot E(R_1)$ + $W_2 \cdot E(R_2)$	Portfolio Standard Deviation (σ_p)	Remarks
1.00	0.00	33.01	40.93	
0.80	0.20	41.96	35.89	Lowest risk
0.60	0.40	50.91	38.22	
0.50	0.50	55.39	41.89	
0.40	0.60	59.87	46.78	
0.20	0.80	68.82	58.91	
0.00	1.00	77.77	72.89	Highest Return

The Table 4.16 depicts the portfolio risk and returns of two commercial banks NIBL and NABIL combined in different proportions. As per the calculation, the lowest risk given by standard deviation of returns on portfolio is 35.89% at a return of 41.96%. Risk-averse investors choose this set of portfolio, where the proportionate weight of investment in stock of NIBL is 0.80 or 80% and in stock of NABIL is 0.20 or 20%.

4.7 Computation of Risk and Return for Three Assets Portfolio (Appendix 4 and 7)

Return on Portfolio, $R_p = w_1 \cdot E(R_1) + w_2 \cdot E(R_2) + w_3 \cdot E(R_3)$

Variance of Portfolio, $\sigma_p^2 = w_1^2 \cdot \sigma_1^2 + w_2^2 \cdot \sigma_2^2 + w_3^2 \cdot \sigma_3^2 + 2 \cdot w_1 \cdot w_2 \cdot \text{Cov}(R_1, R_2) + 2 \cdot w_2 \cdot w_3 \cdot \text{Cov}(R_2, R_3) + 2 \cdot w_1 \cdot w_3 \cdot \text{Cov}(R_1, R_3)$

$\sigma_p = \sqrt{\text{Variance}}$

a. BOK, NIBL and HBL

Return on stocks of BOK, $E(R_1) = 68.79\%$

Return on stocks of NIBL, $E(R_2) = 33.01\%$

Return on stocks of HBL, $E(R_3) = 38.91\%$

Standard deviation of BOK, $\exists_1 = 69.34\%$

Standard deviation of NIBL, $\exists_2 = 40.93\%$

Standard deviation of HBL, $\exists_3 = 32.20\%$

Covariance (R_1, R_2) = 24.89%

Covariance (R_2, R_3) = 30.27%

Covariance (R_3, R_1) = 43%

Table 4.17

Investment in BOK, NIBL and HBL

Proportionate Investment in BOK's Stock (W_1)	Proportionate Investment in NIBL's Stock (W_2)	Proportionate Investment in HBL's Stock (W_3)	R_p (%)	\dagger_p (%)	Remarks
0.80	0.10	0.10	62.22	55.82	High Risk High Return
0.70	0.20	0.10	58.65	49.47	
0.70	0.10	0.20	59.24	49.30	
0.60	0.20	0.20	55.66	43.11	
0.50	0.30	0.20	52.08	37.60	
0.40	0.40	0.20	48.50	33.14	
0.30	0.50	0.20	44.92	30.19	
0.20	0.60	0.20	41.35	29.22	
0.333	0.333	0.333	46.86	29.25	
0.10	0.50	0.40	38.95	25.51	Lowest Risk
0.10	0.60	0.30	38.36	27.59	
0.10	0.70	0.20	37.77	30.40	
0.10	0.80	0.10	37.18	33.77	
0.05	0.90	0.05	35.09	37.10	
0.20	0.20	0.60	43.71	25.54	
0.20	0.10	0.70	44.30	27.10	
0.10	0.10	0.80	41.31	27.21	
0.05	0.05	0.90	40.11	29.37	

The Table 4.17 depicted above shows that higher amount of investment in NIBL gives the higher return and in turn higher risk to the investors. While selecting the portfolio, the portfolio having higher return with equal risk is chosen. The best

option for risk-averse investors, on the basis of above table, is investing 80% (0.80) in BOK stock, 10% (0.10) in NIBL and HBL of total investing funds in HBL. At this portfolio of three commercial banks, the investors will be able to reduce the risk to a minimum extent of 55.82% at a level of return of 62.22%.

b. BOK, NIBL and NABIL

Return on stocks of BOK, $E(R_1) = 68.79\%$

Return on stocks of NIBL, $E(R_2) = 33.01\%$

Return on stocks of NABIL, $E(R_3) = 77.77\%$

Standard deviation of BOK, $\Xi_1 = 69.34\%$

Standard deviation of NIBL, $\Xi_2 = 40.93\%$

Standard deviation of NABIL, $\Xi_3 = 72.89\%$

Covariance $(R_1, R_2) = 24.89\%$

Covariance $(R_2, R_3) = 64.61\%$

Covariance $(R_3, R_1) = 54.89\%$

Table 4.18
Investment in BOK, NIBL and NABIL

Proportionate Investment in BOK's Stock (W_1)	Proportionate Investment in NIBL's Stock (W_2)	Proportionate Investment in NABIL's Stock (W_3)	R_p (%)	\uparrow_p(%)	Remarks
0.80	0.10	0.10	66.11	56.22	
0.70	0.20	0.10	62.53	49.93	
0.70	0.10	0.20	67.01	51.06	
0.60	0.20	0.20	63.43	45.11	
0.50	0.30	0.20	59.85	39.89	
0.40	0.40	0.20	56.27	35.73	
0.30	0.50	0.20	52.70	33.03	
0.20	0.60	0.20	49.12	32.15	Lowest Risk
0.333	0.333	0.333	59.80	36.61	
0.10	0.50	0.40	54.49	36.74	
0.10	0.60	0.30	50.02	34.04	
0.10	0.70	0.20	45.54	33.25	
0.10	0.80	0.10	41.06	34.48	
0.05	0.90	0.05	37.04	37.29	Low Return
0.20	0.20	0.60	67.02	46.93	
0.20	0.10	0.70	71.50	53.27	
0.10	0.10	0.80	72.40	59.03	
0.05	0.05	0.90	75.08	65.81	High Risk, High Return

The Table 4.18 and the respective figure portrayed above shows the different proportions of portfolio investments in stocks of BOK, NIBL and NABIL and their respective risks and returns. On the basis of calculated risks and returns, the optimal portfolio for a risk-averse investor is found by investing 5%, 5% and rest 90% of total investing funds in stocks of BOK, NIBL and NABIL respectively. At this portfolio weight, the risk is 65.81%, which is the least of all options, and the return is 75.08%.

c. BOK, HBL and NABIL

Return on stocks of BOK, $E(R_1) = 68.79\%$

Return on stocks of HBL, $E(R_2) = 38.91\%$

Return on stocks of NABIL, $E(R_3) = 77.77\%$

Standard deviation of BOK, $\Xi_1 = 69.34\%$

Standard deviation of HBL, $\Xi_2 = 32.20\%$

Standard deviation of NABIL, $\Xi_3 = 72.89\%$

Covariance $(R_1, R_2) = 43\%$

Covariance $(R_2, R_3) = 23.21\%$

Covariance $(R_3, R_1) = 54.89\%$

Table 4.19
Investment in BOK, HBL and NABIL

Proportionate Investment in BOK's Stock (W₁)	Proportionate Investment in HBL's Stock (W₂)	Proportionate Investment in NABIL's Stock (W₃)	R_p (%)	†_p(%)	Remarks
0.80	0.10	0.10	66.7	56.19	
0.70	0.20	0.10	63.71	49.71	
0.70	0.10	0.20	67.60	51.00	
0.60	0.20	0.20	64.61	44.84	
0.50	0.30	0.20	61.62	39.17	
0.40	0.40	0.20	58.63	34.26	
0.30	0.50	0.20	55.65	30.47	
0.20	0.60	0.20	52.66	28.26	
0.333	0.333	0.333	61.76	35.55	
0.10	0.50	0.40	57.44	34.28	
0.10	0.60	0.30	53.56	30.27	
0.10	0.70	0.20	49.67	27.99	
0.10	0.80	0.10	45.78	27.87	Lowest Risk
0.05	0.90	0.05	42.35	29.52	
0.20	0.20	0.60	68.20	46.57	
0.20	0.10	0.70	72.09	53.16	
0.10	0.10	0.80	72.99	58.92	
0.05	0.05	0.90	75.38	65.77	Highest Risk, Highest Return

The Table 4.19 represents the various portfolio risks and returns with regards to various proportionate weights of investments in BOK, HBL and NABIL. The minimum risk portfolio weights of investment in stocks of BOK, HBL and NABIL on the basis of above calculations are 0.05 or 5%, 0.05 or 5% and 0.90 or 90% respectively. And the minimum standard deviation thus obtained is 65.77% at a return of 75.38%. For risk seeking investors, investing higher amount in stocks of NABIL, where the amount of risk is also higher, can maximize the return. It is

because NABIL has the highest performance in the market and its price also has been increasing frequently.

d. NIBL, HBL and NABIL

Return on stocks of NIBL, $E(R_1) = 33.01\%$

Return on stocks of HBL, $E(R_2) = 38.91\%$

Return on stocks of NABIL, $E(R_3) = 77.77\%$

Standard deviation of NIBL, $\Xi_1 = 40.93\%$

Standard deviation of HBL, $\Xi_2 = 32.20\%$

Standard deviation of NABIL, $\Xi_3 = 72.89\%$

Covariance $(R_1, R_2) = 30.27\%$

Covariance $(R_2, R_3) = 23.21\%$

Covariance $(R_3, R_1) = 64.61\%$

Table 4.20**Investment in NIBL, HBL and NABIL**

Proportionate Investment in NIBL's Stock (W_1)	Proportionate Investment in HBL's Stock (W_2)	Proportionate Investment in NABIL's Stock (W_3)	R_p (%)	\dagger_p (%)	Remarks
0.80	0.10	0.10	38.08	33.93	
0.70	0.20	0.10	38.67	30.56	
0.70	0.10	0.20	42.55	32.67	
0.60	0.20	0.20	43.14	29.69	
0.50	0.30	0.20	43.73	27.38	
0.40	0.40	0.20	44.32	25.89	
0.30	0.50	0.20	44.91	25.38	Lowest Risk
0.20	0.60	0.20	45.50	25.90	
0.333	0.333	0.333	49.85	30.27	
0.10	0.50	0.40	53.86	33.82	
0.10	0.60	0.30	49.98	29.73	
0.10	0.70	0.20	46.09	27.40	
0.10	0.80	0.10	42.21	27.26	
0.05	0.90	0.05	40.56	29.37	
0.20	0.20	0.60	61.05	45.22	
0.20	0.10	0.70	64.93	51.99	
0.10	0.10	0.80	69.41	58.67	
0.05	0.05	0.90	73.59	65.71	Highest Risk, Highest Return

The Table 4.20 represents the various portfolio risks and returns with regards to various proportionate weights of investments in NIBL, HBL and NABIL. The minimum risk portfolio weights of investment in stocks of NIBL, HBL and NABIL on the basis of above calculations are 0.05 or 5%, 0.05 or 5% and 0.90 or 90% respectively. And the minimum standard deviation thus obtained is 65.71% at a return of 73.59%. For risk seeking investors, higher return can be obtained by investing higher amount in stocks of NABIL, where the amount of risk is also higher. It is because NABIL has the highest performance in the market as compared to other two banks and its price also has been increasing frequently.

4.8 Major Findings of the Study

- The mean or average rate of return of BOK stock was found to be 68.79% with a standard deviation of returns of 69.34%. Similarly, the average rate of return on stocks of HBL, NABIL and NIBL were obtained as 38.91%, 77.77% and 33.01% with standard deviations of 32.20%, 72.89% and 40.93% respectively. Likewise, the coefficient of variation for BOK, HBL, NABIL and NIBL were thus found to be 100.80%, 84.51%, 93.73% and 123.99% respectively. This indicates that the risk per unit of return of NABIL is the highest of all banks.
- The average rate of return on market given by NEPSE index was quite high, which was just 27.86%. Similarly, the variance of market returns was 1064.50% and the standard deviation of overall market returns was 32.63%. The calculated beta coefficients of the banks BOK, HBL, NABIL and NIBL were 0.17, 0.88, 0.37 and 0.28 respectively. HBL stock sensitivity with the market is the highest of all. The stocks of BOK, HBL, NABIL and NIBL were defensive as compared to the market.
- The total risk of the banks measured by the variance (or standard deviation) has been partitioned into systematic and unsystematic components. The variances of the returns over the study period were 48.71%, 10.37%, 53.14% and 16.76% for BOK, HBL, NABIL and NIBL respectively. The unsystematic risks for the banks BOK, HBL, NABIL and NIBL in absolute terms were 48.04%, 2.12%, 51.68% and 15.93% respectively. The proportions of unsystematic risk over total risk for the banks BOK, HBL, NABIL and NIBL were 0.994, 0.20, 0.97 and 0.95 respectively. That means BOK has the highest proportion of unsystematic risk in its total risk component.
- The required rates of returns of three banks BOK, HBL, NABIL and NIBL using CAPM approach were obtained as 7.64%, 24.94%, 12.51% and 10.32% respectively. Since the average rate of returns for the four banks

were too much higher than the required or equilibrium rates of returns, the stocks of the four sampled commercial banks can be stated to be severely under-priced. The stocks of these four banks are lucrative to buy. Hence, investment can be made on stocks of any one or all or either set of two or three banks.

- The Sharpe index portfolio performance measure of BOK, HBL, NABIL and NIBL seemed 0.7463, 0.7464, 0.7466 and 0.7469 respectively. The portfolio performance measure index of NIBL seemed highest and that of BOK seemed the lowest among all. On the basis of Sharpe index, the portfolio of NIBL is the best performer. Then after are NABIL, HBL and BOK.
- Two assets portfolio were formed with random weights of investment out of four sampled banks. Using the combination of four banks' stocks taken two at a time, six different combinations of portfolios were formed. The weights of investment in two banks were chosen on random basis with the total weight equal to 1.0.
- BOK provides the highest return of 68.79% with the highest risk (standard deviation) of 69.34%. The lowest return on portfolio return and risk is 38.91% and 32.20% with all of the investments in HBL's stock. The risk and return of the portfolio consisting of two banks seemed to be decreasing with the respective decrease in investment in BOK and increase in HBL.
- The portfolio risk is low at a proportionate investment of 0.20 or 20% in BOK and 0.80 or 80% in NIBL. The minimum standard deviation obtained in the table is 35.58% with a return of 40.17%.
- The various portfolio risks and returns of BOK and NABIL with respect to various weights of investments between them. The risk is low at an investment level of 50% in BOK and 50% in NABIL.
- Portfolios formed by combination of various weights of investment in HBL and NIBL. On the basis of calculations, the risk given by standard deviation is found minimum with a moderate return of 25.39% at proportionate

- investments of 0.60 or 60% and 0.40 or 40% in the stocks of HBL and NIBL respectively.
- The risk given by standard deviation is found minimum with a moderate return of 29.62% at proportionate investments of 0.80 or 80% and 0.20 or 20% in the stocks of HBL and NABIL respectively. Otherwise, the highest return can be obtained by investing all of the funds in HBL at a moderate level of risk.
 - The lowest risk given by standard deviation of returns on portfolio is 35.89% at a return of 41.96%. Risk-averse investors choose this set of portfolio, where the proportionate weight of investment in stock of NIBL is 0.80 or 80% and in stock of NABIL is 0.20 or 20%.
 - The minimum standard deviation of portfolio return obtained from the given set of portfolios formed by combination of three banks: BOK, NIBL and HBL were 25.51% providing the portfolio return of 38.95%. Thus the minimum risk portfolio weight from the available ones was 0.10 in BOK, 0.50 in NIBL and 0.40 in HBL. However, the investors depending upon their risk preferences can choose other possible efficient portfolios.
 - Similarly, the least standard deviation of returns was found at a portfolio weight of investment of 0.20 in BOK, 0.60 in NIBL and 0.20 in NABIL. The standard deviation of returns at this proportion was 32.15% with a return of 49.12%. In the same manner, rational investors can choose other possible efficient portfolios.
 - Again the minimum risk portfolio weight consisting of stocks of BOK, HBL and NABIL was 0.10, 0.80 and 0.10 respectively. At this proportionate of investment, the risk was found to be minimum at 27.87% and the return from the portfolio was 45.78%.
 - Again another set of portfolio consisting of stocks of three banks viz: NIBL, HBL and NABIL were formed with the similar respective weights. The lowest standard deviation from the portfolio was found as 25.38% with corresponding return of 44.91%. And the minimum risk portfolio weight of investment from this set was 0.30 in NIBL, 0.50 in HBL and 0.20 in NABIL.

CHAPTER – V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

This chapter summarizes the whole study. Summary of the study has been mentioned in the first section. The second section reflects the conclusion drawn from the study. The third part is recommendation, to erase the weakness draw backs of concern banks and portfolio investment on the basis of findings & conclusion of the study.

Commercial Banks play a vital role in the economic development of the country. It occupies an important place in the framework of the every economy. It provides capital for the development of industry, trade, business and other resource deficit sectors by investing the savings collected as deposits. Besides this, Commercial Banks provide numerous services to their customers in view of facilitating their economic and social life. The accepting of deposits, providing loans to the needy person and organizations are its main functions. The other services performed by banks are payment of subscription, purchase and sale of securities, remittance of money, advisory services, and assistance in foreign trade etc. Hence, the Commercial Banks play an important role in the modern economy.

The economic development is possible only when domestic resources are properly mobilized and utilized. Similarly, for integrated and speedy development of the country the competitive banking and financial services should reach every corner of the country. Successful formulation and effective implementation of investment policy is the prime essential for the successful performance of banks and other financial institutions. A good investment policy has a positive impact on economic development of the country and vice versa.

Every bank invests its money in some profitable financial sector, which may result in profitable business in the long run. An investment is the commitment of money that is expected to generate additional money. So expecting the additional return, we should sacrifice the current resources. In addition, whenever we talk about the return, risk too must not be avoided, because in every type of return, risk is also involved in it. Further Portfolio Management activities of Nepalese Commercial Banks are in developing stage. The reason behind not using such activities by commercial banks may be due to unawareness about portfolio management and its usefulness, hesitation of taking risk and lack of proper techniques to run such activities in the best and successful manner.

Portfolio is a collection of different types of securities in different sectors. Portfolio Management is related to the efficient portfolio investment in financial assets. Portfolio Analysis considers the determination of future risk and return in holding various blends of individual securities. A portfolio simply represents the practice among the investment of having their funds in more than one asset. The combination of investment asset is called a portfolio. If an investor holds a well-diversified portfolio, then his concern should be the expected return and risk of portfolio rather than individual assets or securities. The portfolio theory provides a normative approach to the investors' decision to investment in assets or securities.

Most financial assets are not held in isolation, rather they are held as parts of portfolios. Portfolio theory deals with the selection of optimal portfolios i.e. portfolios that provide the highest possible return for any specified degree of risk or the lowest possible risk for any specified rate of return. Portfolio analysis considers the determination of future risk and return in holding various blends of individual securities.

Portfolio Risk Analysis is the process of measuring and assessing our portfolio's exposure to market risk. Financial Portfolio offers us three views on risk, allowing us to compare our portfolio to the market portfolio in terms of Risk-Adjusted Return, Value-at-Risk, and Market Risk Exposure. The various portfolio set were developed having negative correlation to each other. Investment alternatives were selected among those all portfolio sets using Markowitz portfolio (two assets portfolio) selection model with the help of minimum variance portfolio selection method. Sharpe's optimum portfolio index model used to find out to optimum portfolio among the sample securities.

The portfolio of assets usually offers advantage of reducing risk through diversification. A stock or securities held, as part of a portfolio is less risky than the same stock held in isolation. Thus, portfolio analysis helps to develop a portfolio that has the maximum return at whatever level of risk the investor considers appropriate.

This research study is concerned with the portfolio analysis of the four commercial banks named BOK, HBL, NABIL and NIBL. Investing in securities is not an old tradition in our society. Rather it is a new and a challenging one for individual investors. Investment in capital markets helps pooling of funds from the savers to the demanders. It provides best investment opportunities by transferring the funds from surplus saving to need based sectors through the transaction of financial instruments.

Financial instruments are traded in securities market. Stock market is the largest financial market all over the world where stocks of various business organizations are traded. It has the greatest role in the development of financial system. Capital market consists of (i) Primary Market and (ii) Secondary Market. The primary market is that financial market in which newly issued securities of corporations

and government bodies are offered to the investors for the first time. The secondary market is that financial market in which pre-owned/already issued securities are traded. NEPSE is the only secondary market in Nepal. Once the securities are issued into primary market, then they are traded in secondary market (NEPSE in the context of Nepal).

The investment process is concerned with how an investor should go about making decision with regard to what marketable securities to invest in how extensive the investment should be and when the investment should be made. Investment and speculation are two different terms although some irrational investors may use them interchangeably. There are no specialized investment analysts rendering professional services to the investors. The price of stocks is very much sensitive in a free market economy. The prices of commercial banks keep on changing haphazardly in the market. And the market economy is also unstable due to many factors. So the investment to be made in shares in the secondary market needs careful scrutiny and analysis of all the possible risk adjusted factors.

This study is based on secondary data obtained from securities board and NEPSE. Out of the recent 25 commercial banks, only four banks have been chosen on a random basis. The four sampled banks are BOK, HBL, NABIL and NIBL. Both descriptive as well as analytical research design have been applied in this research study. On due course, the individual risk and returns of the commercial banks for the period of five years has been calculated. Those risks and returns are analyzed and formed various portfolios consisting of two and three banks.

5.2 Conclusions

On the basis of various calculations and analysis, we have reached to the following conclusion:

NABIL has the highest average return over the study period as compared to other three banks. It is because of the severely increasing price of stocks of the bank. Similarly, the average return on NIBL is found to be the least of all three banks. Likewise, NABIL has also the highest standard deviation (risk) of returns and HBL has the lowest risk (given by standard deviation) on returns.

NIBL has the highest variation of returns per unit given by coefficient of variation. And HBL has the lowest risk per unit of return.

The average rate of returns on market was very low as compared to the banks. HBL has the highest beta coefficient and BOK has the lowest beta coefficient. The beta coefficients reveal that stocks of BOK, HBL, NABIL and NIBL are defensive and are more sensitive than the market returns.

BOK has the highest proportion of unsystematic risk. It means that the portfolio containing stocks of BOK are tricky to reduce the risks as higher proportion of BOK risk contains avoidable or unsystematic risk. However, the portfolio containing stocks of HBL can reduce the risk components, as it comprises of large amount of avoidable risks. NIBL also has higher component of systematic risk in its total risk composure.

The required return of the banks using CAPM approach suggests that the stocks of four sampled banks are under priced. Hence, they are all three banks are lucrative for investment as regards from individual investors' point of view. Thus, portfolio can be formed with any two, three or four assets at a time with proper proportionate of investment.

The Sharpe index of the portfolio between the stocks of NIBL seemed highest and that of BOK seemed the lowest among all. On the basis of Sharpe index, the portfolio of NIBL is the best performer. Sharpe index of portfolio performance measures also reveals that if investors are willing to create a well-diversified portfolio then they are required to create well diversified portfolio between the stocks of NIBL and BOK to maximize the return and minimize the risk.

In a two banks stock portfolio, BOK and NIBL combined has the highest set of portfolio return at a risk level of 40.17%. It was because the correlation coefficient between returns on stocks of these banks is slightly negative. Thus, Markowitz diversification works to some extent. Also the two assets portfolio set of BOK and NABIL is also efficient from the risk and return point of view. However, there are various set of portfolios left for investors to combine two banks' stocks at a time depending upon their risk bearing capacity, attitude towards risk, etc.

BOK provides the highest return of 68.79% with the highest risk (standard deviation) of 69.34%. The lowest return on portfolio return and risk is 38.91% and 32.20% with all of the investments in HBL's stock. The risk and return of the portfolio consisting of two banks seemed to be decreasing with the respective decrease in investment in BOK and increase in HBL. The portfolio risk is low at a proportionate investment of 0.20 or 20% in BOK and 0.80 or 80% in NIBL. The minimum standard deviation obtained in the Table is 35.58% with a return of 40.17%. The various portfolio risks and returns of BOK and NABIL with respect to various weights of investments between them. The risk is low at an investment level of 50% in BOK and 50% in NABIL. Portfolios formed by combination of various weights of investment in HBL and NIBL. On the basis of calculations, the risk given by standard deviation is found minimum with a moderate return of 25.39% at proportionate investments of 0.60 or 60% and 0.40 or 40% in the stocks of HBL and NIBL respectively. The risk given by standard deviation is found

minimum with a moderate return of 29.62% at proportionate investments of 0.80 or 80% and 0.20 or 20% in the stocks of HBL and NABIL respectively. Otherwise, the highest return can be obtained by investing all of the funds in HBL at a moderate level of risk. The lowest risk given by standard deviation of returns on portfolio is 35.89% at a return of 41.96%. Risk-averse investors choose this set of portfolio, where the proportionate weight of investment in stock of NIBL is 0.80 or 80% and in stock of NABIL is 0.20 or 20%.

The minimum standard deviation of portfolio return obtained from the given set of portfolios formed by combination of three banks: BOK, NIBL and HBL were 25.51% providing the portfolio return of 38.95%. Thus the minimum risk portfolio weight from the available ones was 0.10 in BOK, 0.50 in NIBL and 0.40 in HBL. However, the investors depending upon their risk preferences can choose other possible efficient portfolios. Similarly, the least standard deviation of returns was found at a portfolio weight of investment of 0.20 in BOK, 0.60 in NIBL and 0.20 in NABIL. The standard deviation of returns at this proportion was 32.15% with a return of 49.12%. In the same manner, rational investors can choose other possible efficient portfolios. Again the minimum risk portfolio weight consisting of stocks of BOK, HBL and NABIL was 0.10, 0.80 and 0.10 respectively. At this proportionate of investment, the risk was found to be minimum at 27.87% and the return from the portfolio was 45.78%. Again another set of portfolio consisting of stocks of three banks viz: NIBL, HBL and NABIL were formed with the similar respective weights. The lowest standard deviation from the portfolio was found as 25.38% with corresponding return of 44.91%. And the minimum risk portfolio weight of investment from this set was 0.30 in NIBL, 0.50 in HBL and 0.20 in NABIL.

5.3 Recommendations

On the basis of various calculations, major findings and in-depth analysis of the risk and return, we can recommend the following suggestions:

- Since the stocks of four sampled banks are found under-priced, investors should buy or hold long position on stocks of these four banks.
- Investors may choose any set of portfolio lying in efficient frontier curve depending upon their attitude towards risk. The formation and selection of the portfolio should be based on risk and return. Likewise, investment on inefficient portfolios should be avoided.
- Investment portfolio shows that all commercial banks are investing its more funds on government securities (i.e. risk free assets) which caused low return on its investment. So, to increase its return, the commercial bank should invest it more funds on share and debenture (i.e. risky assets).
- Investment portfolio of commercial banks basically allocated funds into different sectors. So, it should be regularly revised from time to time and should maintain the equilibrium.
- The practice of creating a well-diversified portfolio can not be found in Nepalese financial market. The investment risk can be significantly reduced with a well-diversified portfolio. Hence, it is suggested to diversify their investment in different securities that behave differently i.e. with negative or low correlation for reducing poor portfolio performance.
- HBL should increase the return to its shareholders by identifying the new profitable investment sectors with diversifying the total deposit funds into sound and efficient portfolios.
- Similarly looking at the investment portfolio except NIBL, HBL, NABIL and BOK are focusing on Govt. Securities for their investment because government policy and regulation framework of the central banks. Therefore, investment on Govt. Securities should be decreased and investment on other sectors should be explored.

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ANNEX – 1

BOK

Year (Ending mid July)	2002/03	2003/04	2004/05	2005/06	2006/07
Paid-up Price Per Share (Rs.)	100	100	100	100	100
Closing Market Price Per Share (Rs.)	198	295	430	850	1375
Earnings Per Share (EPS) (Rs.)	17.72	27.50	30.10	43.67	43.50
Dividend Per Share (Rs.)	10	10	10	10	10
Dividend as % of Par Value	10%	10%	10%	10%	10%
Bonus Share/Stock Dividend	0	0	0	30	0
Price-Earnings Ratios (Times)	11.18	7.20	14.29	19.46	31.61

HBL

Year (Ending mid July)	2002/03	2003/04	2004/05	2005/06	2006/07
Paid-up Price Per Share (Rs.)	100	100	100	100	100
Closing Market Price Per Share (Rs.)	836	840	920	1100	1740
Earnings Per Share (EPS) (Rs.)	49.45	49.05	47.91	59.24	60.66
Dividend Per Share (Rs.)	1.32	0	11.58	30	15
Dividend as % of Par Value	1.32%	0	11.58%	30%	15%
Bonus Share/Stock Dividend	23.68	20	20	5	25
Price-Earnings Ratios (Times)	16.91	17.21	19.20	18.57	28.69

NABIL

Year (Ending mid July)	2002/03	2003/04	2004/05	2005/06	2006/07
Paid-up Price Per Share (Rs.)	100	100	100	100	100
Closing Market Price Per Share (Rs.)	740	1000	1505	2240	5050
Earnings Per Share (EPS) (Rs.)	84.66	92.61	105.49	129.21	137.08
Dividend Per Share (Rs.)	50	65	70	85	100
Dividend as % of Par Value	50%	65%	70%	85%	100%
Bonus Share/Stock Dividend	0	0	0	0	40
Price-Earnings Ratios (Times)	8.74	10.80	14.27	17.34	36.84

NIBL

Year (Ending mid July)	2002/03	2003/04	2004/05	2005/06	2006/07
Paid-up Price Per Share (Rs.)	100	100	100	100	100
Closing Market Price Per Share (Rs.)	795	940	800	1260	1729
Earnings Per Share (EPS) (Rs.)	39.56	51.70	39.50	59.35	62.57
Dividend Per Share (Rs.)	20	15	12.50	35.46	25
Dividend as % of Par Value	20%	15%	12.50%	35.46%	25%
Bonus Share/Stock Dividend	0	0	0	20	5
Price-Earnings Ratios (Times)	20.10	18.18	20.25	21.23	27.63

ANNEX – 2

Average Rate of Return, Variance & Standard Deviation of Market Returns

Overall Market Index

Year	NEPSE Index	Annual Return (R _m)	R _m - \bar{R}_m	$\sum (R_m - \bar{R}_m)^2$
2001/02	227.54			
2002/03	204.86	-9.97%	-37.83%	1431.11
2003/04	222.04	8.39%	-19.47%	379.08
2004/05	286.67	29.11%	1.25%	1.56
2005/06	386.83	34.94%	7.08%	50.13
2006/07	683.95	76.81%	48.95%	2396.10
		R _m = 139.28%		$\sum (R_m - \bar{R}_m)^2$ X 4257.98%

$$R_m = \frac{NI_{t+1} - NI_t}{NI_t} \quad \text{Where, } NI_{t+1} = \text{NEPSE Index at Year } t+1 \text{ and } NI_t = \text{NEPSE Index at Year } t.$$

$$\text{Average market return } (\bar{R}_m) = \frac{R_m}{N} = \frac{139.28}{5} = 27.86 \%$$

$$\text{Variance of Market Return } \text{Var } \sum (R_m - \bar{R}_m)^2 = \frac{\sum (R_m - \bar{R}_m)^2}{N - 1} = \frac{4257.98}{5 - 1} = 1064.50\%$$

$$\sigma_m = \sqrt{\text{Var } \sum (R_m - \bar{R}_m)^2} = \sqrt{1064.50} = 32.63\%$$

ANNEX – 3

Computation of Average Treasury Bills Rate (Risk Free Rate, R_f)

Fiscal Year	Risk Free Rate (R_f)
2002/03	3.48%
2003/04	2.93%
2004/05	4.32%
2005/06	2.79%
2006/07	3.98%
Total	17.5
Average	3.50

Source: Banking and Statistics Division, Nepal Rastra Bank.

ANNEX – 4

Calculation of Co-Variance Between Market Return and Rate of Return of BOK

Year	R_i	R_m	$R_i - E(R_i)$	$R_m - E(R_m)$	$\{R_i - E(R_i)\} \{R_m - E(R_m)\}$
2002/03	-18.11	-9.97%	-86.9	-37.83	3287.43
2003/04	54.04	8.39%	-14.75	-19.47	287.18
2004/05	49.15	29.11%	-19.64	1.25	-24.55
2005/06	195.93	34.94%	127.14	7.08	900.15
2006/07	62.94	76.81%	-5.85	48.95	-286.36
Total	343.95				4163.85
Mean	68.79				832.77

Beta Coefficient = $832.77/4870.7 = 0.17$

Calculation of Co-Variance Between Market Return and Rate of Return of HBL

Year	R_i	R_m	$R_i - E(R_i)$	$R_m - E(R_m)$	$\{R_i - E(R_i)\} \{R_m - E(R_m)\}$
2002/03	3.62	-9.97%	-35.29	-37.83	1335.02
2003/04	22.48	8.39%	-16.43	-19.47	319.89
2004/05	37.09	29.11%	-1.82	1.25	-2.28
2005/06	32.28	34.94%	-6.63	7.08	-46.94
2006/07	99.09	76.81%	60.18	48.95	2945.81
Total	194.56				4551.51
Mean	38.91				910.30

Calculation of Co-Variance Between Market Return and Rate of Return of NABIL

Year	R_i	R_m	$R_i - E(R_i)$	$R_m - E(R_m)$	$\{R_i - E(R_i)\} \{R_m - E(R_m)\}$
2002/03	12.86	-9.97%	-64.91	-37.83	2455.55
2003/04	43.92	8.39%	-33.85	-19.47	659.06
2004/05	57.50	29.11%	-20.27	1.25	-25.34
2005/06	54.48	34.94%	-23.29	7.08	-164.89
2006/07	220.09	76.81%	142.32	48.95	6966.56
Total	388.85				9890.94
Mean	77.77				1978.19

**Calculation of Co-Variance Between Market Return and Rate of Return of
NIBL**

Year	R_j	R_m	$R_j - E(R_j)$	$R_m - E(R_m)$	$\{R_j - E(R_j)\} \{R_m - E(R_m)\}$
2002/03	7.24	-9.97%	-25.77	-37.83	974.88
2003/04	20.13	8.39%	-12.88	-19.47	250.77
2004/05	-13.56	29.11%	-46.57	1.25	-58.21
2005/06	105.18	34.94%	72.17	7.08	510.96
2006/07	46.07	76.81%	13.06	48.95	639.29
Total	165.06				2317.69
Mean	33.01				463.54

ANNEX - 5

Calculation of Co-Variance Between BOK and HBL

Year	R _{BOK}	R _{HBL}	R _{BOK} - E(R _{BOK})	R _{HBL} -E(R _{HBL})	{R _{BOK} -E(R _{BOK})}{R _{HBL} -E(R _{HBL})}
2002/03	-18.11	3.62	-86.9	-35.29	3066.70
2003/04	54.04	22.48	-14.75	-16.43	242.34
2004/05	49.15	37.09	-19.64	-1.82	35.74
2005/06	195.93	32.28	127.14	-6.63	-842.94
2006/07	62.94	99.09	-5.85	60.18	-352.05
Total	343.95	194.56			2149.80
Mean	68.79	38.91			429.96

Calculation of Co-Variance Between BOK and NABIL

Year	R _{BOK}	R _{NABIL}	R _{BOK} - E(R _{BOK})	R _{NABIL} -E(R _{NABIL})	{R _{BOK} -E(R _{BOK})}{R _{NABIL} -E(R _{NABIL})}
2002/03	-18.11	12.86	-86.9	-64.91	5640.68
2003/04	54.04	43.92	-14.75	-33.85	499.29
2004/05	49.15	57.50	-19.64	-20.27	398.10
2005/06	195.93	54.48	127.14	-23.29	-2961.09
2006/07	62.94	220.09	-5.85	142.32	-832.57
Total	343.95	388.85			2744.41
Mean	68.79	77.77			548.88

Calculation of Co-Variance Between BOK and NIBL

Year	R _{BOK}	R _{NIBL}	R _{BOK} - E(R _{BOK})	R _{NIBL} -E(R _{NIBL})	{R _{BOK} -E(R _{BOK})}{R _{NIBL} -E(R _{NIBL})}
2002/03	-18.11	7.24	-86.9	-25.77	2239.41
2003/04	54.04	20.13	-14.75	-12.88	189.98
2004/05	49.15	-13.56	-19.64	-46.57	914.63
2005/06	195.93	105.18	127.14	72.17	9175.69
2006/07	62.94	46.07	-5.85	13.06	-76.40
Total	343.95	165.06			12443.32
Mean	68.79	33.01			2488.66

Calculation of Co-Variance Between HBL and NABIL

Year	R_{HBL}	R_{NABIL}	$R_{HBL} - E(R_{HBL})$	$R_{NABIL} - E(R_{NABIL})$	$\{R_{HBL} - E(R_{HBL})\}\{R_{NABIL} - E(R_{NABIL})\}$
2002/03	3.62	12.86	-35.29	-64.91	2290.67
2003/04	22.48	43.92	-16.43	-33.85	556.16
2004/05	37.09	57.50	-1.82	-20.27	36.89
2005/06	32.28	54.48	-6.63	-23.29	154.41
2006/07	99.09	220.09	60.18	142.32	8564.82
Total	194.56	388.85			11602.95
Mean	38.91	77.77			2320.59

Calculation of Co-Variance Between HBL and NIBL

Year	R_{HBL}	R_{NIBL}	$R_{HBL} - E(R_{HBL})$	$R_{NIBL} - E(R_{NIBL})$	$\{R_{HBL} - E(R_{HBL})\}\{R_{NIBL} - E(R_{NIBL})\}$
2002/03	3.62	7.24	-35.29	-25.77	909.42
2003/04	22.48	20.13	-16.43	-12.88	211.62
2004/05	37.09	-13.56	-1.82	-46.57	84.76
2005/06	32.28	105.18	-6.63	72.17	-478.49
2006/07	99.09	46.07	60.18	13.06	785.95
Total	194.56	165.06			1513.26
Mean	38.91	33.01			302.65

Calculation of Co-Variance Between NABIL and NIBL

Year	R_{NABIL}	R_{NIBL}	$R_{NABIL} - E(R_{NABIL})$	$R_{NIBL} - E(R_{NIBL})$	$\{R_{NABIL} - E(R_{NABIL})\}\{R_{NIBL} - E(R_{NIBL})\}$
2002/03	12.86	7.24	-64.91	-25.77	1672.73
2003/04	43.92	20.13	-33.85	-12.88	435.99
2004/05	57.50	-13.56	-20.27	-46.57	943.97
2005/06	54.48	105.18	-23.29	72.17	-1680.84
2006/07	220.09	46.07	142.32	13.06	1858.70
Total	388.85	165.06			3230.55
Mean	77.77	33.01			646.11

ANNEX – 6

Calculation of Weight (Amount) Invested in Government Securities (Risk Free Assets) and Invested in Share & Debenture (Risky Assets) of BOK

(In Million)

Years	Amount Invested in Government Securities	Amount Invested in Share & Debenture	Total Investment
2002/03	1510.71	305.44	1816.15
2003/04	2371.78	105.63	2477.41
2004/05	2146.62	451.63	2598.25
2005/06	2658.37	716.34	3374.71
2006/07	2332.04	660.39	2992.43
Total	11019.52	2239.43	13258.95
Weight	83.11%	16.89%	100.00%

$$\begin{aligned}
 \text{Portfolio Return } (R_p) &= W_m R_m + W_{rf} R_{rf} \\
 &= 0.8311 | 27.86\% + 0.1689 | 3.50\% \\
 &= 23.15\% + 0.59\% \\
 &= 23.74\%
 \end{aligned}$$

$$\begin{aligned}
 \text{Portfolio Risk } (\uparrow_p) &= W_m \uparrow_m \\
 &= 0.8311 | 32.63\% \\
 &= 27.12\%
 \end{aligned}$$

Calculation of Weight (Amount) Invested in Government Securities (Risk Free Assets) and Invested in Share & Debenture (Risky Assets) of HBL

(In Million)

Years	Amount Invested in Government Securities	Amount Invested in Share & Debenture	Total Investment
2002/03	39.80	34.3	74.1
2003/04	2781.7	96.6	2878.3
2004/05	5469.7	39.9	5509.6
2005/06	5144.32	5744.71	10889.03
2006/07	6454.87	5368.11	11822.98
Total	19890.39	11283.62	31174.01
Weight	63.80%	36.20%	100.00%

$$\begin{aligned}
 \text{Portfolio Return } (R_p) &= W_m R_m + W_{rf} R_f \\
 &= 0.638 | 27.86\% + 0.3620 | 3.50\% \\
 &= 17.77\% + 1.27\% \\
 &= 19.04\%
 \end{aligned}$$

$$\begin{aligned}
 \text{Portfolio Risk } (\uparrow_p) &= W_m \uparrow_m \\
 &= 0.638 | 32.63\% \\
 &= 20.82\%
 \end{aligned}$$

Calculation of Weight (Amount) Invested in Government Securities (Risk Free Assets) and Invested in Share & Debenture (Risky Assets) of NABIL

(In Million)

Years	Amount Invested in Government Securities	Amount Invested in Share & Debenture	Total Investment
2002/03	3588.77	2442.41	6031.18
2003/04	3672.63	2163.32	5835.95
2004/05	2413.94	1853.29	4267.23
2005/06	2301.46	3877.07	6178.53
2006/07	4808.35	4136.96	8945.31
Total	16785.15	14473.05	31258.20
Weight	53.70%	46.30%	100.00%

$$\begin{aligned}
 \text{Portfolio Return } (R_p) &= W_m R_m + W_{rf} R_f \\
 &= 0.537 | 27.86\% + 0.463 | 3.50\% \\
 &= 14.96\% + 1.62\% \\
 &= 16.58\%
 \end{aligned}$$

$$\begin{aligned}
 \text{Portfolio Risk } (\uparrow_p) &= W_m \uparrow_m \\
 &= 0.537 | 32.63\% \\
 &= 17.52\%
 \end{aligned}$$

Calculation of Weight (Amount) Invested in Government Securities (Risk Free Assets) and Invested in Share & Debenture (Risky Assets) of NIBL

(In Million)

Years	Amount Invested in Government Securities	Amount Invested in Share & Debenture	Total Investment
2002/03	400.00	1305.24	1705.24
2003/04	2001.10	1861.38	3862.48
2004/05	1948.50	1985.69	3934.19
2005/06	2522.30	3080.57	5602.87
2006/07	3256.40	3249.28	6505.68
Total	10128.30	11482.16	21610.46
Weight	46.87%	53.13%	100.00%

$$\begin{aligned}
 \text{Portfolio Return (R}_p) &= W_m R_m + W_{rf} R_f \\
 &= 0.4687 | 27.86\% + 0.5313 | 3.50\% \\
 &= 13.06\% + 1.86\% \\
 &= 14.92\%
 \end{aligned}$$

$$\begin{aligned}
 \text{Portfolio Risk (}\dagger_p) &= W_m \dagger_m \\
 &= 0.4687 | 32.63\% \\
 &= 15.29\%
 \end{aligned}$$