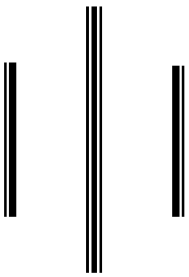
PORTFOLIO MANAGEMENT OF NEPALESE COMMERCIAL BANKS

(WITH REFERENCE TO BOK, HBL, NABIL AND NEPAL INVESTMENT BANK LTD.)



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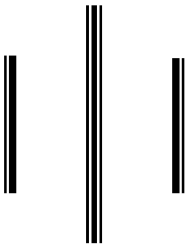

A Thesis Submitted to

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In partial fulfillment of the requirements for the degree of

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RECOMMENDATIONS

This is to certify that the thesis

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(WITH REFERENCE TO BOK, HBL, NABIL AND NEPAL INVESTMENT BANK LTD.)

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

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VIVA- VOCE SHEET

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

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and found the thesis to be the original work of the student written according to the prescribed format. We recommend the thesis to be accepted as partial fulfillment of the requirement for Master of Business Studies (MBS)

VIVA-VOCE COMMITTEE

Chairman of Research Department ……..

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Member (External Expert)…….

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DECLARATION

I hereby declare that the work reported in this thesis entitled **Portfolio Management of Nepalese Commercial Banks** (With Reference to BOK HBL, NABIL and Nepal Investment Bank Ltd.) submitted to Office of Dean, Faculty of Management, Tribhuvan University is my original work done in the form of partial fulfillment of the requirement of Master's Degree in Business Studies (M.B.S.) under the guidance and supervision of Mr. Mukesh Kumar Gupta of Mahendra Multiple Campus, Nepalgunj. Hence, the sole responsibility would be remained on me regarding this thesis for any positive or negative implication if emerged in future.

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I express my deep thanks Sabin Luitel of New Lumbini Pustak Pasal, Nepalgunj who helped to provide computer typing properly and timely.

December, 2011 **Amar Prasad Regmi**
Nepalgunj

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LIST OF ACRONYMS

AD	=	Anno Domine
AGM	=	Annual General Meeting
APT	=	Arbitrage Pricing Theory
ATM	=	Automated Teller Machine
BOK	=	Bank of Kathnandu
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	=	Hialayan 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
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 date information. The utilization of resources results in appreciation of the wealth of individual and the nation.

As an outcome of, the economic liberalization policy, Government of Nepal has put its face in the international arena by which so many investment opportunities are evolved within the nation integrated and specially development of the nation is possible, only when competitive banking services reach the nook send 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, commercial in view of 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 in different places some of the commercial banks are as follows:

- Nabil Bank Limited.
- Himalayan Bank Limited.
- Nepal Bank Limited.
- Nepal Bangladesh Bank Limited.
- Standard Charted 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 advise etc to their customers.

FUNCTIONS OF THE COMMERCIAL BANK

There are many functions of commercial bank. 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 of 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 Exchange

      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 financial 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 100 million and paid up capital of Rs 25 million

List of Class A Licensed Financial Institutions (Commercial Banks)
Mid July 2010

S.No.	Names	Operation Date (A.D.)	Head Office
1	Nepal Bank Limited	1937/11/15	Dharmapath,Kathmandu
2	Rastriya Banijya Bank	1966/01/23	Singhdarbarplaza,Kathmandu
3	Nabil Bank Limited	1984/07/16	Kantipath, Kathmandu
4	Nepal Investment Bank Limited	1986/02/27	Durbar Marg, Kathmandu
5	Standard Chartered Bank Nepal Limited	1987/01/30	Naya Bsneshwor, Kathmandu
6	Himalayan Bank Limited	1993/01/18	Thamel, Kathmandu
7	Nepal SBI Bank Limited	1993/07/07	Hattisar, Kathmandu
8	Nepal Bangladesh Bank Limited	1993/06/05	Naya Baneshwor,Kathmandu
9	Everest Bank Limited	1994/10/18	Lazimpat, Kathmandu
10	Bank of Kathmandu Limited	1995/03/12	Kamaladi, Kathmandu
11	Nepal Credit and Commerce Bank Limited	1996/10/14	Siddharthanagar, Rupendehi
12	Lumbini Bank Limited	1998/07/17	Narayangadh, Chitawan
13	Nepal Industrial & Commercial Bank Limited	1998/07/21	Biaratnagar,Morang
14	Machhapuchhre Bank Limited	2000/10/03	Prithvichowk, Kaski
15	Kumari Bank Limited	2001/04/03	Durbarmarg, Kathmandu
16	Laxmi Bank Limited	2002/04/03	Adarshanagar, Parsa
17	Siddhartha Bank Limited	2002/12/24	Hattisar, Kathmandu
18	Agriculture Development Bank Limited	1968/01/02	Ramshahapath, Kathmandu
19	Global Bank Limited	2007/01/02	Birgunj, Parsa
20	Citizens Bank International Limited	2007/6/21	Kamaladi, Kathmandu
21	Prime Commercial Bank Limited	2007/9/24	New Road, Kathmandu
22	Sunrise Bank Limited	2007/10/12	Gairidhara Crossing, Kathmandu
23	Bank of Asia Nepal Limited	2007/10/12	Tripureswor, Kathmandu
24	Development Credit Bank Limited	2008/05/25	Kamaladi, Kathmandu
25	NMB Bank Limited	2008/06/05	Babarmahal, Kathmandu
26	KIST Bank Limited	2009/05/07	Anam Nagar, Kathmandu
27	Janata Bank Nepal Limited	2010/05/04	Naya Baneshwar,Kathmandu

(Source: Banking and Financial Statistics, Mid July 2010, Nepal Rastra Bank.)

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 there 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.

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.

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 Techincal 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)

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

1.2 Focus of the Study

The investment decision is one of the major functions on 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 savers to users?
- 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.?
- 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 main objective of this study is to identify the situation of portfolio management of Nepalese commercial banks. The specific objectives of the study are as follows.

- 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 Limitations of the Study

In the context of Nepal, data collection is major problem for study. 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 Commercial Bank's, the study focuses only on four Commercial Bank's namely, BOK, NABIL, HBL and NIBL.
- The study covers the period of five years only i.e. from FY 2005/06 to 2009/10.
- The study is based on secondary data and therefore, the findings are based on the information provided by the banks.
- The time factor is major limitation of this study because this study is completed within a short span of time.

1.6 Organization of the Study

The study has been organized into five chapters. They are as follows.

Chapter I: Introduction

In the first chapter, introduction part of the study. It has introduction of commercial bank as well as the introduction of sleeted banks Bank of Kathmandu, Himalayan Bank Limited, Nabil Bank Limited, Nepal Investment Bank Limited, General background of the study, Function of the commercial bank, Development of commercial banks in Nepal, Focus of the study, statement of the problems, Objectives of the study, Limitation of the study, Organization of the study are arranged.

Chapter II: Review of Literature

The second chapter deals with review of literature. It includes conceptual review, portfolio return and risk, investment process, investment alternatives, systematic and unsystematic risk. It also reviews the major relevant studies like books, articles, thesis with portfolio management of Nepalese commercial banks.

Chapter III: Research Methodology

The third chapter explains the research methodology use to evaluate portfolio management of Nepalese commercial banks. It consists of research design, population and samples, sources, techniques, tools of analysis.

Chapter IV: Presentation & Analysis of Data

The fourth chapter deals with presentation and analysis of data through a definite course of research methodology. This chapter is to analysis different financial ratios and statistical analysis related to portfolio analysis of this sample bank.

Chapter V: Summary, to Conclusion & Recommendation

The fifth chapter discuss summary of the study, conclusion and suggestion as well as recommendations. Besides this chapter bibliography is also included.

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. This chapter also gives the conceptual framework on common stock, return of common stock, holding period return, required rate of return, expected rate of return, risk on common stock, range, standard deviation, coefficient of variation, portfolio, systematic risk and unsystematic risk etc. Literature review means reviewing research studies and other pertinent prepositions in the related areas of study so that all the past studies, their conclusions and further research takes place. It is a vital and mandatory process on research works. During the review of research, in depth-study and theoretical investigation regarding portfolio's aspects and their present application and potentialities made. Simply the term portfolio implies combination of securities for investment with objective of reducing risk. This research will deal the security market and availability of opportunity for investment.

The term investment can be defined as employing the fund out of our saving to have some return in the future. In other words investment is the sacrifice of current consumption to have the better consumption in future. Two different attributes are generally involved in investment, they are time and risk.

2.1 Conceptual Review

A portfolio is a bundle of combination of individual assets or securities (*Pandey, 1997:329*). 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 than a weighted average of variance. As a result an

investor can something 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 & Brigham, 1982:123*). 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 pars 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 & Copeland,1996:357-623).*

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 & Moses, 1992: 5-54,647-707*). The theory is concerned with selection of an optimal portfolio by a risk avers 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 weighs are equal securities (the weight must sum to hundred percent or one) the general formula for expected return of a portfolio, Rp is as follows.

$$\mathbf{Rp} = \sum \boldsymbol{W_J R_J}$$

Where,

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

R_J = Expected return for security j

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

$$\mathbf{R_p = W_A R_A + W_B R_B}$$

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 ,

$$\sigma_p = \sqrt{\pm_p^2} = \sqrt{(w_j.\sigma_j)^2 + (w_k.\sigma_k)^2 + 2.w_j.w_k.\ Cov_{jk}}$$

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.

COV_{jk} = pjk σp σk

where,

pjk = The correlation coefficient between possible return for security j and k

σj = S.D. of security j

σk = 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 the returns from two securities generally moves in the same direction and zero correlation coefficient shows that he returns from two securities are uncorrelated. They show no tendency to very together in either a positive or negative in 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. Investment 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 spend 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 return for bearing one more level of risk. People always try 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;1970:112)

"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 & Bailey;2003:512).

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 in the 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 is understood as 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:

To select the security first of all set investment policy then, analyzing the available security. The security can be analysis in two ways are as follows:

i) Technical Analysis:

When security market price is analyzed and investment decision is taken 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 revise 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 No. 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		
Valuation Of Stocks	Valuation Of Bonds	Valuation of Assets
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: Keith V. Smith and David K Eiteman, Essential Of Investment, (Hollywood III, Richard D, Irwin Inc,1974)]

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 that 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 minimum Rs. 50 and multiple of Rs. 10. 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 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 no 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 return are based on probabilities and theoretical data.

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 associate 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 maximum 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. Risk can be diversify and minimize 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 discuss 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 loss. Diversification is the main important step to reaching your long-range financial goals minimizing risk which 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 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 that product against volatility and uncertainty at rate of risk and 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 on diversifiable 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.

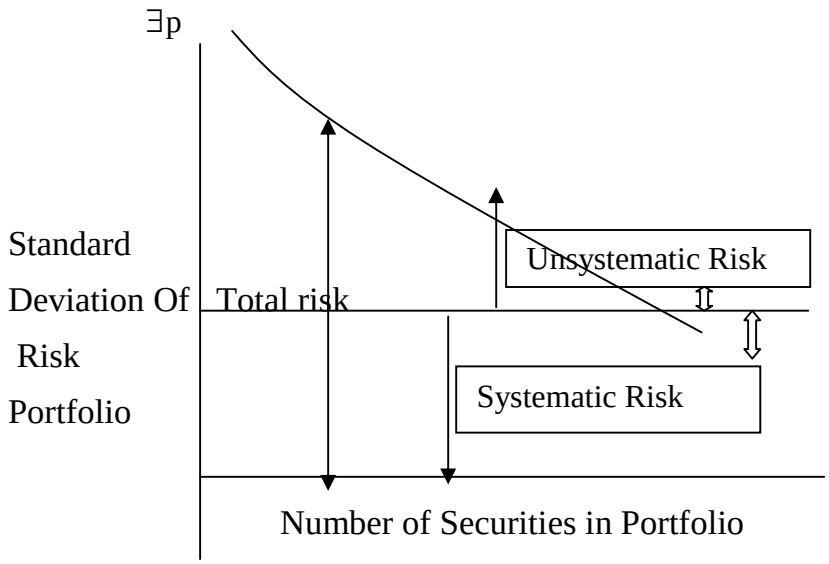
2.1.7 Systematic and Unsystematic Risk

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 risk lies 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 error ices, inventories, advertising, campaigns, shifts in consumer taste and lawsuits cause unsystematic variability in the value of market assets.

Figure 2.1The 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 extent they affect the security's risk and return. The CAPM graphically represents the trade –off of systematic risk for returns that investors expect are 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:

$$Kj = Rf+[E(Rm)-Rf]\beta j$$

Where,

Kj = Required rate of return on stock j

Rf = Risk free rate of return

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

Bj = Beta Coefficient Of stock j

The CAPM has some assumptions. (Sharpe, Gordon, 2003, 6th Edition)

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: -

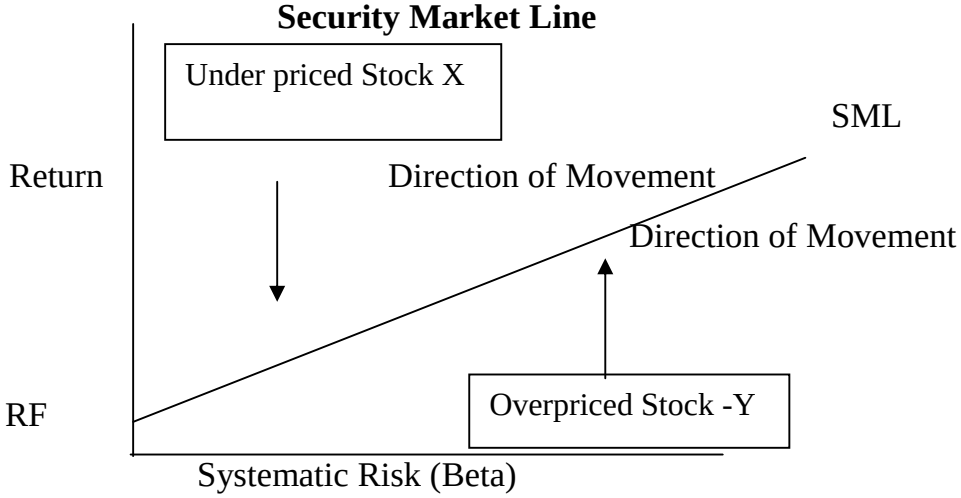
Beta is the measure of percentage change in security return as a result of one percentage change in excess market return .It tells in how much

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

Figure 2.2
Security Market Line



(Sources: Van Horne & Wachowicz,p-107)

In above diagram fig 2.2. 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.

2.2 Review of Books

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 to thumb and instuitive judgement (Markowitz; 1952:77).

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 Gorden, et.al, 2000:194).

Assumptions of Markowitz's Portfolio Selection Model

The portfolio selection model developed by Markowitz this model is based on the several assumptions regarding investor behavior (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 passer 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; 1982:260).

The portfolio expected return is defined in equation as follows:

$$\mathbf{R_P=W_AR_A+W_BR_B+.....+W_NR_N}$$

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

Rj=R

Thus, the Arbitrage Pricing Theory logic is not much different from the logic used in 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 systematic risk of each factor is determined as the market price per unit of risk (i.e. the excess, of the expected value of the factor under consideration over the risk free rate i.e. [E (Fk)-RF] multiplied by the degree of factor's systematic risk (i.e. the sensitivity of security j to k^{th} factor, b^{jk})
In another words; $r_p = b_{jk}[E(F_k) - R_p)$ (Ross ;1976:341-360)

The Jack E. Gaumnitz's Study

Several articles has been written concurring the appraisal and performance of investment portfolio many of there studies compare portfolio returns over time only and while recognizing the importance of variability of risk to a portfolio, no explicit determining is made of this latter component.

Jack E. Gaumnitz, Assistant Professor University of Kansas fulfilled this gap in his research work entitled "Appraising performance on investment portfolios" (*Gaumnitz: 1970:555-560*). The main purpose of his study were to present evidence on the portfolio return as the sole criterion in measuring portfolio performance in lieu of theoretically correct return variability of return measure and to examine portfolio strategy given the results to maximizing return or minimizing variability in order to maximize stockholder utility.
To support his study he used capital market line.

$$E(R_P) = r^* + \frac{r - r^*}{\sigma_r} \sigma_{RP}$$

OR

$$R_p = r^* + \beta \sigma_{RP}$$

Where,

E (Rp) = The overall rate of return on the investor's portfolio with standard deviation of σ_{RP}.

r* = The risk less rate of return.

r = Return on the portfolio with a standard deviational of σ_r.

$\beta = \frac{r - r^*}{\sigma_r}$ (Market price of risk)

In this model, it was clear that the portfolio with highest β value will be one that allows the invertors to attain his highest indifference curve through borrowing or lending at the risk less rate. Thus, the investor wants to select that mutual fund or other portfolio that maximizes β. Since $\beta = \frac{r - r^*}{\sigma_r}$, β can be maximize either by minimizing σ_r or by trying to maximize the return r.

To test relationships between β, r and σ_r. He has selected several investment portfolios. He had used 100 portfolios for the year 1960-63 and 51 portfolios for the year 1964-65 included 59 mutual funds, 45 random portfolios, 45 cluster portfolios and 2 standard and poor.

From the study he concluded that

- The mean return on a portfolio used as a good portfolio performance can be used as a good proxy for the theoretically correct β value, which in incorporates both the return and the variability of return measures.
- Portfolio managers will generally have the greatest success in maximizing the portfolio's β value if they attempt to maximize that portfolio's return rather

than try to minimize its risk. That means investment in the stock with high expected return than stable income. This is, due to the return measures dominated the risk measures in the calculation of ¯ value.

2.3 Review From Articles

The article in the web page www.investopedia.com **"Are you over diversified"** mentioned that many individual investor 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.

The Article **"Selection of Portfolio"** in web page www.indiainfoline.com by Prof. Dr. Vijay Pal Chatarjee 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 mauled 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.

An article published on the Kathmandu Post Daily on 28th April 2004 on entitled **"Effective Banking" by L.D. Mahat,** explained that the efficient of banks could be measured using different parameters. The concept of productivity and profitability can be applies 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, if 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 upon. This may also help the inefficient bank to upgrade their efficiency and be wire 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.

An article entitled **"International Portfolio Investment Flows" by Michael. J. Brennam and Hennery Cao** developed a model of international equity portfolio investment flows based in difference in informational endowment between foreign and domestic investors. It is shown that when domestic investor's posses a cumulative information advantages over foreign investor about their domestic market investor tends to purchase foreign assets in period, when the return on foreign assets is high and to sell when the return is low. The article has concluded that if foreign and domestic investors are differently informed then portfolio flows between two continue

will be linear function of the contemporaneous return in all national market indices, and if domestic investors about domestic securities, the coefficient of the most market return will be positive. It had developed a model of international equity portfolio flows that relies on informational difference between foreign and domestic investors. The examination of US portfolio investment in emerging market has shown the strong evidence that US purchase are positively associate with the local market return in many countries.

Diversification is the important component in helping you reaches your long-range financial goal while minimizing your risk. At the same time, diversification is not an ironclad guarantee against loss. No matter how much diversification you employ, investing involves taking on same sort of risk.

Another question frequently baffles investors. How many stocks should be brought in order to reach optimal diversification? According to portfolio theorists, after around 20 securities, you have reduced almost all the individual security risk in a portfolio. This assumes you by stocks of different sizes from various industries.

It is well known that risk and return are the major things of analysis but there is so many factors to be consider while making investment. Imperfect knowledge and imperfect data creates more risk. Investors are not always risk averters. Some of the investors are risk lovers but they expect some considerations for bearing more risk. Acceptance of risk level is different in investors, so they are interested in various stocks, which have incompatible risk. Mr. Terrance Odeon mentioned risk loving nature of investor in the finance of journal Vol. 53 1998. He further mentioned that investor has unique risk bearing capacity and choice in investment varies accordingly to level of risk.

2.4 Review from Theses

There are some studies had been conducted as a thesis for the partial fulfillment of Master Degree of management faculty. Here some thesis is reviewed these are:-

Bhatta (1995), entitled "Assessment of the performance of listed companies in Nepal". The objective of the research was to analyze the performance of listed companies in the term of expected rate of return and companies specific risk, required rate of return, systematic risk and diversification of risk through portfolio concept. He took the periodic data of five years from 1987-1991 AD of the listed companies. His research methodology was descriptive and analytical. From the study Mr. Bhatta add versed the following findings from his analysis of different stocks.

"A highly significant positive co-relationship been addressed between risk and return character of the company. Investor expects highest return character of the company. Investor expects higher return from those stocks, which associate high risk. Nepalese capital market is not efficient one. So the stock price does not contain all the information relating to market and company. Itself does the member of the stock exchange try to disseminate the information. So, the market return and the risk both may not represent reality. The analysis shows some correlation had negative and some has positive one. Negative correlation between securities return is preferred for diversification of risk. Practice has changed in these 10 years. Market trend has changed from Bull market to bear market. Investor are being rational Financial work force is increasing market yearly. They are started applying their financial knowledge. Research was concentrated portfolio by minimum variance only in the investment alternatives are increased. Now equity shares are trading at NEPSE. Instability in politics and state affairs created change in the investor's portfolio selection and performance of alternatives.

After reviewed Bhatta's study it can be said that due to various limitations the study has not explored actual viewpoint of the investors. It is concentrated and the companies and stock market. However this study has explored some dimensions and it will be more fruitful to further researchers.

Sapkota (1999), entitled "Risk and Return Analysis in Common Stock Investment". The main objective of the study is to analyze the risk and return of the common stock in Nepalese stock market, the study focused on the common stock of commercial banks". In this study he found that the banking industry is the biggest one in term of

market capitalization and turnover. Expected rate of return in common stock of Nepal Bank Limited is maximum (66.99%) and CS of Nepal SBI Bank limited is found minimum. In this regard CS of NSB is least risky. In the context of industries, expected return of finance and insurance industries is found highest. Expected return of banking industry is 60.80%."

At the end of the study Mr. Sapkota has concluded, "common stock is the most risky security and life blood of stock market because of the higher expected return, CS attracts most investors. Private CS holders are the passive owners of the company. But the private investors play a vital role in economic development of the nation by mobilizing the dispersed capital remained different form in the society. As overall economy, Nepalese stock market is in emerging state. Its development is accelerating since the political change in 1990 in effect of openness and liberalization and poor knowledge. Nepalese investors cannot analyze the securities well as market properly". Mr. Sapkota has found some points and need recommendation to concerned party. He recommends following points to private investors, regulating government.
Private investors should try and work out their attitude towards the risk of various investments.

Investors need to diversify their investment to reduce risk. Proper construction of portfolio never takes any considerable loss. Government of Nepal needs to manage the trading of government securities in NEPSE, instead of NRB.As per changing scenario government need to amend rules and regulations and implementation those amendment regarding stock market.

Joshi (2002), conducted a research entitled "Investor Problem in Choice of Optimum Portfolio of Stock Exchange" with reference to various commercial banks financial companies and others. There are some of the objectives of this study. The main objective of this research is to analyze the trend of NEPSE and try to find out the portfolio of NEPSE to invest. This research also suggests the majors for the improvement of the stock market as well for better meet of investors. Mr. Joshi has

taken selected and short-listed a companies which are categorized in "grade A" in NEPSE as his sample size. From this he has find that SCBNL has the greater expected return i.e. Rs. 2358.85 and Necon Airlines the lowest expected return i.e. Rs.-3.34. Likewise, NBBL has the greater risk i.e. Rs 753.04 and the CIT has the lowest risk i.e. =Rs.4.08. Higher C.V. explains that the stocks are highly volatile and thus much risks. So as per lesser coefficient of variation PFC, NABIL & CIT are the best stock to invest whose coefficient of variation are 205%, 308% and 344.71% respectively. The correlation coefficient between PFC & NSBIBL is 0.07479 where as correlation coefficient between PFC & CIT is 0.17645. Both are positive but lower degree of positive correlation. It means when one increases another also increases and vice versa.

Khaniya (2003), entitled "Investment Portfolio Analysis of Joint Venture Banks". The main objective of the research was to analyze the portfolio investment of the listed joint venture banks:-NABIL, SCBNL, HBL, NBBL and EBL. In this research the researcher tries to analyze the risk and return of joint venture banks and the financial performance analysis. This research helps to provide the suggestive package based on the analysis of data. The major of the study is that the 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 mean return on shareholder's fund resulting from the negative return.

Shrestha (2004), research entitled to "Optimum Portfolio Investment in NEPSE". The objective of the research was to analyze the optimum portfolio investment in NEPSE. The main objective of the research was to analyze the performance of listed companies in the term of expected rate of return and company specific risk, required rate of return, systematic risk and diversification of risk and to find out the optimum portfolio through portfolio concept. He takes the seven years data of seven commercial banks, finance companies, insurance companies, manufacturing companies and other company. From this the researcher concludes that NABIL is the best security for risk lover investor and NIBL is the best alternative for risk averter investor in banking securities. BOK is the most risky asset.

NCM is the most risky assets and YFC is the best security to risk averter investors in securities of finance companies. The best security in the insurance companies is EICL on the base of risk and return characteristics. Regarding the risk and risk of the manufacturing securities BNL is the best security. The risk and return of other securities are not satisfactory. Only BBCL is providing positive return, which is also lower than market. Market return of NEPSE index is 7% and standard deviation of market is 36.11%. The market rate of return is not satisfactory in comparison to its risk level. Among the selected securities, YFC is the best security having minimum coefficient of variation i.e. 0.9910 with the return of 31% and risk of 30.72%. According to the researcher investor selected securities on the basis of fundamental analysis rather than technical analysis. Investors are risk lovers

Neupane (2005), made a research entitled "Determinants of Stock Price in NEPSE" and tried to explore the factors that have significant influence on the stock price in NEPSE. He concluded his study by quoting;

Nepalese investors have not adequate education about the capital market. They do not have good knowledge and information to analyze the scenario and to forecast share price. Perhaps due to this reason stock price in NEPSE rather shows irrational behavior.

In NEPSE, DPS, BPS & EPS individually do not have constituent relationship with the market price of the share among the listed companies. The pricing behavior varies from one company to another. But EPS, BPS & DPS, jointly have significant effect in market price of the share. So, there may be other major factors affecting the share price significantly. NEPSE is in its primary stage, adopting open out cry system for stock trading and stockbrokers lack professionalism to create investing opportunities in NEPSE.

- Commercial banking sector has dominated the overall performance of NEPSE. Manufacturing & processing, trading and hotel sectors have weak performance. So, financial intermediaries are strong but their ultimate investment is suffering.

- Companies' performances (earning, dividend, book value, risk etc) information disclosed , timely AGM , political stability, national economy, demand & supply situation, strikes, demonstrations, ceasefire and peace talks (and their outbreak) are the major factors affecting the share price in NEPSE, according to the respondent of survey. Interest rate, retention ratio, cost of equity, tax rate, gold price , value of US $, global economy, market liquidity, season, day of the weak, size of the firm, change in the management do not significantly affect the price of the share in NEPSE.
- There is deficiency of proper laws and policies regarding the capital market. Shareholders are feeling unsecured to invest in security markets due to poor regulatory mechanism to protect shareholders interests. The implementation of existing laws is weak.
- Listed companies do not provide sufficient information (financial as well as non financial) to their shareholders and they are not able to act according to the shareholders' interests. The performance of most of the listed companies is not transparent.
- Since NEPSE is in increasing trend, in spite of unfavorable environment for investment, Nepalese citizens have a huge amount of scattered fund remained unproductive, which can be used in the industrial development through capital market to accelerate the economic growth of the nation.
- With the existing Maoist problem, industrial development and capital market development is impossible. So, the peaceful solution of the Maoist problem is preliminary condition for capital market and economic development in Nepal.

Phuyal (2006), has conducted research on "Stock Price Behavior of Selected Banking and Insurance Companies" is related with stock price behavior. He has tried to show the functional relationship of MPS with other financial indicators: DPS, EPS, NWPS and price appreciation along with the fundamental concept of stock market. He has attempted to show the behavior of chartists (Technicians) and fundamentalists in relation to projection of equity prices. To achieve the basic aim of this study, he set following objectives at the time of research.

- To identify the major financial indicators which affect on determining MPS.

- To examine and evaluate the relationship of MPS with various financial indicators like; EPS, NWPS, DPS and current years dividend.
- To identify whether stocks of the sampled companies are over priced, under-priced or equilibrium priced.
- To study the singling and informational effect on share price.
- To examine Nepalese investors' response on the change of stock.

To achieve the above objective, he has taken 5-year financial data of five leading commercial banks, three finance companies and two Insurance companies. He applied econometric model to show the relationship between the independent variables and their linear impact on MPS. Correlation coefficient and regression equations were calculated and derived to estimate future MPS. However, this study covered very few variables due to which the inferences drawn might lead to wrong conclusion. In research design, he explained, "To draw inferences on the market performance of stock market and price formation, different measures have been used, while collecting and interpreting relevant data, facts and figures with a view to systematic data collection and data's interpretation. Simple statistical tools have been used to finish this research works, which represent the explanatory and descriptive analysis of the relevant information and data." Nevertheless, this study tries to explore the determinants of equity price by way of showing the functional relationship between the equity price and financial indicators along with the fundamental knowledge of stock market in Nepalese context. The major findings of this study are given below:

- Nepalese investors have limited knowledge about security market. It lacks of professional investors.
- Most of the stocks of banking and finance companies are under valued in the stock market.
- Investors are trading the stocks without proper analysis of the financial indicators.
- The price fluctuating trend is not predictable by general investors.

- Signaling factors should be analyzed on regular basis by the concerned authority so that the future movements of price can be predicted from the side of analyst and investors.

Poudel(2006), Prepared the thesis entitled "An investment Portfolio Analysis of Joint Venture Banks in Nepal. The study is based only to the portfolio analysis between banking sector and other sector.

The main objective of this study is to identify the situation of portfolio management of commercial bank of Nepal and portfolio analysis between banking sector and other sector. The specific objective of the study are as follows:

- To examine risk and return of commercial banks.
- To analyze market sensitivity.
- To know about systematric, unsystematic risk and analyze them in portfolio construction process.
- To analyze portfolio return and risk.
- To evaluate financial performance of commercial banks of Nepal Under study.

Major Findings:

1. SCBL Stock has the highest expected return i.e. 20.486% and HBL has the lowest expected return i.e 3.48% NIBL and SBIBL stock have the expected return is 11.63%. The risk (S.D)of SBIBL is the highest i.e. 62.22% and SCBL has the lowest risk i.e. 33.10% . HBL and NIBL has a risk of 37.24% and 37%, respectively. The market risk (Market S.D) is 36.40%. So it shows that SCBL has higher the return lower level risk.
2. All the returns of commercial bank's are positively correlated with returns of market because all values are nearly equal to +1. SBIBL stocks return are the highest positively correlated and SCBL stocks returns are lease positively correlated with return of market. All banks has a beta less than 1 except SBIBL. SBIBL has highest beta i.e. 1.63 and SCBL has the lowest beta i.e.

0.77. So stock returns of SBIBL are more volatile and stock returns of SCBL is less volatile among four commercial banks.

3. Total risk of SBIBL stock is highest and total risk of SCBL stock is lowest among four banks. SBIBL stock has 91% of undiversifiable risk only 9% of its risk on total risk is diversifiable risk. HBL has 84.5% of undiversifiable risk and remaining 16.5% diversifable risk on total risk. NIBL and SCBL have an 85.5% and 72% of undiversifiable risk and 14.5% and 28% risk and div ersifiable risk respectively.
4. The required rate of return of SBIBL is the highest i.e 16.34% and SCBL stock is the lowest i.e. 9.9%. Other bank HBL and NIBL have a required rate of return of 11.18% and 11.18% respectively. SCBL stocks required rate of return is less than expected return, so the stocks price is under priced. But other banks stock required rate of return is greater than expected return so the stock price is one Priced.
5. NIBL has the highest portfolio return i.e. 8.2643 and it has the highest portfolio risk i.e. 20.03%. HBL has the lowest portfolio return i.e. 4.2447% and it has the lowest portfolio risk i.e. 0.4831%. SCBL and SBIBL has a portfolio return of 6.1683% and portfolio risk of 9.8134% and 0.6145% respectively.
6. The performance measure shows that the stock of NIBL is the highest i.e. 4.118, stock of HBL is lowest i.e. 0.0984. Sock of SCBL is second higher i.e. 0.2055 and stock of SBIBL is in third position among banks.

Gautam (2006), prepared the thesis entitled "Investment portfolio of commercial banks in Nepal." The study is based only on those factors, which are related with investment portfolio analysis, on secondary data published by and collected from selected banks and from the journals and unpublished articles and thesis, only five commercial banks are taken under study. The study covers a period of eight fiscal years which are tabulated and processed for drawing conclusion.

The main objective of the study is to identify the current situation of investment portfolio of commercial bank in Nepal. The specific objectives are as follows:-

- To emphasize the concept of investment and loans and advance portfolio.
- To assess the financial performance of commercial banks in term of investment approach.
- To analyze the risk and return ratio of commercial banks.
- To provide useful information based on the analysis of the data.

Major Findings:

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

Investment Portfolio: In investment portfolio, the industry average investment on government securities is 84.33%, among the CBS, EBL has invested the highest amount of funds on govt. Securities i.e. 98.58% and NIBL has invested lowest 55.84% other banks SCBL, NABIL and EBL have been investing highest amount of funds on share and debenture among CBS and EBL have invested lowest amount of funds on S and D. i.e. 1.42% NABIL and HBL have invested lower than industry average and the industry average in this case is 15.67% on which NIBL is invested higher than industry average i.e. 44.16%. In case of NRB bonds no one banks are investing. There is zero amount of investment.

Loan and Advances Portfolio: In loan and advances portfolio, the industry average investment on Govt. Enterprise is 2.28%, Among the CB's HBL has invested the highest amount of funds on Govt. enterprises i.e. 3.89% and EBL has invested lowest 1.08%, NIBL and NABIL are below the industry average i.e. 1.41%, and 1.36% respectively and HBL is higher the industry average of 3.89% EBL is investing highest amount of funds on Private sector among CBs i.e. 97.01% and NIBL has invested above the industry average on private sector i.e. 96.32%. And SCBL and HBL have invested lowest amount of funds on Private Sector i.e 93.70% and 94.17% respectively. NABIL is investing the highest amount of funds on for bill P and D as compared to other CBs i.e. 3.38%.

The industry average in this case is 2.44%. NIBL, EBL and HBL has invested lower than the industry average i.e. 2.27%, 1.91% and1.99% respectively but SCBL have invested above industry average i.e. 2.65%.

Portfolio Risk and Return on Investment: There is positive Correlation coefficient between return on investment made by CBs in Govt. Securities loan and advance i.e. 0.613. And there is low positive correlation coefficient between return on investment made by CBs in Govt. Securities and S & D and loan & advance and S & D i.e. 0.032 and 0.207 respectively. This shows the low degree of normal relationship between assets. Such assets are very useful to make portfolio combination, so that the risk of the portfolio will be significantly reduced.

According to the Calculation Portfolio Return is lesser than the individual return of S & D. and L & A but higher than individual return of Govt. Securities. And portfolio risk is less than the individual risk of L & A and Govt. securities but very lower risk than individual risk of S & D this is due to low correlation between assets which shows the portfolio reduce risk.

Risk and Return: The average return on Govt. Securities 4.57% and its coefficient of variation is 28% which is very low return among other investment but higher risk than L & A investment.

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 27 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 questionnaire 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 NSBO, 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,

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

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 if return that an investor expects. It is function of real rate of return and risk. The required rate of return is risk premium over the risk free return. It is determined CAPM.

Symbolically,

Required rate if return (R_j) = R_f + (R_m-R_f) β_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 expected rate of return. It assumed that history repeats itself. The future cash flow based on the historical cash flow. The expected return will be the average of historical rate of return. In term of holding period return, the expected rate of return for any specific securities is the expected rate of turn taken from its historical return.

Symbolically,

$$E(R_j) = \frac{\sum_{t=1}^{t} HPR_j}{n}$$

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,

Standard Deviation of Security j $(\pm j) = \sqrt{\frac{\phi f(Rj)\,Z E(Rj)Å}{n\,Z1}}$

Variance $(Var_j) = (\pm_j)^2$

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.

$$\text{Annual Market Return } (R_m) = \frac{\text{NEPSE Index at end of theYear-NEPSE Indecat beginning of the year}}{\text{NEPSE Indexat Beginning of the Year}}$$

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

Symbolically,

$$\text{Market Return } f\overline{R}_m A = \frac{R_m}{n}$$

Where,

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

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,

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

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

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,

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

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

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

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

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:

$$\pm p \, X \sqrt{\pm_1^{\,2} w_1^{\,2} \Gamma \pm_2^{\,2} w_2^{\,2} \Gamma 2 w_1 w_2 \, \mathrm{cov}_{12}}$$

Or,

$$\sqrt{\pm_1^{\,2} w_1^{\,2} \Gamma \pm_2^{\,2} w_2^{\,2} \Gamma 2 w_1 w_2 \circ_{12} \pm_1 \pm_2}$$

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

$$Var = (\pm)^2$$

Where,

- $\pm j$ 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,

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

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, . Therefore, beta is a key element of the CAPM; 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^2_m 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 high 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.
- 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.

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

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

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

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

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,

Unsystematic Risk = Total Risk – Systematic Risk

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

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

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

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

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,

$$S_p \; X \frac{R_p \; Z R_f}{\pm_p}$$

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,

$$(\pm j) = \sqrt{\frac{\phi f(Rj)\, Z E(Rj) Å}{n\, Z1}}$$

$$\text{Var} = \pm^{2}$$

Where,

- $\pm_j$ 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 know as the coefficient of standard deviation.

Symbolically,

$$Coefficient\, of\, Variation(CV)\, X \frac{S\tan dard\ Deviation(\pm j)}{Mean(\bar{x}j)}$$

Two distribution 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 zero. It computed as:

Symbolically,

$\text{Cov}\,(_{\text{j\&m}})\,\text{X}P_{j\&m}X\pm_{j}X\pm_{m}$

Correlation Coefficient

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

Symbolically,

$\circ_{j\&m}\,\text{X}\frac{Cov_{jm}}{\pm_{j}\pm_{m}}$

<u>Decision Parameter</u>

- 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.

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

Where,

EP = Ending Price or Closing Price of this Year

BP = Beginning Price or Closing Price of Previous Year

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

$$\overline{R_j} = \frac{R_j}{N}$$

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:

Standard Deviation ($\exists_j$) = $\sqrt{\frac{(R_j Z \overline{R_j})^2}{n Z 1}}$

Variance = $(\exists_j)^2$

Similarly, coefficient of variation of returns, C.V. (R_j) = $\frac{\pm_j}{\overline{R_j}}$ x 100%

Commercial Banks

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

Table 4.1
Average Rates of Return, Variance, SD and CV of Commercial Banks

Commercial Banks	$\overline{R_j}$	**Var (R_i)**	$\pm_r$	**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

Sources: Annual Report

The Table 4.1 depicts that the average or mean return of the BOK was 68.79% over the five years period starting from mid July 2005 to mid July 2010 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.

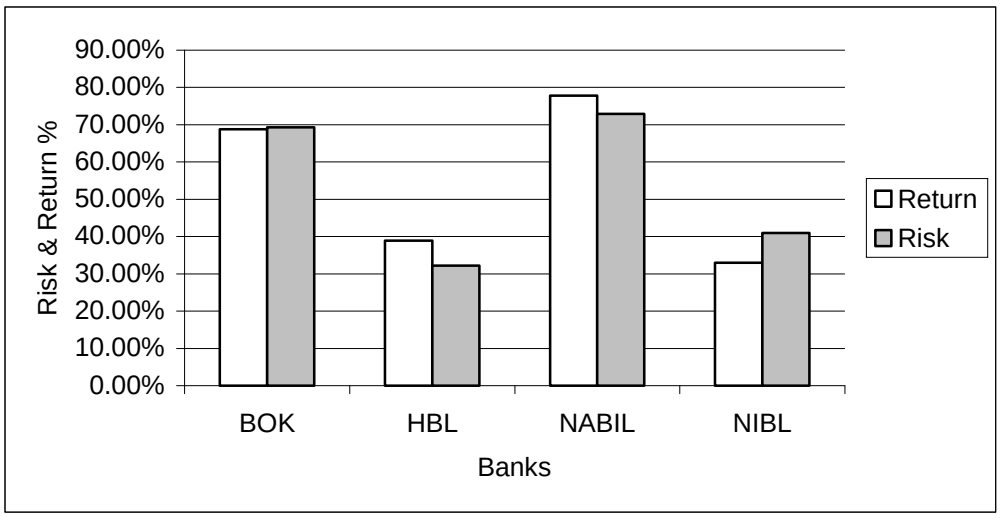
Similarly, the mean return for the HBL was obtained as 38.91% with variance of 1036.8 and standard deviation of returns of 32.20%. The coefficient of variation for the bank was calculated to be 84.51%.

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-variance. It measures the absolute association between two variables. Likewise, the correlation coefficient measures the relative association between tow 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.

Beta coefficient, $\beta_{im} = \frac{Cov(R_j, R_m)}{Var(R_m)}$

Cov $(R_j, R_m) = \frac{\sum (R_j - \bar{R}_j)(R_m - \bar{R}_m)}{N - 1}$

Var $(R_m) = \frac{\sum (R_m - \bar{R}_m)^2}{N - 1}$

Standard deviation, $\sigma_m = \sqrt{\frac{\sum (R_m - \bar{R}_m)^2}{N - 1}}$

Table 4.2
Covariance and Beta Coefficients of Commercial Banks

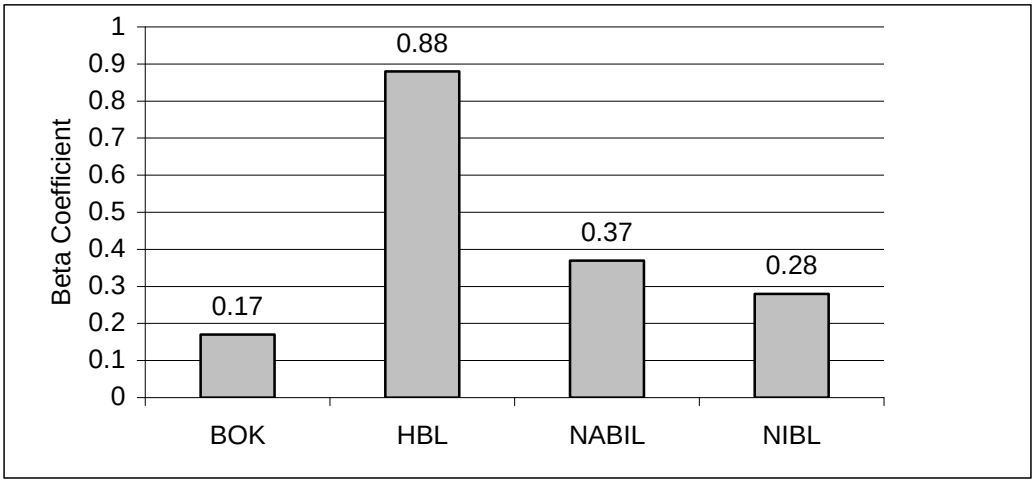
Commercial Banks	Cov (R_j, R_m)	$_{im}$	Remarks
BOK	832.77	0.17	Defensive stock
HBL	910.30	0.88	Defensive stock
NABIL	1978.19	0.37	Defensive stock
NIBL	463.54	0.28	Defensive stock

Sources: Annual Report

The Table 4.2 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

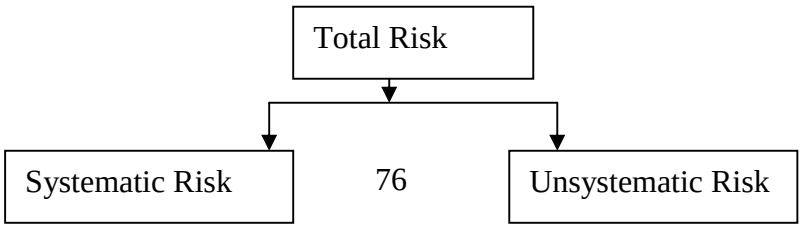
Beta Coefficients of Commercial Banks



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



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The systematic risk is computed as:

Systematic Variance = ^{2} Var (R_m)

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

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

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

= Var (Ri) - $\wp^2$ Var (R_m)

Commercial Banks

Total, systematic and unsystematic risk and their proportions of the stocks of the commercial banks are presented in Table 4.3.

Table 4.3

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

Commercial Banks	Total Risk (VAR)	Systematic Risk [^{2} 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

Sources: Annual Report

The statistical results depicted in Table 4.3 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.

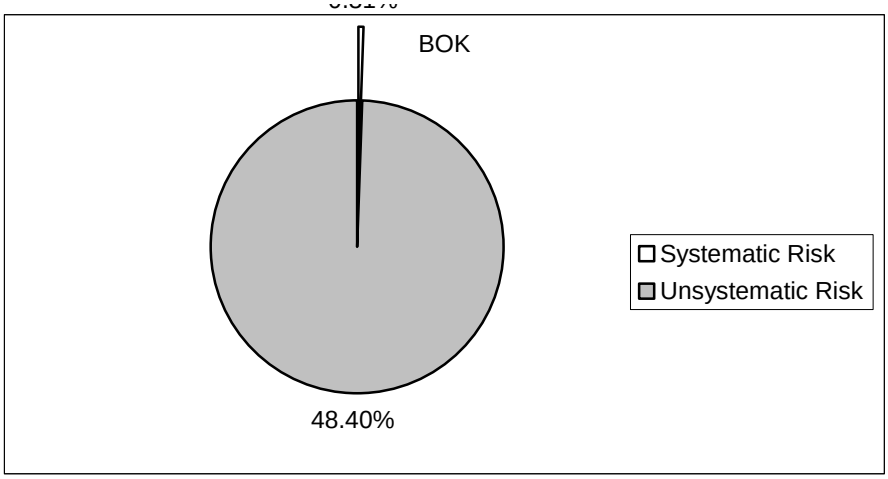
Out of total risk of individual stocks' return, the proportion of systematic risks of BOK, HBL, NABIL and NIBL are 0.006, 0.8, 0.03 and 0.05 respectively. It seems that 0.6% variability of returns of the common stocks of BOK is systematic or is caused by market factors and hence cannot be diversified 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.

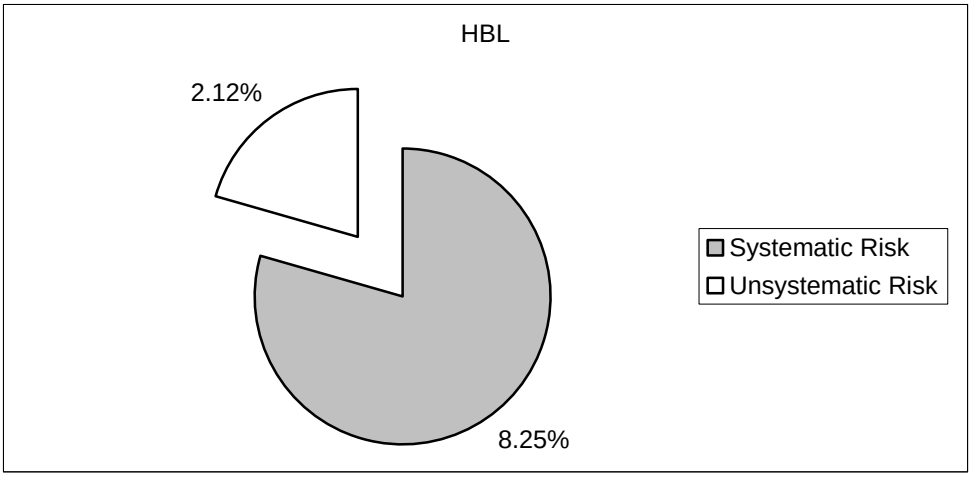
Considering the unsystematic risks, the unsystematic risks of BOK, HBL, NABIL and NIBL are 48.40%, 2.12%, 51.68%, and 15.93% respectively. Among them, the stock of NABIL has the greatest unsystematic risk and HBL has the least unsystematic risk. Out of total risks of BOK, HBL,

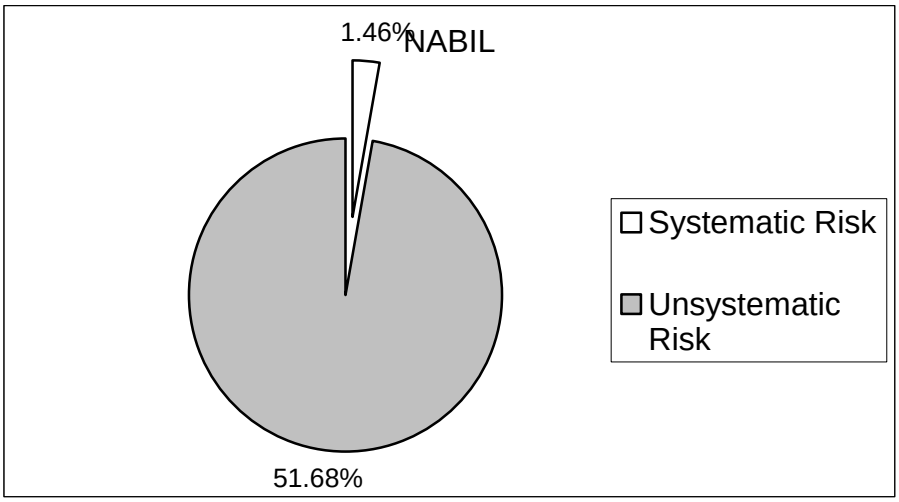
NABIL and NIBL, the respective proportions of unsystematic risk or company specific risk over total risk are 99.40%, 20%, 97%, and 95%, which can be diversified away with an optimal portfolio construction. BOK has the highest company specific risk of 99%. From the unsystematic risk perspective, the management 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 4.3

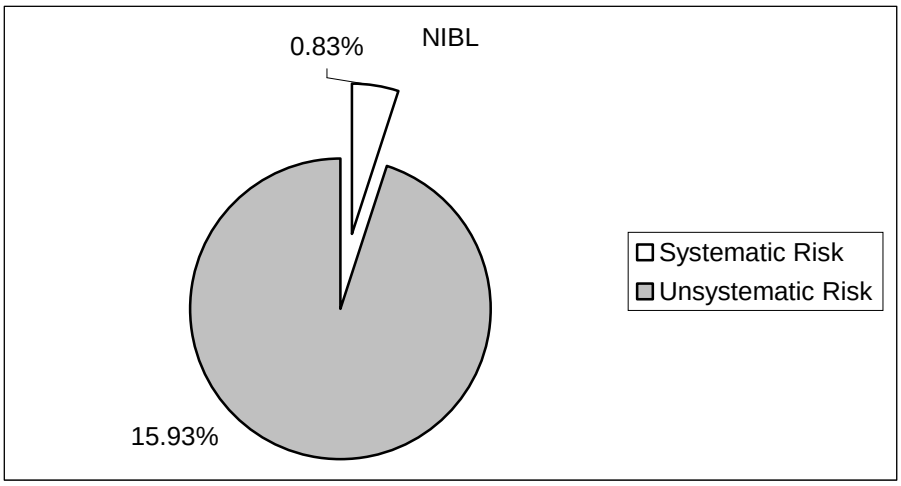
Figure 4.3

Total, Systematic and Unsystematic Risk of CS of CBs









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;

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

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 4.4

Pricing Situation of the Stocks of the Commercial Banks

Commercial Banks	R_f (%)	R_m (%)	Beta Coefficient	Required Rate of Return $R_j = R_f + \beta (R_m - R_f)$	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%	Un-der priced

Sources: Annual Report

The Table 4.4 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 loosing any return.

This attempt is to make which of the commercial bank among the sample 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.

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

Where, Wm = Weight of market portfolio or risk assets

Wrf = Weight of risk free assets

Rf = Risk free asses

$\overline{R}m$ = Expected return on market portfolio

Risk on Portfolio ($\pm_p$) = $W_m \pm_m$

Total risk for two sec *urity portfolio*

$$\pm p \, X \sqrt{w_{rf}{}^2 \pm_{rf}{}^2 \Gamma w_m{}^2 \pm_m{}^2 \Gamma 2 w_{rf} w_m \circ_{rfm} \pm_{rf} \pm_m}$$

$$X \sqrt{w_{rf}{}^2 \mid 0 \Gamma w_m{}^2 \pm_m{}^2 \Gamma 2 w_{rf} w_m \circ_{rfm} \pm_{rf} \pm_m}$$

$$X \sqrt{w_m{}^2 \pm_m{}^2}$$

$$\ldots \pm_p X w_m \pm_m$$

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

Table 4.5
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: Annual Report

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 $f\sigma_p A$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 $f\sigma_p A$ 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 $f\sigma_p A$ 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;

$$Sp = \frac{\text{Risk Premium}}{\text{Total Risk}} \quad X \quad \frac{r_p - r_f}{\pm_p}$$

Where,

SP = Sharp index of portfolio performance of portfolio

$\bar{r}$ p = Average return on portfolio

rf = Risk free rate of return

± p = Standard deviation of portfolio

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

Table 4.6
Portfolio Performance Measure using Sharp's Measure

Commercial Banks	Risk Free Rate (R_f)	Average Return on Portfolio (R_p)	Standard Deviation of Portfolio σ_p	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

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.

Return on Portfolio, (Rp) = w1 . E (R1) + w2 .E (R2)

Variance of Portfolio, (∃p)2 = w12 . ∃12 + w22 . ∃22 + 2 . w1 . w2 . Cov(R1, R2)

or

Variance of Portfolio, (∃p)2 = w12 . ∃12 + w22 . ∃22 + 2 .w1 . w2 . ∃1 . ∃2 . ∂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, $\exists_1$ = 69.34%

Standard deviation of returns on HBL, $\exists_2$ = 32.20%

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

Table 4.7
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 (Rp) =W_1.E(R_1) + W_2.E(R_2)**	Portfolio Standard Deviation **($\pm_p$)**
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 4.7 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, $\exists_1$ = 69.34%

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

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

Table 4.8
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.E (R_1) + W_2.E (R_2)**	Portfolio Standard Deviation ($\exists_p$)	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 4.8 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, $\exists_1$ = 69.34%

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

Covariance of returns between stocks of two banks, Cov (R_1, R_2) = 54.89%

Table 4.9
Investment in BOK and NABIL

Proportionate Investment in BOK's Stock (W_1)	**Proportionate Investment in NABIL's Stock (W_2)**	**(Rp) = W_1.E (R_1) + W_2.E (R_2)**	Portfolio Standard Deviation **($\pm_p$)**	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 4.9 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, Cov (R_1, R_2) = 30.27%

Table 4.10
Investment in HBL and NIBL

Proportionate Investment in HBL's Stock (W_1)	**Proportionate Investment in NIBL's Stock (W_2)**	**(Rp) =W_1.E (R_1) + W_2.E (R_2)**	**Portfolio Standard Deviation ($\pm_p$)**	**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 4.10 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, $\exists_1$ = 32.20%

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

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

Table 4.11
Investment in HBL and NABIL

Proportionate Investment in HBL's Stock (W_1)	**Proportionate Investment in NABIL's Stock (W_2)**	**(Rp) = W_1.E (R_1) + W_2.E (R_2)**	**Portfolio Standard Deviation ($\pm_p$)**	**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 4.11 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, $\exists_1$ = 40.93%

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

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

Table 4.12
Investment in NIBL and NABIL

Proportionate Investment in NIBL's Stock (W_1)	**Proportionate Investment in NABIL's Stock (W_2)**	**(Rp) = W_1.E (R_1) + W_2.E (R_2)**	Portfolio Standard Deviation ($\pm_p$)	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 4.12 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

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

Variance of Portfolio, $\exists_p^2 = w_1^2 . \exists_1^2 + w_2^2 . \exists_2^2 + w_3^2 . \exists_3^2 + 2. w_1 . w_2 . Cov(R_1, R_2) + 2 . w_2 . w_3 . Cov(R_2, R_3) + 2 . w_1 .w_3 .Cov(R_1, R_3)$

$\exists_p = \sqrt{\text{Variance of portfolio return}}$

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 4.13
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 (%)**	**$\pm_p$ (%)**	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 4.13 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, $\exists_1$ = 69.34%

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

Standard deviation of NABIL, $\exists_3$ = 72.89%

Covariance (R_1, R_2) = 24.89%

Covariance (R_2, R_3) = 64.61%

Covariance (R_3, R_1) =54.89 %

Table 4.14
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 (%)**	**$\pm_p$ (%)**	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 4.14 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.

d. 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, $\exists_1$ = 69.34%

Standard deviation of HBL, $\exists_2$ = 32.20%

Standard deviation of NABIL, $\exists_3$ = 72.89%

Covariance (R_1, R_2) = 43%

Covariance (R_2, R_3) = 23.21%

Covariance (R_3, R_1) = 54.89%

Table 4.15
Investment in BOK, HBL and NABIL

Proportionate Investment in BOK's Stock (W_1)	**Proportionate Investment in HBL's Stock (W_2)**	**Proportionate Investment in NABIL's Stock (W_3)**	**R_p (%)**	**$\pm_p$ (%)**	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 4.15 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.

e. 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, $\exists_1$ = 40.93%

Standard deviation of HBL, $\exists_2$ = 32.20%

Standard deviation of NABIL, $\exists_3$ = 72.89%

Covariance (R_1, R_2) = 30.27%

Covariance (R_2, R_3) = 23.21%

Covariance (R_3, R_1) = 64.61%

Table 4.16
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 (%)**	**$\pm_p$ (%)**	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 4.16 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 four 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. The economic development is possible only when domestic resources are properly mobilized and utilized.

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.

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.

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. 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).

This study is based on secondary data obtained from securities board and NEPSE. Out of the recent 27 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. 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 portfolio performance measure index of NIBL seemed highest and that of BOK seemed the lowest among all.

5.2 Conclusions

On the basis of various calculations and analysis, the conclusion of the study is as follows:

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.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 risk and return of BOK and NABIL with respect to various weights of investment 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 i.e. 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, can be 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, 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, so commercial 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.

The total investment made by HBL in Government securities and private sector is not profitable during the sample period as revealed by current study. The bank can 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, all other three commercial banks including HBL are focusing on Govt. Securities for their investment as a result of various factors, among which the important one are government policy and regulation framework of the central banks. Therefore, investment on Govt. Securities should be decreased and investment on other sectors should be increased.

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