

CHAPTER -1

INTRODUCTION

1.1 General Background

Investment is defined simply to be the sacrifice of current consumption for future consumption, whose objective is to increase future wealth. The general principle is that the investment can be retired when cash is needed. The decision to investment now is the most critical decision at the future level of wealth is not certain. Time and risk are the two conflicting attributes involved in the investment decision.

The proper mobilization and utilization of domestic resources become indispensable for any developing countries aspiring for a sustainable economic development. In the changing nature of competition and increasing pressure of globalization on today's business world. Investment management has become the most critical determinant of the economy. Good investment policy has a positive impact on economic development of the country. In recent years international investors are attracted towards the financial market of developing countries. As a result, many joint ventures banks and multinational companies are being established in the country. Banks and other financial institution are playing vital role in the economic development of the country. Successful implementation of investment policy is the prime requisite for the successful performance of banks and other financial institutions. Good investment policy has a positive impact on the economic development of the country.

A healthy development of any bank depends heavily upon its investment policy. So investment operation is very risky one. A sound and viable investment policy can be effective one for the economy to attain the economic objectives. A good investment policy attracts both borrowers and lenders, which help to increase the volume and quality of deposits, loan and investment. The investment policy of bank helps the investment operation of the bank to be efficient and profitable by minimizing the inherent risk. An investment in any fund is made to have some positive rate of return. Nobody is ready to bear risk without any return but to have returned one must ready to face some risk. To minimize the risk at the given rate of return the concept of portfolio diversification is necessary. It is one such tool

that helps for proper utilization of resources. Portfolio is simply a collection of securities gathered to achieve certain investment goals. Usually investors diversify their portfolio's to have minimum risk and maximum the return. So to meet the investment goals, there should be proper managed of portfolio. Most investors hope that if they hold several securities then even one goes bad; the other will provide some protection from an external loss.

"A systematic investment process should be followed to win the stock market. Investment process describes how an investor should go about making decision with regard to what marketable to invest in, how extensive the investment should be and when the investors should we made. A five –step procedure for making theses decision forms the basis of investment process". (*Sharpe et.al,1995:9*)

- I) Set investment policy
- II) Perform security analysis
- III) Construct a portfolio
- IV) Revise the portfolio
- V) Evaluate the performance of portfolio.

Among these investment processes the research is focused on security analysis and portfolio selection. Security analysis involves examine of individual securities or group of securities within the broad categories of financial assets. Portfolio construction identifies those specific assets in which to invest determining the proportion of the investors wealth. Diversification should be done to minimize the risk and maximize the return. Portfolio performance involves determining periodically how the portfolio performs in term of not only the return earned, but also the risk experienced by the investor. The network of a well-organized financial system of the country has great bearing in capital formation. It collects scattered financial resources from the masses and invests them among those engaged in commercial and economic activities of the country. Commercial banks are major financial institution, which occupy quite an important place in the framework of every economy because they provide capital for the development of industry, trade, business and deficit sectors by investing the saving collected as deposits. All the economic activities of each and every country are greatly influenced by the commercial banking business of that country. Thus commercial banks have become the heart of financial system.

1.1.1. Commercial banks and investment portfolio

Commercial banks CB's are those financial institution deal in accepting deposits of persons and institutions and giving loans against securities. They provide working capital needs of trade industry and even to agriculture sectors. It also provide technical and administrative assistance to industries, trade and business enterprises. Commercial bank is a corporation, which accepts demand deposits subject to check and make short-term loan to business enterprises, regardless of the scope of its other services.

The commercial banks play an important role in the development of the modern economy. A CB's must mobilize its deposits and other funds to profitable, secured, stable and marketable sector. So it can earn handsome profit as well as it should be secured and can be converted into cash whenever needed. Investment policy provides the banks several inputs through which they can handle their investment operation efficiently ensuring that maximum return with minimum risk, which ultimately leads the bank to the path of success. So investment decision is the most challenging task for commercial banks. So to meet the investment goals there should be well managed portfolio.

Investment portfolio is one which the income or profit of the bank depends upon directly. Portfolio management is relatively new concept in Nepalese context. The bank should never invest its funds in those securities. Which are subject to too much depreciation and fluctuations because a little difference may cause a grate loss? It must not invest its funds into speculative (sector) businessman who may be bankrupt at once and who may earn million on a minute. The bank should accept that type of securities, which are commercial, durable, marketable, stable, transferable and high market prices. A commercial bank can maximum its volumes of wealth through maximization of return on their investment and lending. So they must investment their funds where they gain maximum profit. Commercial banks must follow the rules and regulations as well as different direction issued by central bank, ministry of finance, and ministry of law and other while mobilizing its funds. So CB's should incorporate several elements such as regulatory

environment, the availability of funds the selection of risk etc while making in vestment decision.

The concept of banking system was introduced in Nepal with the establishment of Nepal bank ltd. In 1937 A.D., But the financial senario of Nepal changed with the establishment of joint venture banks in 1984 A.D. Nabil bank ltd is the first joint venture banks introduce in Nepal. Since the joint venture banks introduce in Nepal, the set up of joint venture banks are increasing day by day and domestic banks like Nepal Bank Ltd and Rastriya Banijya Bank no longer been able to enjoy monopoly. There is cut throat competition among these banks, which is healthy sign for the economic development of the country. In this competitive and market oriented open economy, each and every CB's and financial institution has to play a determining role by widening various opportunities for the shake of expanding provision of best service to their customers and by making themselves as a strong and potential financial intermediaries as per countries need of present scenario to obtain the desired level of economic development of nation.

Nepal is one of the least developed countries; the commercial banks have played a catalytic role in the economic growth. Generally the investment of the CB's include the investment on government securities like Treasury bills, Development bond, National saving bond , Foreign government securities, Shares on government owned companies and non government companies and investment on debentures however portfolio management activities of Nepalese banks are in developing stage. Among the established commercial banks eleven are listed in NEPSE and for this research only eight joint ventures banks are taken.

1.1.2. Security Market In Nepal (NEPSE)

Nepal stock exchange is a non-profit organization operating under securities exchange act, 1983. NEPSE opened its trading floor on 13th January 1994 through licensed members. The authorized and issued capital of the exchange is Rs. 50 million of this Rs.30.41 millions is subscribed by HMG/N, Nepal Rastra Bank, Nepal Industrial Development Corporation and licensed members. Security exchange center (SEC) established with an objective of facilitating and promoting

the growth of capital markets. Before conversion into stock exchange center, it was only the capital market institution undertaking the job of brokering, undertaking, managing public issue, market making for government bonds and other financial services. His Majesty's government under a program initiated to reform capital market, converted securities exchange center into Nepal stock exchange center into Nepal Stock Exchange in 1993.

In the words James H. Lories and peter Dodd "Stock market is the financial market which probably has the greatest glamour and it perhaps the least understood. Some observer considers it has legalized heaven for gambling and many investors consider stock market investing as a game in which sole purpose is picking winners." The basic objective of NEPSE is to impact free marketability and liquidity to the government and corporate securities by facilitating transactions in its trading floor through market intermediaries, such as broker, market intermediaries etc.

➤ **Organizational structure:**

NEPSE is working under SEBON. It has its own board of directors (BOD) to direct to formulate the policy matter and to run the security transaction business in the country. The BOD is responsible to form the policy for the development of capital market. The BOD consist nine members. Ministry of finance, HMG/N nominates Chairman, NRB nominates two directors, two directors represent from licensed member through election and securities and exchange board of Nepal can nominates two directors.

➤ **Members:**

At present there are 27 member brokers and 2 market maker s who operate on the trading floor as per the securities exchange act, 1983, rules and byelaws. There are 11 sales, issue manager, and 2 dealers (secondary market).

➤ **Listing**

Trading on the floor of the NEPSE is restricted to listed corporate securities and government bonds. At present, 120 companies have listed their securities to make

them eligible for trading. The listing fee and annual fee to be paid by the listed company are based on the capital of the company.

➤ **Trading system**

NEPSE has adopted an "Open-Out-Cry-"system. It means transactions of securities are conducted on the open action principle in the trading floor. The buying broker with the highest bid will port the price and code number of the selling columns on the quotation board. The market maker quote they are bid and offer price of their own board before the floor starts. Once the bid and offer price match, contracts between the buying and selling brokers or between the brokers and market makers are the concluded on the floor. (Trading report of NEPSE, 2002)

1.2 Focus of the Study

Portfolio Management:

Harry M. Markowitz originally proposed portfolio theory in 1952. Markowitz diversification is the combining of assets, which are less than perfectly correlated in order to reduce portfolio's risk. It can sometimes reduce risk below the un-diversifiable level. Markowitz diversification is more analytical than simple diversification and considers assets correlation. Risk adverse investors select efficient portfolio that maximizes return at a given level of risk or minimizes risk at a given level or return. With the collection of those efficient portfolios the optimal portfolio can be obtained for given investors. By combining securities of low risk with securities of high risk, success can be achieved by an investor in making a choice of investment outlets.

Risk and Return on Portfolio

It is common problem of investment manager how to maximize the expected return of the portfolio subject to some target level of volatility. That is investment weights are done to have best performance for an expected level of standard deviation. That target standard deviation is determined by the investor's tolerance

for risk, Expected returns depends upon the firms life cycle and returns of mature firms with those of growth firms. Time variation can play an important role in determining expected returns of mature firms than of growth firms. Effective risk and return management strategy should be applied in order to manage portfolio risk and return.

The research focuses on the empirical study of those stocks trading at Nepal stock exchange, which is secondary market in Nepal. This study mainly tries to find out a profitable portfolio alternative with the effective use of available liquidity of public. People have liquidity but they are unproductive. So they try to find out available best alternative and best portfolio, which will increase wealth position of the investor and indirectly contribute to the economic growth of the nation.

1.3 Statement of the problem

The major problem in almost all under developed countries is capital formation and proper utilization. Mostly people are unknown about the risk and reward associated with stocks. They even do not know the stocks can be the best alternative to maximize their wealth. They are investing their funds in unproductive sector. This is because of lack of knowledge of investment opportunities available in financial market. NEPSE is the only market of providing information; it is not sufficient and reliable for making investment decision. In general each investor wants to increase the level of return and decrease the level of risk. To avoid these problems CB's have more responsibilities. Various CB's have played vital economic role by accepting deposits and providing various types of loans, that means invest them in productive field. The development of the country is directly related to the volume of investment in productive sector.

Portfolio management is relatively new concept in Nepalese context. Many institutions still have less awareness while investing in productive sector. They have no consideration towards portfolio optimization. They just rely upon the instruction and guidelines of Nepal Rastra Bank. They still have less clear vision towards investment portfolio. They do not try to pay due attention towards proper matching of deposited and investment portfolio, which creates financial problem

enforcing commercial banks to take wrong decisions. In these study investors refers to the institution investors. Investors can be classified into three categories on the basis of risk and return. First type of investor are risk lover investor, who become ready to face high risk, in the hope of high return. The second type of investor are risk avoider investor who try to avoid facing high risk and became ready to be satisfied in low return . The third types of investors come along in between these two investors. They are ready to bear medium risk and have medium return. The study has examined whether these investors are aware about the portfolio management of the institutions they are investing or not. How effectively the financial institution is mobilizing their investment and whether the return that investors get back is sufficient or not in compare to the risk they are bearing. It is not necessary that the investor who bears high risk have high return. The portfolio return is the straight weighted average of return from the individual assets. But the portfolio risk is affected by the variance of return as well as the covariance between the returns of individual assets included in the portfolio and their representative weight.

The study has examined about the condition of portfolio management in financial institution whether the institution have maintained portfolio management or not? If they have portfolio management then what is the rate of risk in their institution and their associated risk of the securities listed in NEPSE? And for bearing that risk what is the rate of return they are having? But if the institutions are careless about the portfolio management how much profit maximization they are having and how they are maintaining their earning? What is the different between the earning per share (EPS) of the institutions that portfolio management and do not have portfolio management. The study also tried to find out the relationship between earning per share (EPS) and market price per share (MPS) of financial institution and which is the optimum portfolio in NEPSE to invest?

1.4 Objectives of the study

The main objectives of the study is to analyze, examine and interpret portfolio techniques followed by investor on their investment in various securities. This

study focuses whether the investor properly followed portfolio concept to take investment decision or not. The specific objectives of the study are as follows.

- To analysis the portfolio of commercial banks for an investor.
- To analyze risk and return of investment securities.
- To evaluate the optimum portfolio of security trading in NEPSE.
- To analysis the stability of risk and return of the securities.

1.5 Significance of the study

Nepal being listed among least developed countries, the commercial banks and other financial institution plays vital economic development of the country. The main objective of commercial banks is to earn profit by proper mobilization of resources. The research actually held in the fact of today's situation of Nepal. People are looking for investment alternatives.

In Nepalese commercial banks, they do not have clear vision towards effective investment. They are found to be making investment only on short-term basis. There is hesitation to invest in long-term projects because they are much more safety minded. Even they are various ways to minimize risk, they are not aware and do not take any attention towards such field i.e. they do not think about portfolio management. Hence the main significant of this study of investment portfolio analysis of Nepalese commercial banks is to help how to minimize risk on investment and maximize return through portfolio analysis. This research is important to acknowledge them how important risk and return calculation and motive them for rational investment. They can compare market risk and individual risk to conclusion whether the security is as risky as market or not. This type of research provides filtered information. This research will inform him about valuation of stock is over- priced or under – priced.

So this research helps to increase analytical skill, communicative skill and decision– making on investment and suggestions for its improvement.

1.6 Scope and Limitation of the study

Some of the limitations are as follows.

- The study has only covered the listed commercial banks in Nepal stock exchange (NEPSE).
- The problem of non-availability of required data and information regarding portfolio management may limit the scope of the study.
- The study mainly based on secondary data collected from different sources.
- Risk and return measurement is taken as the tools of the methodology.
- The study is simply a partial study for the fulfillment of MBS degree. So the study cannot cover all the dimension of the subject matter and time period is also limited.
- It is assumed that all the investors are rational and well known about the portfolios theory and investment strategies.

1.7 Chapter Plan

The research has been classified into five basic chapters:

Chapter I: Introduction

The first chapter includes general background, commercial banks and investment portfolio, focus of the study, statement of the problem, objective of the study, signification of the study, scope and limitation of the study.

Chapter II: Review of literature

The second chapter includes theoretical review, review of related studies and review from thesis.

Chapter III: Research Methodology

The third chapter includes research design, data collection procedure, sample, tools and techniques for analysis.

Chapter IV: Analysis and presentation of data

The fourth chapter includes cross sectional data of banks, analysis of market risk and return, analysis of market sensibility, analysis of systematic and unsystematic risk. Analysis of the required expected return, analysis of portfolio risk and return, and calculation of optimal portfolio composition.

Chapter V: Summary, Findings and Recommendations

The fifth chapter includes summary findings, recommendations and suggestions.

CHAPTER -2

REVIEW OF LITERATURE

This chapter deals with the theoretical aspect of the topics on investment portfolio in more detail and comprehensive review of recent and relevant literature. For this study basic academic course books journals, articles, annual reports and some research paper related with this topic have been reviewed. Therefore this chapter is arranged into the following order.

- 1) Theoretical Review
- 2) Review of Related Studies
- 3) Review of Thesis

2.1 Theoretical Review

It provides the fundamental theoretical framework and foundation on the present study.

2.1.1 Investment

An investment involves the sacrifice of current rupees for future rupees. The sacrifice takes place in the present and certain while the reward comes later and uncertain. Investment involved long term commitment and waiting for a reward. It involves the commitment of resources that have been saved or put away from current consumption in the hope that some benefit will occur in future.

Investment brings forth vision of profit, risk, speculation and wealth. They have briefly describes the categories and types of investment alternatives. The describes that the basic investment objectives the expected rate of return the expected risk, taxes, the investment horizon and investment strategies are the factors to be considered in choosing among investment alternatives. (Cheney and Moses, 1992: 8-12)

According to Gitman and Joehnk "Investment in any vehicle into which funds can be placed with the expectation that will preserve or increase in value and generated positive return."

In the words Frank and Reilly "An investment is the current commitment of funds for a period of time to derive a future flow of funds the will compensate the investing unit for the time funds are committed for the expected rate of inflation and also for uncertainty involved in the future flow of the funds."

2.1.2 Investment process

The investment process described how an investor makes decision about what securities to invest in, how extensive this investment should be and when they should be made. The investment process involved three steps:

1) Set investment policy

The first step of the investment process is to set investment policy. It determines the objectives and the amount of his/her investment fund. Investor objective should be stated in terms of both risk and return. This step involves the identification of the potential categories of financial assets for consideration in the ultimate portfolio. This identification will be based on the investment objectives amount of investable wealth and tax status of the investor.

2) Perform security analysis

In this step, security analysis involves examining a number of individual securities/ groups of securities with-in the broad categories of financial assets. The investor will evaluate them in term of their price whether they are under priced or overpriced, risk associated with that specific security his expected return and real return and so on. There are two main securities.

- i) Technical analysis
- ii) Fundamental analysis

3) Construct a portfolio

Construction of portfolio involves identification of specific securities in which to invest, along with the proportion of invest able wealth to be put into each securities. The investor may construct portfolio according to his interest either he

wants active or passive strategy to manage his investment. There should be clear vision of strategy, risk bearing capacity and required rate of return before deciding the alternatives of investment.

4) Revise the portfolio

This step involves both realizing that the currently held portfolio is not optimal and specifying another portfolio to hold with superior risk return characteristic. This investor must balance the cost of moving to the new portfolio against the benefit of the revision.

5) Evaluation portfolio performance

Evaluation of portfolio performance involves determination of the actual performance of a portfolio in terms of risk and return and compared the performance with that of an appropriate "benchmark" portfolio.

2.1.3 Investment alternatives

A wide range of investment alternative is available to individual investors and institutional investors (Cheney and Mosed 1992 13)

The financial manager decides on a suitable maturity pattern for the holdings on the basis of how long the funds are to be hold. If the funds are wrongly invested without any financial risk, business risk and other various types of risk and facts, the bank cannot obtain profitable return as well as it should sometimes lose its principle. Therefore the suitable alternative can be selected and balanced in such a way those maturities and risk appropriate to the financial situation of the firm is obtained. Therefore various alternatives, which are as follows:

1) Equity securities:

Equity securities represent ownership shares in a corporation. Equity securities are traded in organized exchange and OTC market.

- Common stock: Common stock is an ownership share in a corporation.
- Preferred stock: Preferred stock is a fixed income security. Preference shareholder does not have voting rights. It is suitable for that investor who does not want to bear high risk but wants fixed return.

2) Debt securities:

Debt securities are those on which interest has to pay and they have certain maturity period. Debt securities can be divided into two parts. They are as follows:

a) Short term debt securities

It is the obligation that matures in one year or less, short term debt securities are traded in the money market.

They are as follows:

- Negotiable certificate of deposit.
- Commercial paper.
- Banker's acceptance.
- Treasury bills.

b) Intermediate and long-term debt securities:

It is the obligation that matures in more than one year. Intermediate and long term debt securities are traded in OTC market. They are as follows:

➤ Government Securities:

Government securities are fixed income securities issued by the government. These securities are among the safest of all investment as the government is unlikely to default on interest or on principal repayments.

They are as follows:

- i) Treasury notes
- ii) Treasury bonds
- iii) Saving bonds

➤ Agency securities

Agency securities are traded in the OTC market.

- i) Government National Mortgage Association
- ii) Federal Home Loan Mortgage Corporation
- iii) Federal National Mortgage Association

➤ Municipal securities

Municipal bonds are debt obligations issued by state or local government and agency

- i) Revenue bonds
- ii) General obligation bonds

- Corporate bonds

It is traded in organized exchanges and the OTC market.

3) Hybrid Securities

Securities that have characteristics of both equity and debt are called hybrid securities.

- Convertible preferred stock
- Convertible bonds

4) Derivative Securities

Securities that derive their value from the value of an underlying assets

- Option
- Commodity futures
- Financial futures
- Option on future
- Rights
- Warrant

5) Real assets

Real assets are the non-financial assets

- Precious metal
- Real estate
- Collectibles

6) International investments:

International investments are the investment by individuals in debt or equity securities issued by organizations outside the country of residence of the investor.

- Multinational corporation
- Foreign stocks traded on a local exchange.
- American depositary receipts.

7) Other investment alternatives

- Pension fund
- Mutual fund
- Closed - end companies

2.1.4 Risk and return

A major purpose of investment is to get a return or income on the funds invested. Each asset expected return and risk, along with the expected return and risk for other assets and their inter relationships are important input in portfolio selection. In order to construct efficient portfolio the investor must be able to quantify the portfolio's expected return and risk.

Risk

Risk and uncertainty are real in life. Everyone encounters uncertainty in every day's life. Risk and uncertainty are an integral part of an investment decision. Risk can be defined as a situation where the possible consequence of the decision that is to be taken is known. "Uncertainty" is generally defined to apply to situation where the probabilities can not be estimated (Cheney and Mosses, 1992: 15)

Risk is uncertainty of whether the money investors lend will be returned. They have regarded such risk as bankruptcy risk. They said that stockholders of the firm should not only consider bankruptcy risk but also the risk that the firm will yield a rate of return below some targeted rate. They have given range, variance, standard deviation, coefficient of variation and beta as parameters for the measurement of risk. They describes beta as a parameter for the measurement of the systematic risk. Systematic risk has been defined undiversifiable risk, which is beyond the control of the organization. Apart from this they describe unsystematic risk, as diversifiable risk, which can be reduced through the portfolio effect. Further beta values for assets generally range between +0.5 and 2.0.

Segregation of Risk

1) Systematic Risk

Systematic risk is that parts of total risk, which cannot eliminate. Systematic risk or undiversifiable risk is a function of its covariance with market portfolio of all assets divided by the variance of the market portfolio.

The portions of the total risk of an individual security caused by market factors that simultaneously affect the price of all securities. It can't be diversified away. Systematic risk is the market risk. Which could not be avoidable it is also called market risk or unavoidable risk or non-diversifiable risk or beta risk. The beta of the stocks is the slope of the characteristics line between return for the stock and those for the market. Beta depicts the sensitivity of the securities excess return to that of the market portfolio. This type of stock often called aggressive stock and slope less than 1 called defensive stock.

The un-diversifiable risk is caused by such factors which systematically affect all firms such as:

-) War
-) Inflation
-) Recession
-) Interest rate policy
-) Corporate tax rate policy

Since all securities will tend to be negatively affected by these factors systematic risk cannot be eliminated by diversification therefore and investor will expect a compensation for bearing this risk.

ii) Unsystematic risk

The portion of the total risk that can be diversified away; it is also called non-market risk or avoidable risk or company-specific risk or diversifiable risk. Such unsystematic risk can be totally reduced through costless diversification. This risk is related at a decreasing rate towards zero as more randomly selected securities are added to the portfolio. Various studies suggest that 15-20 stocks selected randomly are sufficient to eliminate most of the unsystematic risk of portfolio. (Van Horne, 2002: 55-69). It is caused by events particular to the firm. Event such as labor strikes, management errors, inventories, advertising companies, shift in consumer taste and law-suits cause unsystematic variability in the value of market assets. Since unsystematic changes affect one firm, or at most few firms, they must be force casted separately for each firm and for each individual incident.

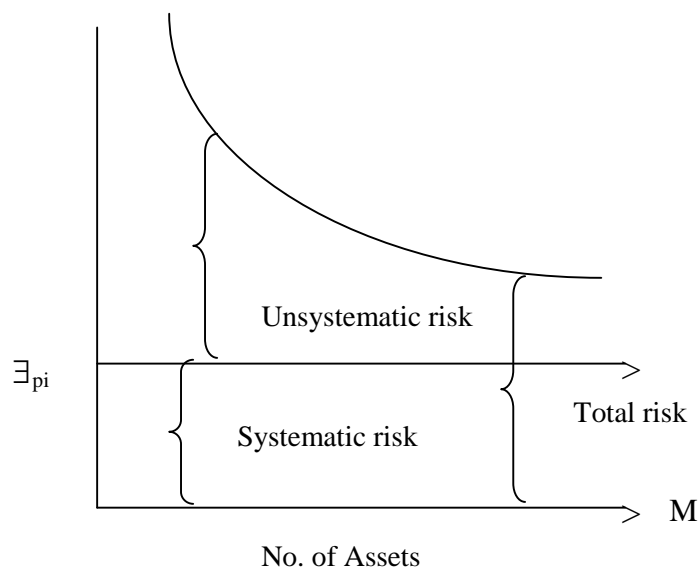
Unsystematic security prices movement are statistically dependent from each other.

Some sources of unsystematic risk are:

-) Labour strike
-) Management errors
-) Inventions
-) Advertising companies
-) Shifts in consumer taste
-) Unsuccessful marketing programs.
-) The winning and losing of major contracts.
-) Other events and are unique to a particular firm.

Since these events are essentially random, their effects on a portfolio can be eliminated by diversification i.e. bad events in one firm will be offset by good events in another.

Figure 2.1
Risk and diversification



Source: James.C.Van.Horne, Financial Management Policy; 11th edition.
(New Delhi, Prentice hall of India private limited 2000), New Delhi

Measurement of risk

Standard Deviation

Standard deviation is a statistical concept and is widely used to measure risk from holding a single assets. A high standard deviation represents a large dispersion of return and is a high risk a low deviation is a small dispersion and represents a low risk. It provides more information about the risk of the assets.

Coefficient of variation

Risk is measured by the standard deviation, and then risk per unit of expected return can be measured by the coefficient of variation (C.V). High C.V. represents the highest risk of the investment. The C.V. shows the risk per unit of return and it provides a more meaningful basis for company when the expected return and risk on two alternatives is not the same. (Weston And Brigham, 1993, 173)

Beta

"The beta is simply the slope of the characteristic line. It depicts the sensitivity of the security's excess return to that of the market portfolio if the slope is one, it means that excess return for the stock vary proportionality with excess return for the market portfolio. In other words, the stock has the same unavoidable or systematic risk as the market as a whole. A slope steeper than one means that the stocks excess return varies more than proportionality with the excess return of the market portfolio". (Van Horne and Wachowicz. 1997:69)

"Beta measures non-diversifiable risk. Beta shows how the price of a security responds to market forces. In effect, the more responsive the price of a security is to changes in the market, the higher will be its beta is calculated by relating the returns on a security with the returns for the market. Beta can be positive or negative. But nearly all betas are positive". (Fisher and Jordan 6th edition: 82)

Capital assets pricing model

The CAPM is sometimes used to estimate the required rate of return for any firm with publicly traded stocks. The CAPM is based on the premise that the only important risk of a firm is systematic risk or the risk that results from exposure to general stock market movements. The CAPM is not concerned with so called unsystematic risk, which is specific to an individual firm, because investors can avoid that type of risk by holding diversified portfolios.

The CAPM states that the expected risk premium on each investment is proportional to its beta, this means that each investment should lie on the sloping security market line connecting treasury bills and market portfolio. (Brealey and Myers 2000: 197).

Return

Return is reward for investment a major purpose of investment is to get a return or income on the invested. On a bond an investor expects to receive interest and on a stock dividends may be anticipated. So return from investment has different meanings to different investors. Some companies seek near term cash inflow and give less value to more distant returns. Other investors are concerned primarily with growth. Still others measure return using financial ratios. They might seek to invest in a company that has a high return on investment.

All the investor wants to maximize expected returns subject to their tolerance for risk. Return is the motivating force and it is the key method available to investors in comparing alternative investments. Realized return and expected returns are two terms which are often used in the language of investment. Realized return is after the fact return, return that was earned or it is history. Expected return is the return from an asset that investor will earn over some future period. It is a predicted return which may or may not occur.

2.1.5 Portfolio analysis

In Nepalese context many Nepalese private investors placed their entire wealth in a single investment. It is because of proper awareness about portfolio. A portfolio is a bundle of or 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 investor decision to investment in assets or securities under risk. The main objective of the portfolio analysis is to develop a portfolio that has the maximum return at specified degree of risk. Therefore analyzing risk and return or portfolio context is necessary.

Harry M. Markowitz originally proposed portfolio theory in 1952 (Markowitz, 1952: 77-91). It is concerted with selecting optimal portfolio by risk adverse investors. Risk adverse investors selects efficient portfolio that maximizes return at a given level of risk or maximized risk at a given level of return.

"While the portfolio expected return is a straight forward weighted average of return on the individual securities, the portfolio standard deviation is not the simple weighted average of individual security standard deviation. To take a weighted average of individual security, standard deviation would be to ignore the relationship or covariance between the return on securities. This covariance however doesn't affect the portfolios expected return". (Van Horne et.all. 1995: 96)

2.1.6 Portfolio Analysis and Diversification

Investment risk can be reduced by including more than one alternative of assets in the portfolios and by including more than one asset from each category. Hence diversification is essential to the creation of an efficient investment because it can reduce the variability of returns a round the expected return. This diversification may significantly reduce risk without a corresponding reduction in the expected rate of return on the portfolio. (Francis, 2000: 252-265).

Diversification is the one important means that control portfolio risk. Investments are made in a wide variety of assets, so that exposure to the risk of any particular

security is limited. By placing one's eggs in many baskets overall portfolio risk actually may be less than the risk of any component security considered in isolation. (Bodie et.al, 2002: 162-208)

If the investors diversify funds into many more securities that continue to spread out firm specific factor and portfolio volatility should continue to fall. Ultimately, however even with a large member of stocks investors can not avoid risk altogether. Since all securities are factors when all risk is firm specific diversification can reduce risk to a negligible level. When common sources of risk affect all firms however even extensive diversification can not eliminate risk that is due to market risk or systematic risk on average portfolio risk does fall with diversification to reduce risk is limited by systematic or common source of risk.

Here are some different diversification techniques for reducing a portfolio's risk:

) **Simple Diversification:**

Simple diversification can be defined as "not putting all the eggs in one basket" or spreading a risk. They made the portfolio from randomly selected securities and allocated equal weights "spreading the portfolios assets randomly over two or three times as many stocks can not be expected to reduce risk any further." It is the random selection of securities that are to be added to portfolio. Simple diversification reduces a portfolio's total diversification risk to zero and only the un-diversification risk remains.

) **Diversification Across Industries:**

Some investment counselors advocate selecting securities from different industries to achieve better diversification. It is certainly better to follow this advice than select all securities in a portfolio from one industry. Since all the industries are highly correlated with one another diversification across industries is not much better than simply selecting securities randomly?

) **Superfluous Diversification**

Such portfolio diversification that has excess no. of assets (more than 15) know as superfluous diversification. It refers to the investors spreading himself in so many investments on his portfolio. It may lower the net return to the portfolio's owners after the portfolio's management expenses are deducted, even through their will most likely be no concurrent improvement in the portfolio's performance. In this context, Clarke's add that superfluous diversification usually result in the following portfolio management problems.

-) Impossibility of good portfolio management
-) Purchase of lackluster performers
-) High transactions costs
-) High search costs

He describes that although more money is spent to manage a superfluously diversified portfolio, there will most likely to be no concurrent improvement in the portfolios performance. Thus superfluous diversification may lower the net return to this portfolios owner after the portfolios management expenses are deducted.

) **Markowitz Diversification**

Markowitz diversification may be defined as combining assets that are less than perfectly positively risk correlated in order to reduce portfolio risk without specficing portfolio returns. It can sometimes reduce risk below the non-diversification level. Markowitz diversification is more analytical than simple Markowitz diversification and considers assets correlation. The lower correlation between assets the more that Markowitz diversification will be able to reduce the portfolio's risk. Markowitz diversification can lower risk below under diversification level if the securities analyst find securities, whose rates of return have low enough correlations. Unfortunately there are only a few securities that have low correlation. Therefore, using Markowitz diversification requires a data

bank of financial statistical for many securities a computer and some economic analysis.

Markowitz paper is the first mathematical formalization of the idea of diversification of investment; the financial version of "the whole is greater than the sum of its part" through diversification, risk can be reduced without changing expected portfolio return. The decision to hold a security should not be made simply comparing its expected return and variance to others, but rather the decision to hold any security would depend on other securities the investors wants to hold. Securities could not be properly evaluated in isolation, but only as a group.

2.1.7 Portfolio selection

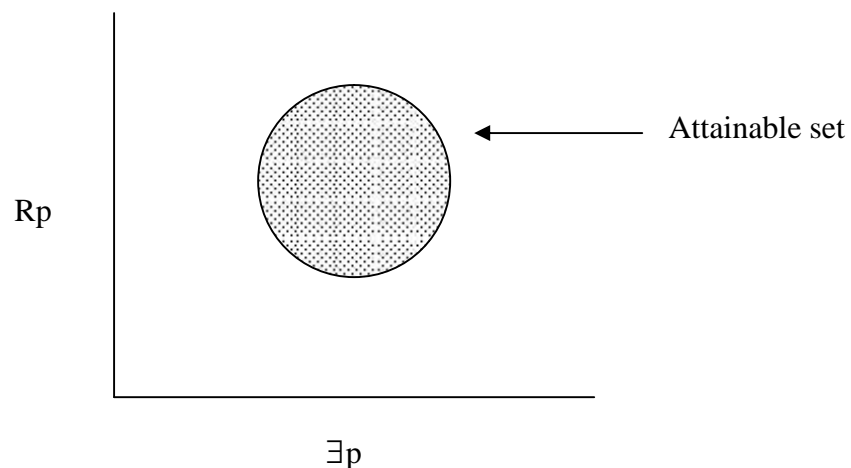
There are three steps to select a portfolio by an investor.

1. Determination of portfolio opportunities or attainable set of portfolio

It is the first step of select the optimum portfolio. From the various securities we can combine limited no. of portfolio. Each possible portfolio will have an expected rate of return and risk.

Figure 2.2

Determination of portfolio opportunities or attainable set of portfolio

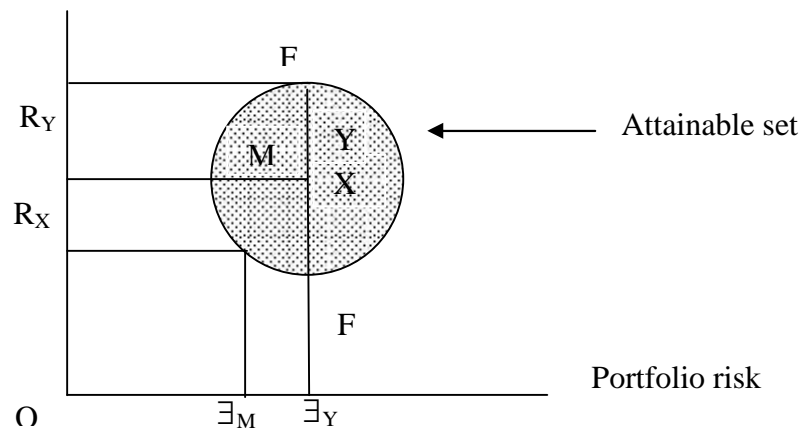


The hypothetical set of all possible portfolios called portfolio opportunity set or attainable sets.

2. Determination of efficient set

Efficient set is the collective form or set of portfolio. Efficient set theorem explains now investor will choose their portfolios from the set of efficient portfolio. If we consider the infinite number of portfolios that could be formed from two or more securities and plotted portfolios expected return and risk, we would create a graph like the one in the figure. The efficient frontier is represented by the line from E to F. Portfolios along curve EF dominate all other investment possibilities.

Figure 2.3
Determination of efficient set



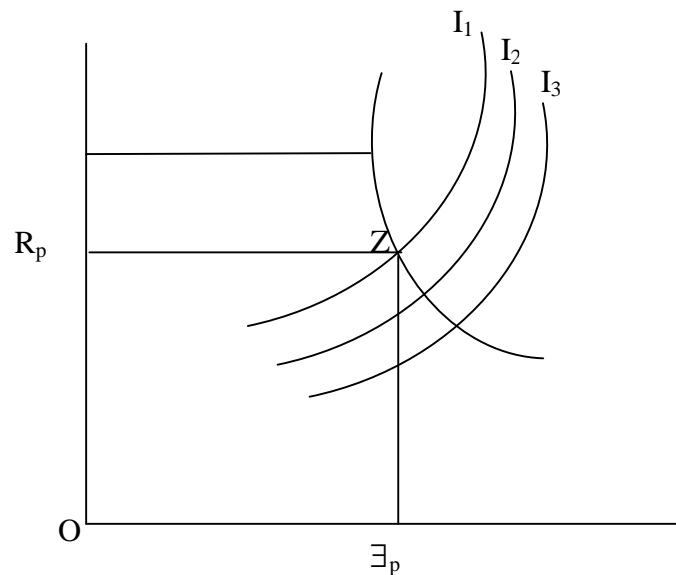
An efficient frontier or portfolio is a portfolio that provides the highest possible expected return for varying level of risk or the lowest possible degree of risk for varying level of expected return. Portfolios to the left of the efficient frontier are not possible, they lie outside the attainable set. Portfolios to the right of the efficient frontier are inefficient because some other portfolio could provide either a higher return with same degree of risk or a lower risk for the same rate of return. In figure X is a portfolio which provides R_X return with Ξ_Y risk and Y is the portfolio which provided R_Y return with same level of risk of Ξ_Y and portfolio M provided same rerun of R_X as portfolio X with less risk than that of portfolio X. Because of both portfolio Y and M lies in efficient frontier.

3. Selection of optimal portfolio

After finding the efficient frontier, select the optimal portfolio, which maximized the utility of investors with the help of indifference curve.

Figure 2.4

Selection of optimal portfolio



In the above figure, indifference curve I_1 , has higher utility than that of I_2 and I_3 . An investor selects that portfolio which lies in the efficient frontier of the opportunity set which is tangent to the indifference curve of the investor and the portfolio becomes optimal for him. The indifference curve I_1 , tangent with efficient frontier at the point z . Here investor's optimal portfolio is Z . Therefore, this point Z makes a highest level of satisfaction an investor can achieve.

2.1.8 Review of Popular Model of Portfolio

2.1.8.1 Harry M. Markowitz and portfolio selection model

Harry M. Markowitz originally proposed portfolio theory" portfolio selection" in 1952. Markowitz diversification is the combining of assets, which are less than perfectly correlated in order to reduce portfolio's risk. It can sometimes reduce risk below the un-diversifiable level. Markowitz diversification is more analytical than simple diversification and considers assets correlation. Risk adverse investors

selects efficient portfolio that maximizes return at a given level of risk or minimized risk at a given level of return. With the collection of those efficient portfolios the optimal portfolios can be obtained for given investors. A theory, which involved into a foundation of for further research in financial economics Markowitz, showed that under certain given conditions, an investors portfolio choice reduced to balancing two dimensions i.e. the expected return on the portfolio and its variance. Portfolio is the combination of the various securities. To choose the combination of the security, it is really a challenge to the investor to choose the combination. By combining securities of low risk with securities of high risk, success can be achieved by an investor in making a choice of investment outlets.

Markowitz diversification may be defined as combining assets, which are less than perfectly correlated in order to reduce portfolio risk without sacrificing portfolio return. It is more analytical than simple diversification and considers assets correlation or covariance is portfolio formation it shows that lower the correlation between assets. More no. of security will be able to reduce the portfolio risk. Markowitz used the variance of return as the measure of risk. The portfolio model developed by Markowitz is based on the following assumption.

-) This theory assumes for the same holding period return for all securities.
-) The risk of an individual assets or portfolio is based in the variability of return.
-) Investor prefers high return to lower return for a given level of risk. Similarly for a given level of expected return, investor prefers less risk. (Cheney and Moses, 1992: 651)
-) Investor makes investment rationally.

2.1.8.2 Capital Assets Pricing Model

The relevant risk for an individual asset is systematic risk because un diversifiable risk can be eliminated by diversification. The relationship between an assets return and its systematic risk can be expressed by the CAPM, which is also called the security market line (SML). "It is the model that describes the relationship between risk and expected return. The CAPM provided a framework for basis risk and

return off in portfolio management. It explains the behaviour of security prices and provides a mechanism to assess the impact of a proposed security investment on investors, overall portfolio risk and return. It enables drawing for bearing risk certain implications about risk and the size of risk premium necessary to compensate. (Khan and Jain, 1992: 2.23.2.25)

The equation for the CAPM is

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

R_j = the expected return on the j^{th} risky assets

R_f = The rate of return on a risk less assets

R_m = the expected return on the market portfolio

$\beta_j = \text{Cov}(R_j, R_m) / \text{Var. } R_m$

= A measure of the undiversifiable risk of the j^{th} security

The CAPM based on the following assumption:

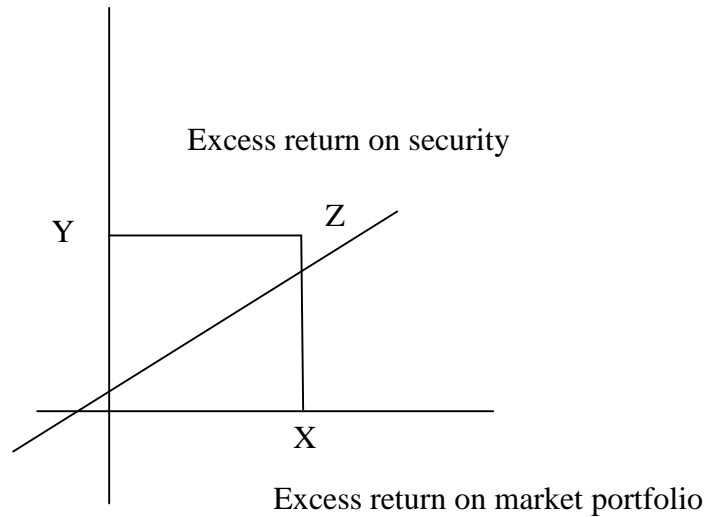
- i) Individual are risk reverse
- ii) Individuals have homogeneous expectations; they have identical subjective estimated of the means, variance and covariance among the return.
- iii) Individual can borrow and lend freely at a risk less rate of interest
- iv) The market is perfect there are no taxes: There are no transaction cost securities are completely divisible the market is competitive.
- v) The quantity of risky securities in the market is given.

2.1.8.3 The Single index model

The simplification of Markowitz model has come to be known as the market model of single index model (Valla, 1994: 526-537). The single index model provided that the desirability of any stock is directly related to its excess return to beta ratio. Single index model for optimal portfolio enable to find out the no. of security to be in optimal portfolio. In this case the desirability of including a stock directly related to its excess return to beta ratio. If stocks ranked by excess return to beta for highest to lowest, the ranking represents the desirability of any stocks inclusion in a portfolio. The number of stocks selected depends on a unique cut of

rate such that all stocks with higher ratios will be included and all stocks with lower ratios excluded.

Figure 2.5
A Security Characteristic Line



The beta of security represents the market linearity of the stock. The market influences each stock. Negative beta defined that security is not linear to market. The security having negative beta coefficient is rejected as investment alternatives. In the same was security that provides lower rate of return than risk free rate of return rejected as investment alternatives. To determine which securities are to be included in the optimum portfolio investors have to find out cut off rate. We can calculate C_j using following formula:

$$C_j = \frac{E_j - R_f}{\sigma_m^2} \frac{S_j}{\sigma_j^2}$$

Where

σ_m^2 = Variance of the market index

R_j = Expected return of stock j.

R_f = Risk free rate of return

σ_j^2 = Unsystematic risk of stock j.

β_j = Beta of stock j.

Investor selects highest C_j value that C^* . The value of C^* is computed from the characteristics of all of the securities that belong in the optimum portfolio. Since, securities are ranked from highest excess return to beta to lowest. Then investor compare C^* with each value $\{ (R_j) - R_f / \beta_j \}$ with each security. Investor selects those greater value than C^* . The selected securities used in upcoming portfolio. To calculate the percentage invested in each security is :

$$\text{Weight of security } j (Z_j) = \frac{Z_j}{\sum_{j=1}^N Z_j}$$

Where,

$$Z_j = \frac{S_j^2}{\sigma_{ei}^2} \frac{R_j - R_f}{S_j} Z_{C^*}$$

Where

C^* = Selected cut of rate

R_j = Expected return of stock j

R_f = Expected rate of return

β_j = Beta of stock j

σ_{ei}^2 = Unsystematic risk of stock j.

2.2 Review of Related Studies

Review of journals, articles and web pages

"International portfolio investment flows" by market J. Brennan and H. Henry Cao. This article develops a model of international equity portfolio investment flows based on differences in informational endowments between foreign and domestic investors. It is shown that when domestic investors passes a cumulative information advantage over foreign investors about their domestic market,

investors tend to purchase foreign assets in periods when the return on foreign assets is high and to sell when the return is low.

Following are the conclusions from the article:

-) The article has developed a model of international equity portfolio flows that relies on informational differences between foreign and domestic investors.
-) The model predicts that if foreign and domestic investors are differentially informed then portfolio flows between two countries will be a linear function of the contemporaneous return on all national market indices; and if domestic investors have a cumulative information advantage over foreign investors about.
-) Domestic securities, the co-efficient of the host market return will be positive.
-) Portfolio flows are associated with return on national market indices as the symmetric information hypothesis implied.
-) The examination of US portfolio investment in emerging markets should the strong evidence that US purchases are positively associated with local market returns in many countries.
-) This model is able to explain only a small proportion of the variance of international equity portfolio flows.

The Edward J. Kane and Stephen A Buser in the title "**Portfolio diversification at commercial banks**" (Kane and Buser, 1979, 19-31) deals with how a firm performs a useful function by holding a portfolio of efficiently priced securities.

According to them, it is rational for a firm to engage in prior fund of assets diversification on behalf of its shareholders even when all assets are priced efficiently and available for direct purchase by shareholders. As a way of testing their perceptive empirically, they estimated regression model designed to explain the no. of distinct of US treasury and federal agency debt held in a time series of cross section of large US Commercial banks. They interpret the systematic pattern of diversification observed for large US commercial banks as evidence that bank stock holder for a relatively uniform diversification clientele. For firm, marginal benefits from diversification take reductions in the cost of equity funds offered by its specific clientele of stockholders. To maximize the value of the firm these

benefit must be weighted against the explicit and implicit marginal cost of diversification.

The Edward J. Kane and Stephen, a Buser draws following concluding remarks:

-) Even wealthy investors should be sensitive to administrative costs associated with selection, evaluation managing and continually keeping track of a large number of securities.
-) Either home made of firm produced diversification, reduces the variance of shareholders portfolio return. If home made diversification bears in ordinary high levels of information risk, some benefit of form produced diversification might not be reproduce able by individual investors acting on their own.
-) Investors with even modest resources the stock of financial institutions should be relatively lend attractive than the stock of that avoided extensive diversification costs by engaging in specialized activities.

"Regulation of Bank Capital and Portfolio Risk" by Michael Koehn and Anthony M. Santomero in their study examined the portfolio allocation that flows from the portfolio decision of the firm and the effects on bank portfolio risk of a regulatory increase in the minimum capital assets ratio that is acceptable to the supervisory agency. The allocation across assets becomes the choice variable deriving the optimal mean rate of return per unit of the capital and the variance of that return. Therefore, the analysis will be developed in terms of risk and return per unit of capital with no loss in generality. 'According to them, an explicit relationship between the risk of the bank portfolio, the amount of bank capital held and the chance of bankruptcy must, therefore, be obtained to evaluate the result of bank capital regulation.

The Edwin J. Elton in their study names **"Expected return, realized return and asset pricing tests"**, one of fundamental issues is finance in what the factors are that affect expected return on assets, the sensitivity of expected return to those factors, and the reward for bearing this sensitivity. The data set covers the period from July 1, 1991 through December 31, 1997. The history shows almost all the testing is done taking realized return as a proxy for expected return. Using realized

return, as Proxy for expected return is that the unexpected returns are independent, so that as the observation interval increases they tend to a mean of zero.

The purpose of this article is to convince that reader there is a distinction and worth to find out alternative ways to estimate expected returns.

Following preliminary tests are done in the study:

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

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

Mr. Shrestha has expressed his view that the portfolio management activities of Nepalese commercial bank at present are in growing stage. However most of the banks are not doing such activities. So far because of following reason:

-) Unawareness of the clients about the service available.
-) Hesitation of taking risk.
-) Lack of proper technique to run such activates in the best and successful manner.
-) Less developed capital market and availability of few financial instruments the financial market.

Conclusion

The survival of the banks depends upon its own financial health and various activities.

-) The portfolio manager could enhance the opportunity for each investor to each superior return over times.

-) Do not hold any single security.
-) Try to have a diversified investment.
-) Choose such type of portfolio securities which ensure maximum return with minimum risk.

Mr. Shiva Raj Shrestha, Deputy Chief Officer of Nepal Rastra Bank in his study "**Portfolio management" in commercial bank, theory and practice"** by According to him the portfolio management becomes very important for both individuals as well as institutional investors. Investors would like to select a best mix of investment assets subject to following aspect:

- a) Higher return which is comparable with alternative opportunities available according to the risk class of investor.
- b) Certain capital gain.
- c) Flexible investment.
- d) Good liquidity with adequate safety of investment
- e) Maximum tax concession
- f) Economic efficient and effective investment mix.

Following findings have been point out from the research:

- i. To find out the investible asset having scope for better return depending upon individual characteristics like age, health, need, disposition etc.
- ii. To find out the risk of the securities depending upon the attitude of investors towards risk.
- iii. To develop alternative investment strategies for selecting a better portfolio.
- iv. To identify securities for investment to refuse volatility of return and risk.

Sunity Shrestha conducted the study in the title "**Portfolio behaviour of commercial banks in Nepal"**. In this research five commercial banks are taken under study. They are Nepal Bank Ltd., Rastriya Banijya Bank, Nabil Bank, Nepal Indosvez Bank and Nepal Grindlays Bank Ltd. Data are collected from various sources from 1975 to 1990 A.D. The objective of the research was to evaluate the financial performance of the commercial banks; to analyze the investment pattern of commercial banks on securities and loans, to observe the relationship of bank portfolio variables with national income and other fiscal variables. Amount these

objectives financial performance of the commercial banks and observe bank portfolio variables is some how related to this research.

From the analysis of commercial banks, the research has made following conclusion:

-) The general trend commercial banks asset holding is growing.
-) Spread of foreign banks is relatively higher than that of Nepalese banks.
-) The relationship of banks portfolio variables is found to be best explained by log linear equations.
-) Borrowing of commercial banks from the central bank has found to be positively affected by the cash reserve requirement bank rate and Treasury bill rate.

Following suggestion have been points out from the research:

-) The evaluation of the performance of the commercial banks can be made only with reference to the government policy and regulation framework of the central bank.
-) Some of the problems of resource mobilization and resource (development) by the commercial banks in Nepal can be directly traced to the fiscal policy of the government and heavy regulatory procedures of the central bank.

The joint venture between foreign banks and Nepalese banks should be encouraged in Nepal. Specially in merchant and investment banking, leasing and other new creative financial services. The entry of foreign joint venture banks hopefully will bring healthy competition in the environment that will improve work and service efficiency of Nepalese banks too.

The article in web page www.investopedia.com "Are you over diversified" mentioned that many individual investors could not tolerate the short-term fluctuations in the stock market diversifying your portfolio is the best way to smooth out the ride. Diversification is a risk management technique that mixes a wide variety of investments within a portfolio in order to minimize the impact that

any one security will have on the overall performance of the portfolio. Diversification lowers the risk of your portfolio. Academics have complex formulas to demonstrate how this works.

2.3 Review of thesis

Gopal P. Bhatta's (1995) study on "Assessment of the performance of listed companies in Nepal". This research is based on the data of ten listed companies from 1990 to 1995. One of the major objectives of this study is to analyze the performance of listed companies in terms of risk and return and internal rate of return, systematic risk and diversification of risk through portfolio context. The objectives of the research were 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 through portfolio concept. His research methodology was descriptive and analytical and analytical Mr. Bhatta concluded that Nepali investors had not yet practiced to invest in portfolio of securities. An analysis of the two securities portfolio shows that the risk can be totally minimizes if the correlation is perfectly negative. In the situation, the risk can totally be diversified, but when there is perfectly positive correlation ship between the returns of the two securities, the risk is not diversifiable. The analysis shows some has negative correlation and some has positive negative.

Correlation between securities returns is preferred for diversification of the risk. Nepalese capital market is not efficient one. So the stock price doesn't contain all the information relating to market and company itself. Neither investor analyzes the overall relevant information of the stocks nor the member of stocks exchange tries to disseminate the information. Today's market trend has changed from Bull market to bear market investors are being rational.

Mr. Jagdish Basnet's (2002) research entitled "**Portfolio management of joint venture banks in Nepal**" is try to presented data eight year from 1994-2001 A.D. The objective of the research was to find out the situation of the portfolio management of joint venture banks in Nepal. To evaluate the investment and advances portfolio of joint venture banks, to evaluate the financial performance of joint venture banks. To analyze the risk and ratio of commercial banks Mr. Basnet summarized the findings as NBBL, HBL, SCB and EBL was investing very high

amount of its final in government securities. It has providing very high amount of its. Loan and advances to the private sector in increasing trends. It has also given the priority to foreign bills purchase and discount. He analyzed portfolio by only banking industries using secondary data provided by bank. According to him banks are very strong in investment in comparison to individual investors

Roopak Joshi's Study on (2003) "**Investors Problem in Choice of optimum portfolio of stock in Nepal stock exchange**", Mr. Joshi used data of twelve months, fiscal year 2000/2001. The study is based on secondary data published in NEPSE trading report and bank. The objectives of the research were to find out and analyze the major problems of investor facing in the selection of optimum portfolio of security trading in NEPSE. He tries to suggest the majors for the improvement of the stock market as well as for better meet of investors and try to find out the best portfolio of NEPSE. He found that portfolio in new concept in Nepal. The stock market is only in growth stage. The only one stock exchange located in Kathmandu Limited no. of security broker, lack of opportunity to invest, traditional cry system, which is acting as barrier of development of NEPSE. Researcher had taken data of only one fiscal year. He has taken selected and short listed all companies which are categories in "grade A" by NEPSE as his sample size. Due to a lack of financial tools, only three stock portfolios were constructed and analyzed researcher took only three assets portfolio. Mr. Joshi mentioned that due to the lack of sufficient information proper investment was not possible. Proper investment needed huge information internal as well as external. So investor does not know which stock to invest how to portfolio constructed many stockholders do not give the information to the investors; in the pressure of broker investors are purchasing and selling their stock. Small change in stock investment may change the risk and return in very large scale. So investor should have special knowledge and adequate skills. The researcher conclusion is valid only for risk averter investors rather that risk over investor.

In the words Kalpana Khania (2003) entitled "**Investment portfolio analysis of joint venture banks**". The study is based on five joint venture banks and they are NABIL, SCBNL, HBL, NBBL and EBL. The general study of the present study is to identify the current situation of investment portfolio of joint venture banks in Nepal. The objective is to analyze the risk and return ratio of commercial banks, to evaluate the financial performance of joint venture banks in Nepal. The objective

is to analyze the risk and return ratio of commercial banks, to evaluate the financial performance of joint venture banks and portfolio structure of Nabil Bank in investment between loan investment, investment in real fixed assets and investment in financial assets. The major finding of the analysis is Nabil is investing the highest amount of funds on NRB bond as compare to other joint venture bank i.e. 3% beta coefficient of HBL is lowest among all the banks so the systematic risk of HBL is low. The coefficient of correlation between loans and advances in private sector and portfolio return of joint venture banks come out to be $r_{xy} = -0.6$ therefore it indicate that there is negative correlation between loans and advanced in private sector and portfolio return of five joint venture banks in Nepal.

"Portfolio management of commercial banks in Nepal" by Anurodh Shrestha, (2004) meet the stated objectives of the study, descriptive cum analytical research design has been adopted. According to him all the historical closing stock prices of banks, percentage of cash stock dividend, NEPSE index for the seven years (1997 to 2003) including the market capitalization of the banks for 2003 are enumerated. The objective of the research were to evaluate common stock and beta for analysis of systematic risk with common stock priced and identify the range for true beta and true alpha of listed commercial banks under present study in terms of risk and return. The study findings are presented under different sub-headings such as investment, risk and return analysis optimal portfolio etc. He summarized that the investment in single assets is extremely volatile construction of portfolio can diversify such volatility to some extent. Using the tools developed by Sharpe Treynor and Jensen, stocks of the banks in terms of risk and return associated to the stocks have been evaluated in this study. Researcher found that majority of the risk adverse invested fined minimum variance portfolio yielding optimal satisfaction. Single index model of Sharpe had however; identified only three stocks are applicable for the construction of the optimal portfolio. Using the model, the stocks of SBI, HBL and SCB with respective weights of 3%, 68% and 29% are required for construction of the optimal portfolio and the return derived from the same is 58.98% with S.D. of the returns of 61.65%.

Hari Pati Lal Shrestha's (2004) study on **"optimum portfolio investment in Nepal."** The main theme of third study is to analyze rationalizes of portfolio theory in context of Nepalese security market. Always investor tried best to make

sure return, return in not cent percent sure or investment will not ruin. The study mainly focused on the specific sector of market i.e. currently listing in NEPSE for last 6 years and this study mainly based on the companies listed in NEPSE and applied the different categories. His analysis is based on secondary data s well as primary data of 6 years collected by small survey of 25 investors main objectives of this study are to find out and analyze the major problem of investors regarding selection of optimal portfolio, by develop understanding for portfolio investment. He tries to analyze the risk and return market sensitivity, composition of risk and pricing status of securities. And to suggest the measure for the improvement of investment rationalities investor should be aware of risk and return. This research helps them to find out the degree of risk associated with the stock, systematic and unsystematic risk estimation of stock.

2.4 Justification

The research on portfolio management which shows the risk and return analysis of commercial banks identified by the review of literature has justified the need of study. Previous research is not able to find out the risk and return analysis of using cross sectional data of previous seven years. This research is full try to show the real optimal portfolio management of sampled commercial banks with the help of simple Sharpe portfolio/ optimization.

CHAPTER -3

RESEARCH METHODOLOGY

Research methodology described the method and process applied in the entire subject of the study. On the basis of historical data, using both statistical tools and financial tools, detail analysis is performed of different variables. It is the plan, structure strategy of investigation conceived to answer the research question or list the research hypothesis. Research design is used to control variance. Detailed research methods are describes below:

3.1 Research Design:

This research is based on recent historical data of last nine years. The end of the fiscal year is taken as 16 July and the data range is from 16 July 1997 to 16 July 2006. Data analysis is divided into two parts 1st generation bank (whose incorporation year after 1993) and 2nd generation bank (whose incorporation year after 1993) by using cross sectional data. The research is mainly focused on expected risk and return and portfolio risk and return management of the listed commercial banks in NEPSE. To achieve objective of the study, descriptive cum analytical research design has been adopted.

3.2 Data collection procedures:

Under the study of investment portfolio analysis of Nepalese Commercial Banks data used in the research are secondary sources i.e. published/ unpublished written document, e.g. books, journals available in the library and Annual report of NEPSE, website of NEPSE and NRB are used as secondary data.

3.3 Sample

One listed and specific commercial banks in Nepal Stock Exchange are selected sample bank for the analysis. They are:

1. Nabil Bank Ltd.

Nabil bank is the first joint venture commercial banks in Nepal , which was established in 1984 A.D.and listed in NEPSE 1986 A.D.Currently Nabil bank is joint venture with national bank ltd of Bangladesh. Nabil provides a full range of commercial banking services through its outlets spread across the nation and reputed correspondent banks across the globe . Authorized capital issued capital and paid up capital of Nabil bank are Rs.500000000, Rs.491654400, Rs.491654400 respectively . It has 5076 number of shareholders outstanding and currently fifteen branches and two counters working around the country.

2. Nepal Investment Bank Ltd.

Nepal Investment Bank Ltd. is the third joint venture bank in Nepal . It was established on 21st Jan.1985 A.D.It is listed in NEPSE in 1987 A.D.NIB's authorized ,issued and paid up capital are Rs. 590000000, Rs.295293000 and Rs.255293000 respectively . It has 2780 number of shareholder outstanding and currently five branches working around the country .

3. Standard Chartered Bank Ltd.

Standard Chartered Bank Ltd. is the second joint venture bank in Nepal . It is formally known as Grindlays bank ltd.Initially SCB was joint venture with ANZ Grindlays bank PLC and later SCB joint venture with standard chartered bank, England . SCB's is established in the year 1985 A.D.and listed in NEPSE at 1988 A.D. SCB's authorized ,issued and paid up capital are Rs.339548800, Rs. 339548800 and Rs.339548800 respectively. It has 5037 number of shareholders outstanding and currently ten branches working around the country.

4. Himalayan Bank Ltd.

Himalayan bank Ltd. was established in the year 1992 A.D. Joint venture with Habib bank Ltd. of Pakistan . HBL's listed date is 1993 A.D. It is the first commercial bank of Nepal with maximum share holding by the Nepalese private sector. Beside commercial activities, the bank also offers industrial and Merchant banking.HBL's authorized, issued and paid up capital are Rs.

1000000000, Rs. 650000000 and Rs. 429000000 respectively. It has 7210 number of shareholders outstanding and the bank at present has five branches working around the country, besides it has nine branches outside Kathmandu valley.

5. Nepal SBI Bank Ltd.

Nepal SBI Bank Ltd is the joint venture bank of state bank of India and it was incorporation in 1993 A.D. under company act. SBI was listed in NEPSE in 1994 A.D. SBI's authorized, issued and paid up capital are Rs. 1000000000, Rs. 500000000 and Rs. 425157300 respectively. It has 20589 numbers of shareholders outstanding and currently eleven branches working around the country.

6. Nepal Bangladesh bank Ltd.

Nepal Bangladesh bank Ltd. was established in 1994 A.D. It was listed in NEPSE in 1995 A.D. It is the joint venture bank with IFIC bank Ltd. NBBL's authorized, issued and paid up capital are Rs. 1000000000, Rs. 500000000 and Rs. 359924500 respectively. It has 24598 numbers of shareholders with a network of seventeen branches and a corporate office; the bank commands the largest network amongst the joint venture commercial bank in Nepal.

7. Everest bank Ltd.

Everest bank Ltd. was established in 1993 A.D. with the joint venture of Punjab National Bank Ltd. India. It was listed in NEPSE in 1995 A.D. EBL's authorized issued and paid up capital are Rs. 750000000, Rs. 465000000 and Rs. 455000000 respectively. It has 24222 numbers of shareholder outstanding and currently twelve branches working around the country.

8. Bank of Kathmandu Ltd.

Bank of Kathmandu Ltd. was established in 1994 A.D. with joint venture with commercial bank PCC, Thailand. This is a latest joint venture bank in NEPSE and it was listed in 1998 A.D. BOK's authorized, issued and paid up capital are Rs. 1000000000, Rs. 500000000 and Rs. 463580900 respectively. It has 23306

numbers of shareholders outstanding and currently seven branches are operating around the country.

3.4 Tools and techniques for analysis

Market Price of Stock (MPS):

There are mainly three types of MPS available in NEPSE annual report. They are high MPS, low MPS and closing MPS. Closing price is not an average price of high and low MPS but rather it is calculated by considering the whole years MPS. For the closing MPS trading report is followed.

Dividend (D):

Dividend can be given in the form of cash or shares. If the company declare dividend in cash then there is no difficulty in calculation. But if the company declares stock dividend or bonus share then shareholders get shares as dividend instead of cash. So there is title difficult to calculate the exact amount in cash. In case of stock dividend the formula for total dividend amount is considered as follows:

Total dividend = DPS + next year's closing * stock dividend %

Single period rate of return (R):

This is the annual realized return received on an investment and any change in market price, usually expressed in a percent of the beginning price of the investment. It is the summation of the dividend yield and the capital gain yield.

Symbolically,

$$R = \frac{D_t + \Gamma(P_t - P_{t-1})}{P_{t-1}}$$

Where,

R= Actual realized return on common stock at time t.

D_t = Cash dividend received at time t.

P_t = Price of a stock at time t.

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

Expected rate of return on common stock [$\bar{y}(R_j)$]

Expected return is simply arithmetic mean of the past years return. This is an average return on common stock.

Symbolically,

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

Where,

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

N = Number of years

\sum = Sign of summation

Standard Deviation (σ_j)

Standard deviation is a statistical measure and is widely used to measure risk from holding a single asset. The standard deviation represents a large dispersion of return and is a high risk and vice versa.

Symbolically,

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

Where,

σ_j = Standard deviation of returns on stock j. During the time period n.

Coefficient of Variation (C.V.):

Coefficient of variation is the ratio of the standard deviation of a distribution to the mean of that distribution. It is a measure of relative risk.

Symbolically,

$$\text{Coefficient of variation } C.V. = \frac{\sigma}{\bar{R}}$$

Covariance (Cov):

Co-variance is the joint variance of two securities. It measures how two random variables, such as the return on security A and B move together. A positive value of covariance indicates that the securities returns tend to move in the same direction. A negative value of covariance indicates the return of securities move in the opposite direction and the zero value of covariance indicates no relationship between the securities return. It is the product of different deviation divided by the number of observations.

Symbolically,

$$Cov_{jm} = \frac{\sum (R_j - \bar{R}_j) (R_m - \bar{R}_m)}{n}$$

Where,

$$Cov_{jm} = \text{Covariance between security } j \text{ and } m.$$

Beta Coefficient (β_j):

Beta is an index of systematic risk. It measures how much systematic risk a stock j has relative to market portfolio.

Symbolically,

$$\beta_j = \frac{Cov(R_j, R_m)}{Var(R_m)}$$

Where,

$$\beta_j = \text{Beta coefficient of stock } j.$$

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

Beta of market return equals to 1. If beta is greater than 1, then the assets is more volatile than market and is called aggressive beta. If the beta is less than 1, the

asset is called defensive beta and its price fluctuation is less volatile than market. (Bhattacharai; 2004; 122)

Capital Assets Pricing Model (CAPM):

Capital Assets Pricing Model describes the relationship between risk and required return. A security's expected return is the risk-free rate plus a premium based on the systematic risk of the security.

Symbolically,

$$\overline{R_j} = R_f + [\beta_j (R_m) - R_f]$$

Where,

$\overline{R_j}$ = the expected return on the j^{th} risky assets.

R_f = the rate of return on a risk less assets.

(R_m) = the expected return on the market portfolio.

$$\beta_j = \text{Cov}(R_i, R_m) / \text{Var } R_m$$

= A measure of the undiversifiable risk of the j^{th} security.

Systematic risk

Systematic risk is known as the undiversifiable risk. The risk is those portions of total variability in return caused by market factor that simultaneously affect the price of all securities.

$$\text{Systematic risk} = \beta_j^2 \sigma_m^2$$

Where,

β_j^2 = Beta coefficient of security

σ_m^2 = Variance of market

Unsystematic risk

Unsystematic risk is also called diversifiable risk. This type of risk is unique to an organization and can be largely eliminated by holding a diversified portfolio on investment.

Symbolically,

Unsystematic risk = Total risk – Systematic risk

Or,

$$\text{Var}(e) = \sigma_j^2 - \beta_{jm}^2 \sigma_m^2$$

Where,

Var. (e) = Variance of standard error.

Portfolio Return (Rp)

It is the weighted average returns of the stocks in the portfolio of two or more securities.

Symbolically,

$$R_p = W_1 \bar{R}_1 + \dots \dots \dots W_n \bar{R}_n$$

R_p = Expected return of the portfolio

W₁ = Weight of stock 1

R₁ = Expected return of stock 1

W_n = Weight of stock n

R_n = Expected return of stock n.

Portfolio standard deviation (σ_p)

It is the combined standard deviation of the individual stocks return in the portfolio of two or more securities.

Symbolically,

We have,

$$\sigma_p^2 = (W_1^2 \sigma_1^2 + W_2^2 \sigma_2^2 + 2W_1W_2COV_{12})$$

Where,

σ_p^2 = Variance of the portfolio returns of stock

W_1^2 = Weight of returns of stock 1.

Cov_{12} = Covariance between returns of stock 1 and 2.

Cut of Rate:

The cut of rate gives the number of securities that can be added to construct the optimal portfolio.

Symbolically,

$$C_j = \frac{\sigma_m^2 (R_j - R_f) \beta_j}{\sigma_{ei}^2} \frac{1}{1 + \beta_j \frac{\sigma_j^2}{\sigma_{ei}^2}}$$

Where,

C^* = Select cut of rate

R_j = Expected return of Stock j

R_f = Risk free rate of return

β_j = Beta of Stock j

σ_{ei}^2 = Unsystematic risk of stock j.

σ_m^2 = Variance of the market index.

CHAPTER -4

PRESENTATION AND ANALYSIS OF DATA

This chapter included analysis of collected data and their presentation. Detail data of dividend of each bank and relevant data of NEPSE index is presented and their interpretation and analysis is done. Secondary data is taken as an analysis of data. Secondary data is the data collected from secondary sources to make this research more understanding. Most of the data are presented in a tabular form with appropriate figures.

Risk and Return analysis

A major purpose of investment is to get a return or income on the funds invested. The expected rate of return of holding period return is based upon the expected cash receipt over the holding period and the expected ending or selling price. The possible rates of return estimated by the investor are summarized in an expected rate of return. The expected rate of return of must be equal or greater to the required rate of return.

Standard deviation is used to measure an associated risk of the securities. The high standard deviation represented a large dispersion of return and is a high risk and a low standard deviation is a small dispersion and represented a low risk. Coefficient of variation measured on the base of risk per unit. It shows the risk per unit of return and it provided a more meaningful basis for comparison when the expected return on two alternatives is not the same.

4.1 Cross sectional data

1st Generation Bank

(A) In this part individual banks is combined together (whose incorporation year before 1993) and analyze the comparative analysis of risk and returns in performed here:

Table 4.1

Expected return (\bar{R}), Standard Deviation (Ξ), Coefficient of variation (C.V.) of
NABIL, NIB, SCB, HBL, EBL (in corporation year before 1993)

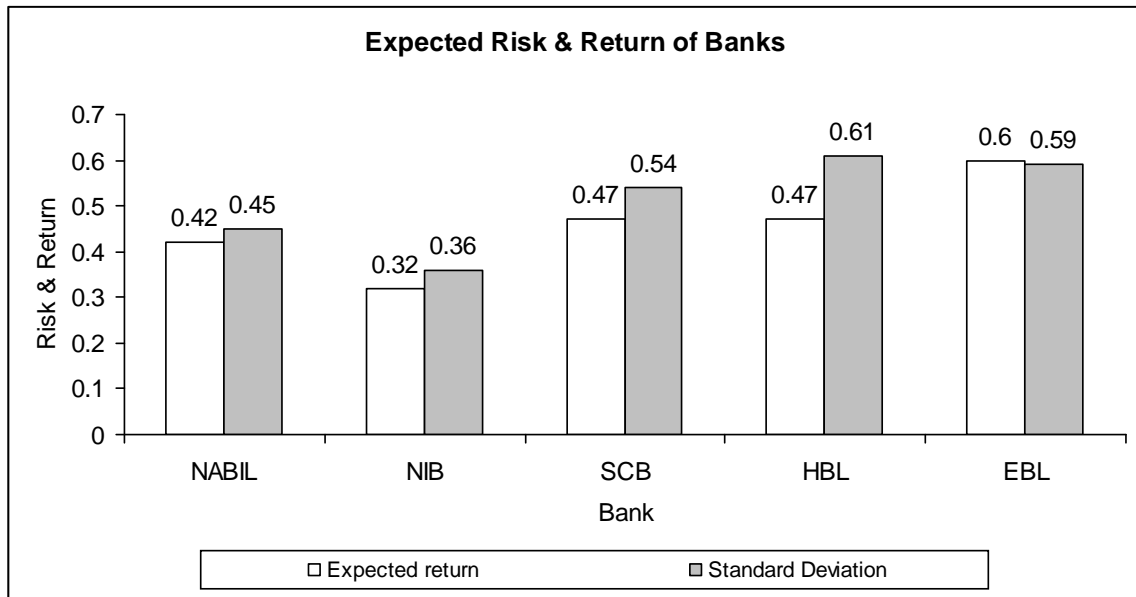
Fiscal year	NABIL	NIB	SCB	HBL	EBL	Total	\bar{R}	S.D.	C.V.
16 July, 1997	-	-	-	-	-	-	-	-	-
16 July, 1998	0.62	0.48	0.42	0.26	0.45	2.23	0.45	0.13	0.29
16 July, 1999	0.74	0.42	1.66	1.74	1.29	5.85	1.17	0.57	0.49
16 July, 2000	1.08	0.73	0.79	1.13	1.41	5.14	1.03	0.27	0.26
16 July, 2001	0.23	0.36	0.13	0.05	0.20	0.97	0.19	0.12	0.63
16 July, 2002	-0.49	-0.34	-0.23	-0.15	-0.43	-1.64	-0.33	0.14	-0.42
16 July, 2003	0.07	0.57	0.13	-0.08	0.43	1.12	0.22	0.26	1.18
16 July, 2004	0.45	0.20	0.27	0.28	0.57	1.77	0.35	0.15	0.43
16 July, 2005	0.58	-0.14	0.41	0.37	0.28	1.50	0.30	0.27	0.90
16 July, 2006	0.54	0.6	0.67	0.61	1.17	3.59	0.72	0.25	0.35
16 July, 2007	?	?	?	?	?	?	?	?	?
Total	3.82	2.88	4.25	4.21	5.37	20.53	4.10	2.16	4.11
\bar{R}	0.42	0.32	0.47	0.47	0.60	2.28	0.46		
S.D.	0.45	0.36	0.54	0.61	0.59	2.55	-	0.46	1.00
C.V.	1.07	1.13	1.15	1.30	0.98	5.63			

Source: See detail analysis in annex 1 and 2

According to this table the expected rate of return of basis NABIL, NIB, SCB, HBL and EBL were 0.42, 0.32, 0.47, 0.47, and 0.60 respectively. Investor expected to get highest return from EBL (i.e. 60%) and lowest return from NIB (i.e. 32%). EBL stock is profitable among the stocks. Standard deviation of HBL is highest and standard deviation of NIB is lowest.

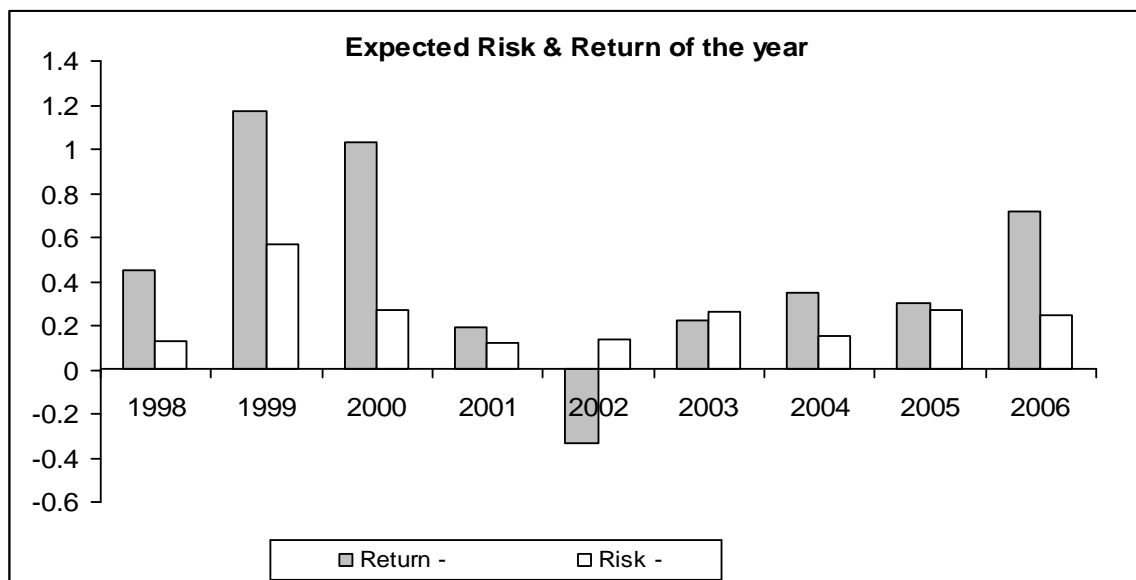
Coefficient of variation (C.V.) reveals risk per unit of return and provided better possible valued for risk C.V. can define as average return dividend by standard deviation. It is computed to measure risk in relative term. Higher C.V. exposed higher risk and vice versa. C.V. defined that one unit change in risk will change 1.07, 1.13, 1.15, 1.30 and 0.98 unit change in the return of NABIL, NIB, SCB, HBL, EBL respectively. EBL in the best security on the base of coefficient of variation.

Figure 4.1



Above graph presents that the EBL is providing high return for bearing more risk, HBL, SCB and NABIL are providing high risk with moderate return for the risk seeker investor. HBL is the best alternative and EBL is the best securitized for risk averter to invest.

Figure 4.2



In the comparison of fiscal year the expected rate of return ranged from 0.45 to 1.17. Above graph presented that highest expected rate of return (1.17) in the year

1999 among the sample. In the year 2002, it has negative return due to decrement in the marked value of the share. On the base of return 1999 is the best year. Standard deviations of the year 1997 to 2006 are ranged from 0.12 to 0.57. It showed that year 1999, is the highest risky year in comparison of other year.

The decision taken on the base of risk and return separately is not rational decision. Coefficient of variation is the best measure to make investment decision.. One unit change in risk will change 0.29, 0.49, 0.26, 0.63 , -0.42, 1.18, 0.43, 0.90 and 0.35 unit change in the return of 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005 and 2006 respectively. From the analysis, It is easy to interpret that more the risk more will be the return.

2nd Generation Bank

(B) In third part individual bank is combined together (whose incorporation year after 1993) and analyze the comparative analysis of return and risk is performed here.

Table 4.2

Expected return (\bar{R}), Standard Deviation (Ξ), Coefficient of Variation (C.V.) of SBI, NBBL, BOK (in corporation year after 1993)

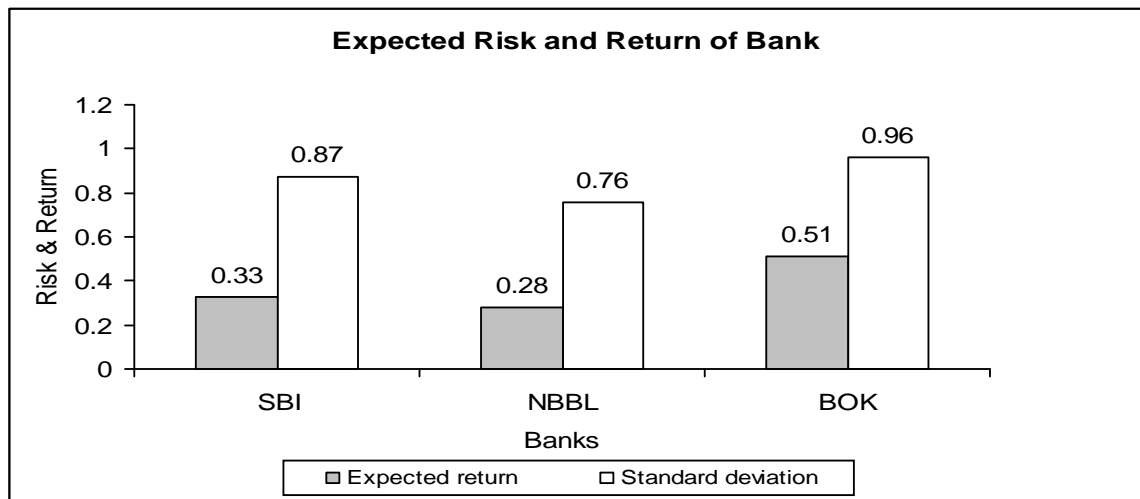
Fiscal year	SBI	NBBL	BOK	Total	\bar{R}	S.D.	C.V.
16 July, 1997	-	-	-	-	-	-	
16 July, 1998	0.12	0.75	-	0.87	0.29	0.40	1.37
16 July, 1999	0.30	1.51	0.91	2.72	0.91	0.60	0.66
16 July, 2000	0.03	1.44	2.62	4.09	1.36	1.30	0.96
16 July, 2001	2.38	0.08	-0.15	2.31	0.77	1.40	1.82
16 July, 2002	-0.65	-0.45	-0.69	-1.79	-0.60	0.13	-0.22
16 July, 2003	-0.34	-0.29	-0.20	-0.83	-0.28	0.07	-0.25
16 July, 2004	0.20	-0.19	0.54	0.55	0.18	0.37	2.06
16 July, 2005	0.09	-0.09	0.51	0.51	0.17	0.28	1.65
16 July, 2006	0.84	-0.25	1.02	1.61	0.54	0.69	1.28
16 July, 2007	?	?	?	?	?	?	?
Total	2.97	2.51	4.56	10.04	3.34	5.24	9.33
\bar{R}	0.33	0.28	0.51	1.12	0.37		
S.D.	0.87	0.76	0.96	2.59		0.60	1.62
C.V.	2.64	2.71	1.88	7.23			

Source: See detail analysis in annex 1 and 2

According to the table expected rate of return of banks SBI, NBBL and BOK were 0.33, 0.28 and 0.51 respectively. Investors expect to get highest return from BOK (i.e., 51%) and lowest return from NBBL (i.e. 28%), BOK stock is profitable among the stocks on the base of return.

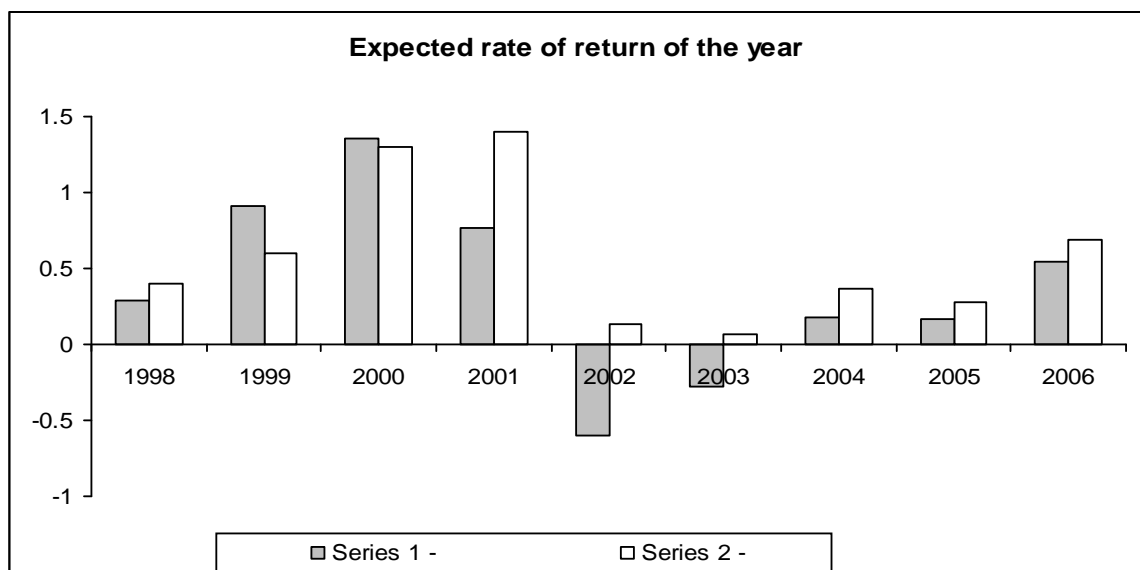
C.V. of HBBL is higher among the securities this denotes that one unit change in the risk will change 2.64, 2.71 and 1.88 unit change in the return of SBI, NBBL and BOK respectively. BOK is the best security on the base of coefficient of variation.

Figure 4.3



Above graph presents that the BOK has the highest risk (S.D.) BOK is providing high risk with high return among the banks.

Figure 4.4



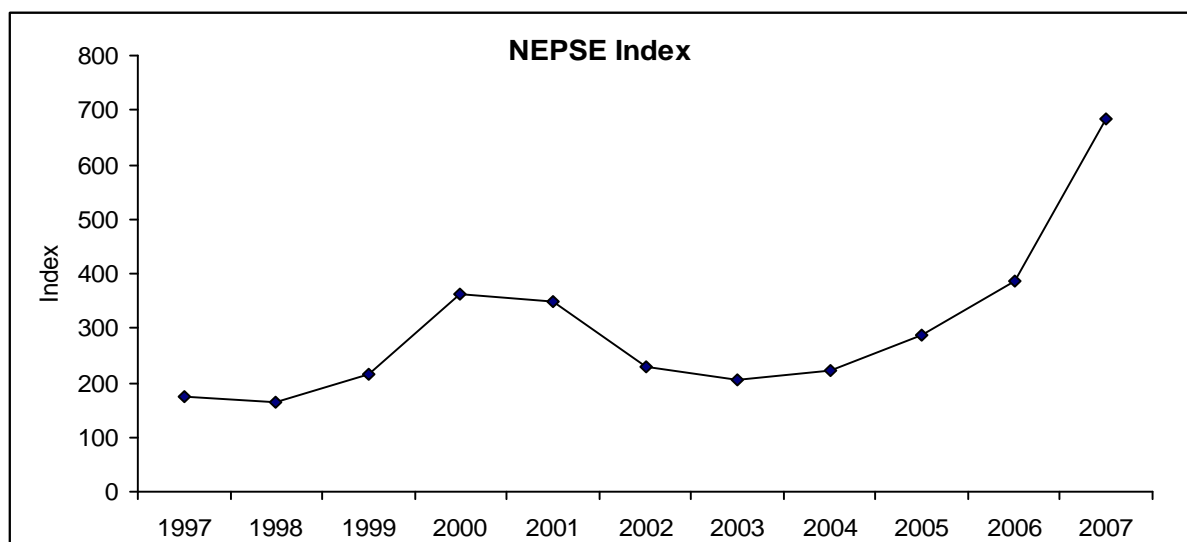
In the comparison of fiscal year the expected rate of return ranged from -0.60 to 1.36. Above graph presented that highest expected rate of return (1.36) in the year 2000 among the sample. So the year 2000 in the best year for the risk lover investor who become ready to face high risk in the hope of high return. In the year 2002 and 2003, it has negative return due to decrement in the market value of the share. On the base of return 2000 is the best year. Standard deviations of the year 1997 to 2006 are ranged from 0.07 to 1.40. It showed that year 2001, is the highest risky year in comparisons of other year.

The decision taken on the base of coefficient of variation is the best measure to make investment decision. One unit change in risk will change 1.37, 0.66, 0.96, 1.82, -0.22, -0.25, 2.06, 1.65 and 1.28 unit change in the return of 1998, 1999, 2001, 2002, 2003, 2004, 2005, 2006 respectively.

4.2 Analysis of Market Risk and Return:

Nepal Stock Exchange (NEPSE) is the only secondary stock market in Nepal and overall market index is represented by NEPSE. Market risk and return are the most return are the most important factors to analyze the risk and return of individual stocks following is the calculation of market return, standard deviation and coefficient of variation of NEPSE from 1997 to 2006.

Figure 4.5



The NEPSE index range from 163 to 387 during research period, the index was decrease in the year 1998 and increased in the year 1999 to 2000 and again started

to decrease from 2001 and 2003 and re-again started to increase in the year 2003 to 2006.

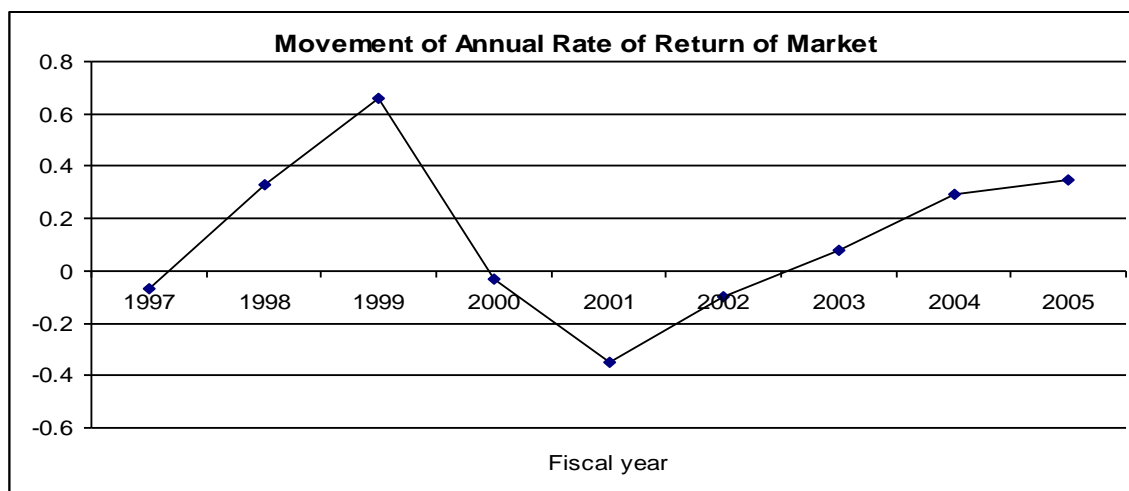
Table 4.3

Expected Return (\bar{R}), Standard deviation (Ξ), Coefficient of Variation (C.V.) and Variance of the Market

Fiscal year	NEPSE Index Ni	$R_m = \frac{NI_t \Gamma(NI_t, ZNI_{tZt})}{NI_{tZt}}$	$R_m - \bar{R}_m$	$(R_m - \bar{R}_m)^2$
16 July, 1997	176	-	-	-
16 July, 1998	163	-0.07	-0.20	0.04
16 July, 1999	217	0.33	0.20	0.04
16 July, 2000	361	0.66	0.53	0.28
16 July, 2001	348	-0.03	-0.16	0.03
16 July, 2002	228	-0.35	-0.48	0.23
16 July, 2003	205	-0.10	-0.23	0.05
16 July, 2004	222	0.08	-0.05	0.003
16 July, 2005	287	0.29	0.16	0.03
16 July, 2006	387	0.35	0.22	0.05
16 July, 2007	684 ?	?	?	?
Total		1.16		0.75
\bar{R}	0.13			
S.D.	0.30			
Var.	0.09			
C.V.	2.31			

Data Source: NEPSE

Figure-4.6



The return of market is negative in first year. The rate of return was increased up to 33% and it is double in the year 2002. And the rate of return is started to decrease and went below up to -10%.

The market changed bull market to bear market. Table 3 show the market expected return i.e., only 13% where as it's standard deviation is 30%. And coefficient of variation is 2.31 times.

4.3 Analysis of Market Sensitivity

In this research beta coefficient is taken as the measurement of market sensitivity. Higher the beta higher will be the market sensitivity and higher will be the reaction to the market movement. Beta coefficient represented systematic risk of particular assets relative to the market. It is the key element of the CAPM. Beta measured non-diversifiable risk. Beta shows how the price of a security responds to market forces. Market sensitivity looks how sensitive are stocks returns to the average market returns by looking at the percentage change in stock and market return during the same period. The following tables show the beta coefficient of each bank.

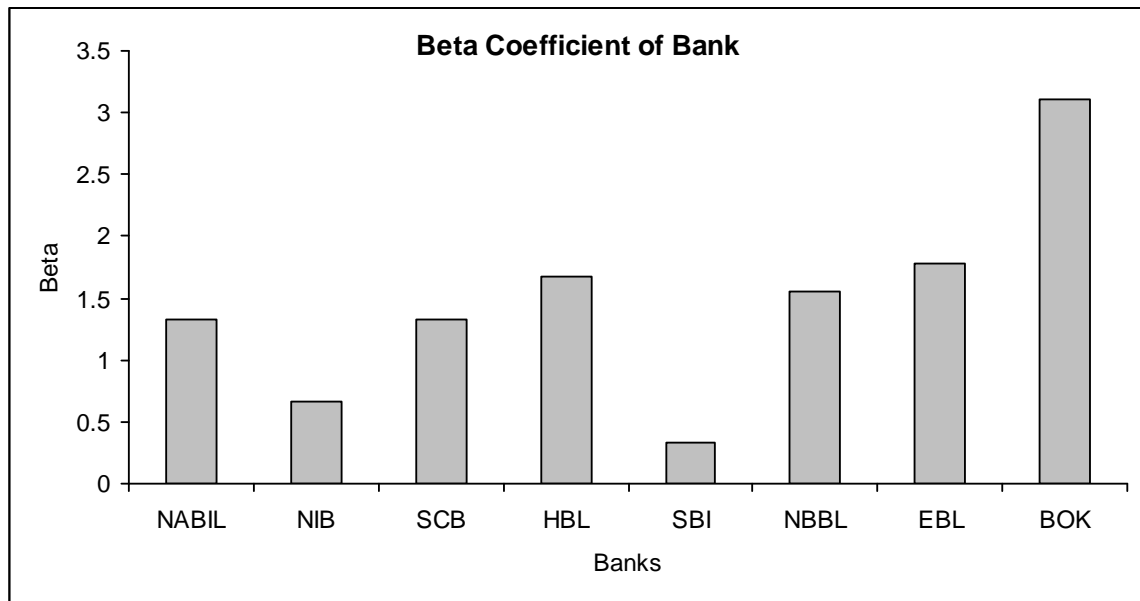
Table 4.4
Beta coefficient of bank

S.No.	Banks	Beta ()
1	NABIL	1.33
2	NIB	0.67
3	SCB	1.33
4	HBL	1.67
5	SBI	0.33
6	NBBL	1.56
7	EBL	1.78
8	BOK	3.11

Source: See detail analysis in Annex 3

The beta of NABIL, NIB, SCB, HBL, SBI, NBBL, EBL and BOK is 1.33, 0.67, 1.33, 1.67, 0.33, 1.56, 1.78 and 3.11 respectively.

Figure 4.7
Beta coefficient of Bank



■ Beta coefficient

According to the diagram, all the beta coefficient of banks is positive. Only beta of NIB and SBI bank is less than 1. Which means the bank is running under low risk from the calculation it shows that the beta of BOK is the highest that is 3.11 that means the stock of BOK is highly sensitive with the market return.

4.4 Systematic and Unsystematic Risk

Systematic risk is the portion of the total risk of an individual security caused by market factor that simultaneously affect the prices of all securities. It can't be diversified away. It is also called market risk or Unavoidable risk or beta risk.

Unsystematic risk is the portion of total risk that can be diversified away. It is also called non-market risk or avoidable risk or diversifiable risk.

Table -4.5
Calculation of systematic and unsystematic risk

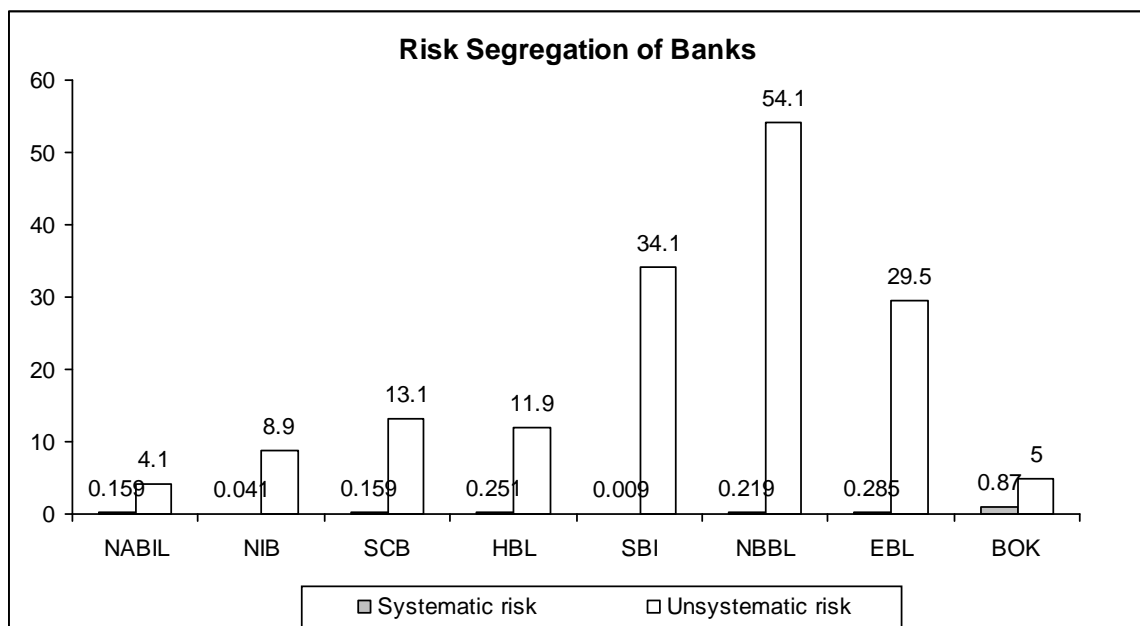
Bank	Total Risk	Systematic risk	Proportion	Unsystematic risk	Proportion
NABIL	4.26	0.159	3.732	4.1	96.24
NIB	8.94	0.041	0.458	8.9	99.55
SCB	13.26	0.159	1.199	13.10	98.79
HBL	12.15	0.251	2.066	11.9	97.94
SBI	34.11	0.009	0.026	34.10	99.97
NBBL	54.32	0.219	0.403	54.1	99.59
EBL	29.79	0.285	0.956	29.5	99.02
BOK	5.87	0.870	14.82	5	85.17

Source: See detail analysis in Annex 4.

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

The systematic risk of NABIL, NIB, SCB, HBL, SBI, NBBL, EBL and BOK are 0.159, 0.041, 0.159, 0.251, 0.009, 0.219, 0.285 and 0.870 and unsystematic risk of NABIL, NIB, SCB, HBL, SBI, NBBL, EBL and BOK are 4.1, 8.9, 13.10, 11.9, 34.10, 54.10, 29.5 and 5 respectively. This shows that BOK has highest systematic risk and NBBL has highest unsystematic risk.

Figure 4.8



The proportion of systematic risk of NABIL, NIB, SCB, HBL, SBI, NBBL, EBL and BOK are 3.732, 0.458, 1.199, 2.066, 0.026, 0.403, 0.956 and 14.82% and the portion of unsystematic risk are 96.24%, 99.55%, 98.79%, 97.94%, 99.97%, 99.59%, 99.02% and 85.17% respectively. Systematic risk cannot be diversifiable. The proportion of risk of SBI is 99.97% it denotes that all the risk of banks can be diversifiable. In the same way, proportion of systematic risk of BOK has highest i.e. 14.82% which indicates that, company will be pity to improve its performance.

4.5 Analysis of Required Return

Investors should know whether the capital they are investing in safe or not. Study of required rate of return is necessary for investors before investing. The following table shows the required return of each bank.

Table 4.6
Analysis of required expected return of each bank

Bank	R_m	R_f	$R_m - R_f$	Beta ()	Required Return
NABIL	0.13	0.0298	0.1002	1.33	0.16
NIB	0.13	0.0298	0.1002	0.67	0.10
SCB	0.13	0.0298	0.1002	1.33	0.16
HBL	0.13	0.0298	0.1002	1.67	0.20
SBI	0.13	0.0298	0.1002	0.33	0.06
NBBL	0.13	0.0298	0.1002	1.56	0.19
EBL	0.13	0.0298	0.1002	1.78	0.21
BOK	0.13	0.0298	0.1002	3.11	0.34

Source: Website of Nepal Rastra Bank

The SML equation in developed as:

$$R_j = R_f + (R_m - R_f) \beta_j$$

(Note: Average annual interest rate of Treasury bills of 91 days is taken on risk free rate).

Required expected return is calculated using capital assets pricing model (CAPM). Capital assets pricing model describes the relationship between risk and required

return. In this calculation risk free rate is taken as government securities (Treasury bills of 91 days annual interest rate has been taken) from the calculation, BOK needs higher required rate of return than other banks by 34% while, SBI needs lowest required return of 6%.

4.6 Comparison of Required return with expected return:

Criteria for rating the securities over valued and under valued are defined by CAPM or security market line (SML) security marked line helps distinguish whether the stocks are overpriced or under priced. It shows the relationship between the measures of systematic risk, and the required return of an asset. The line sloped upward confirms that investors are risk average the higher the risk, higher the risk, the higher the required return.(V.K. Bhalla, 2051: 561)

The SML equation is developed as,

$$R_j = R_f + (R_m - R_f) \beta_j$$

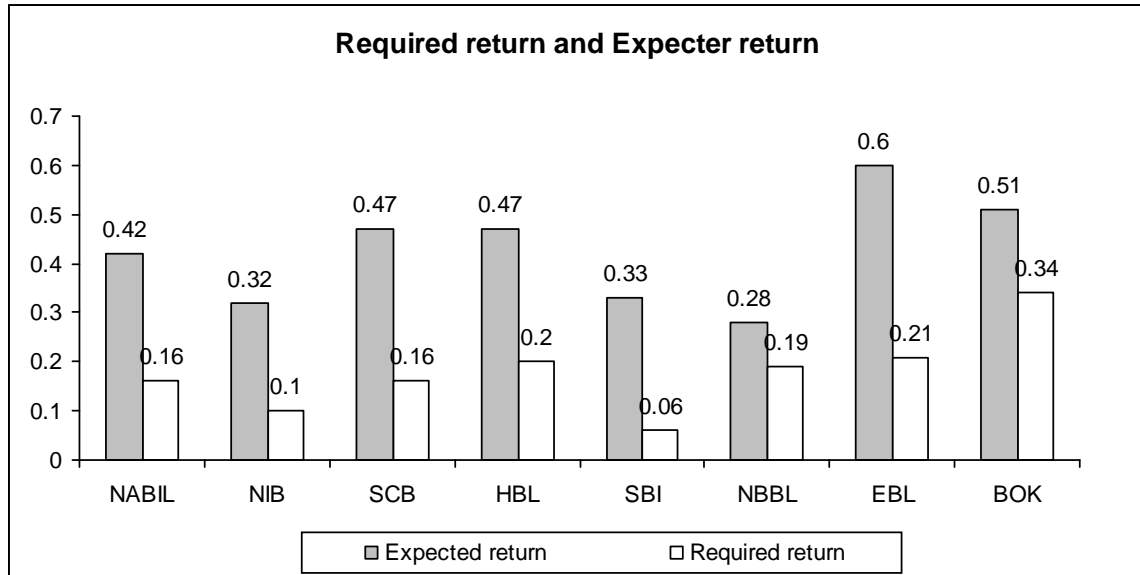
Table 4.7
Comparison of required return with expected return

Bank	Beta ()	Expected return	Required return (T.B.rate)	Remarks
NABIL	1.33	0.42	0.16	Under valued
NIB	0.67	0.32	0.10	Under valued
SCB	1.33	0.47	0.16	Under valued
HBL	1.67	0.47	0.20	Under valued
SBI	0.33	0.33	0.06	Under valued
NBBL	1.56	0.28	0.19	Under valued
EBL	1.78	0.60	0.21	Under valued
BOK	3.11	0.51	0.34	Under valued

The required rate of return and expected rate of return of NABIL, NIB, SCB, HBL, SBI, NBBL, EBL and BOK are (0.16, 0.42), (0.10, 0.32), (0.16, 0.47), (0.20, 0.47), (0.06, 0.33), (0.19, 0.28) (0.21, 0.60) and (0.34, 0.51). Using the model, the above table shows all the banks are under valued because their equilibrium return is less

then their expected return and all the banks are earning more than required return. When we used risk free rate as Treasury bills BOK needs higher required return of 34% because it was earning at high risk while SBI needs lowest required return of 6% because its beta coefficient is less than 1.

Figure 4.9



In the above graph, it is clearly that the expected rates of return of all the banks are higher then required rate of return. It denoted that holder of the security is ready to pay its current price at his required rate of return.

4.7 Portfolio risk and return

Risk and return are based on the investment of single assets. Investor had constructing a portfolio to minimize risk and increase its return. 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 securitized? Which banks securitized is more risky to comparing with each other? Constructing of portfolio or making an investment in more then one asset which are negatively correlated can reduce unsystematic risk without loosing any return.

The analysis is based on two security portfolio. The expected return on a portfolio $E(rp)$ is simply the weighted average of the expected return on the individual

assets in the portfolio with the weight being the fraction of the total portfolio invested in each asset.

"The expected return of the portfolio is the weighted average of the expected returns of the individual assets in the portfolio. The weights are proportion of the investors wealth invested in each assets and sum of the weights must be equal one." (Cheney John. M and Edward A. Mosed n. d; 652)

$$(\bar{R}_p) = \epsilon_1 \times \bar{R}_1 + \epsilon_2 \times \bar{R}_2$$

Where,

$E(rp)$ = Expected rate of return from the i^{th} asset

ϵ_1 = Fraction of the total value of the Portfolio invested in the i_{th} assets.

(The sum of the ϵ_1, ϵ_2 should be 1 or 100%)

"The portfolio risk is affected by either variance of return as well as the covariance between the returns of individual assets included in the portfolio and respective weights. (Pradhan 1992:295)

Expected risk on a portfolio is a function of the proportion invested in the components, the riskiness of the component and correlation of returns on the component securities. It is measured by standard deviation and calculated by using this formula.

We have,

$$\dagger_p = \sqrt{\check{S}_1^2 \cdot \dagger_1^2 + \Gamma \check{S}_2^2 \dagger_2^2 + \Gamma 2 \check{S}_1 \check{S}_2 Cov_{12}}$$

Where,

\dagger_1 = Standard deviation of security 1

\check{S}_1 = Proportion of the Portfolio denoted by security 1.

Cov_{12} = Covariance between the security 1 and 2.

Table-4.8
Calculation of Portfolio risk and return:

\tilde{S}_{BI}	\tilde{S}_B	\bar{R}_p	\dagger_p
1	0	0.46	0.46
0.90	0.10	0.38	0.42
0.80	0.20	0.31	0.40
0.70	0.30	0.26	0.39
0.60	0.40	0.22	0.41
0.50	0.50	0.21	0.41
0.40	0.60	0.20	0.44
0.30	0.70	0.22	0.47
0.20	0.80	0.25	0.50
0.10	0.90	0.30	0.54
0	1	0.37	0.60

Source: See detail analysis in annex 5 and 6.

In this table, the optimal portfolio return is 46% at the 100% weight of 1st generation bank and 0% weight of 2nd generation bank. And the return on portfolio is 0.38, 0.31, 0.26, 0.22, 0.21, 0.20, 0.22, 0.25, 0.30 and 0.37 respectively at the weight of 0 to 100% of 1st generation bank and 2nd generation bank.

Similarly, Highest Portfolio risk i.e. 60% and lowest portfolio risk is 39% respectively.

$$\begin{aligned}
 W_{BI} &= \frac{\dagger_{BI}^2 ZCovBI, BII}{\dagger_{BI}^2 \Gamma \dagger_{BI}^2 Z2CovBI, BII} \\
 &= \frac{0.36 Z0.232}{0.212 \Gamma 0.36 Z2 | 0.232} \\
 &= \frac{0.128}{0.572 Z0.464} \\
 &= \frac{0.128}{0.108} \\
 &= 1.19
 \end{aligned}$$

$$\begin{aligned}
W_{BII} &= 1 - W_{BI} \\
&= 1 - 1.19 \\
&= -0.19
\end{aligned}$$

Where,

W_{BI} = Optimal weight to invest in 1st generation bank

W_{BII} = Optimal weight to invest in 2nd generation bank

Since, $W_{BI} = 1.19$ and $W_{BII} = 0.19$. This result indicates that, if the investor wanted to minimize risk, it would have to invest 119% or more than 100% of its capital in 1st generation bank that means NABIL, NIB, SCB, HBL and EBL.

4.8 Single Index Model

4.8.1 Simple Sharpe portfolio optimization

Single index model for optimal portfolio enable to find out the securities to be in optimal portfolios. In this case the desirability of including a stock directly related to its excess return to beta ratio. If the stocks ranked by excess return to beta for highest to lowest the ranking represents the desirability of any stocks inclusion in a portfolio. The no. of stocks selected depends on a unique cut off rate, such that all stocks with higher return to beta ratio will include and all the stocks will lower ratios will exclude.

Table 4.9
Calculation of excess return to beta ratio:

Banks	Mean Return (R_i)	Excess Return ($R_i - R_f$)	Beta ()	Unsystematic Risk (σ_{ei}^2)	Excess return over beta ($(R_i - R_f) / \beta$)	Rank
SBI	33	30.02	0.33	34.10	91.52	1
SCB	47	44.02	1.33	13.10	33.10	3
HBL	47	44.02	1.67	11.90	26.36	6
NABIL	42	39.02	1.33	4.1	29.33	5
EBL	60	57.02	1.78	29.5	32.03	4
HBBL	28	25.02	1.56	54.10	16.04	7
NIB	32	29.02	0.67	8.9	43.31	2
BOK	51	48.02	3.11	5	15.44	8

Risk free rate of return is 2.98%.

In the above table shows that the entire betas are positive. It denotes that all the securities is linear to market. If any security of beta is negative investors have to eliminate these securities from the investment alternative. Since securities are ranked from highest excess return to beta to lowest, we know that if a particular security belongs in the optimal portfolio, all higher ranked securities also belongs in the optimum portfolio. The ranking represents the desirability of any securities inclusion on a portfolio. The number of securities selected depends on a unique cut off rate, such that all securities with higher $(R_i - R_f)$ will be included all securities with lower ratio excluded. The value of cut off rate (C_j) computed from risk and return characteristics of securities of determines the security of optimum portfolio. After getting the C_j value of all securities, investors select highest C_j value that is C^* . Among all securities only those securities were selected, having greater value than C^* . In this case highest C_j value is 14.34. Which is selected as C^* .

Table 4.10
Calculation of C^*

Bank	Rm	Excess Return over Beta ($R_i - R_f$)/	($R_i - R_f$) \times	$\frac{1}{\beta_j}$ /Ur	Cum 2	Cum 3	Cal. Of Rate (C^*)	Z value
SBI	9.00	91.52	0.29	0.00	0.29	0.00	1.15	0.23
SCB	9.00	33.10	4.47	0.14	4.76	0.14	11.72	2.53
HBL	9.00	26.36	6.18	0.23	10.94	0.37	10.64	2.81
NABIL	9.00	29.33	12.72	0.43	23.66	0.80	13.05	6.45
EBL	9.00	32.03	3.44	0.11	27.10	0.91	14.34	1.89
NBBL	9.00	16.04	0.72	0.04	27.82	0.95	4.39	0.07
NIB	9.00	43.31	2.18	0.05	30	1	10.27	1.45
BOK	9.00	15.44	29.87	1.93	59.87	2.95	7.49	2.12

C^* is the Highest C_j value (i.e.) 14.34
(Cut of rate C^*)

$$C_j = \frac{\frac{\sigma_j^2 (R_j - R_f) \sigma_j}{\sigma_{ei}^2}}{\frac{1}{\sigma_{ei}^2} \sum_{j=1}^N \frac{\sigma_j^2}{\sigma_{ei}^2}}$$

$$\text{Weight of security } (Z_j) = \frac{Z_j}{\sum_{j=1}^N Z_j}$$

Where,

$$Z_j = \frac{\sigma_j^2}{\sigma_{ei}^2} \frac{R_j - R_f}{B_j} ZC^*$$

Where,

C^* = Selected cut of rate

R_j = Expected return of Stock j

R_f = Risk free rate of return

β_j = Beta of Stock j

σ_{ei}^2 = Unsystematic risk of stock j.

To construct the optimum portfolio, the percentage invested for each security in the optimum portfolio is to be calculated. To find the weight of selected securities in portfolio Z value is calculated. Weight is the proportion of Z value on the base of total Z value of portfolio.

By the above calculation investor can conclude that eight securities are included by the Sharpe single index model.

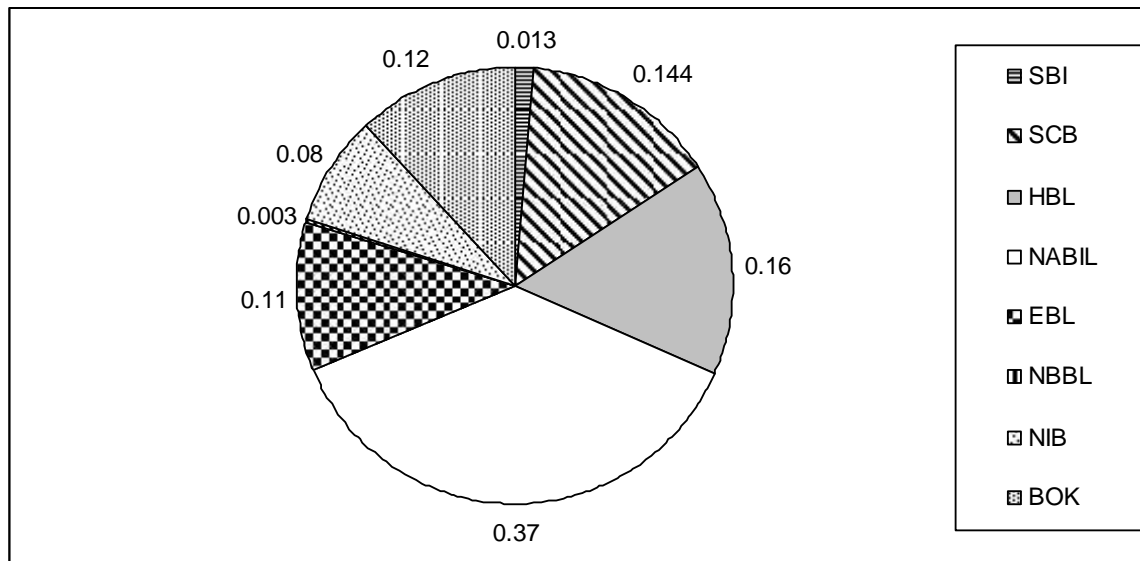
Table 4.11
Calculation of z table of weight

Bank	Z value	
SBI	0.23	0.013
SCB	2.53	0.144
HBL	2.81	0.16
NABIL	6.45	0.37
EBL	1.89	0.11
NBBL	0.07	0.003
NIB	1.45	0.08
BOK	2.12	0.12
Total	17.55	1

4.8.2 Optimum portfolio composition.

Figure 4.10

Optimum Portfolio Composition is shown by Pie chart



Above chart shows the proportion of optimum securities. We would invest 13% of our fund in SBI Bank 14.4% in Security SCB, 16% in HBL, 37% in NABIL, 11% in Security EBL, 3% in security NBBL, 8% in security NIB and 12% in security BOK.

CHAPTER -5

SUMMARY CONCLUSION AND RECOMMENDATION

This chapter is a complete conclusive and suggestive package, which contains summary conclusion of the findings and actionable plans that means suggestion for further improvement. Research summarized in summary part , In conclusion part analysis of relevant data by using various financial and statistical tools , which presents the opportunity and threats, strengths and weakness of the commercial bank and the recommendation part presented in term of suggestion , which are prepared on the basis of finding and conclusion.

5.1 Summary :

The development of any country depends upon its economic development. Financial restructuring is necessary for economic development. Similarly, good investment policies have a positive impact on economic development of the country.

Today in the changing nature of competition and in the increasing pressure of globalization, investment management has become the most critical determinant of investment. The changing life standard has always been challenging to the business community and also has given opportunities to produce different types of goods and services to fulfill the changing needs of people .No investor invest their capital until they are fully assure that investment is safe it requires a present sacrifice for a future uncertain benefit . According to the capacity of risk bearing, investors are different nature. Some are risk averse and some may be neutral

Risk and return is the key factor to analysis the financial condition of the company for investor. Risk and return move together .No one can guess what turn the rate of return will take in the future, No investor will be ready to invest their capital on risky assets unless they are not assured of adequate compensation for accepting the risk.

Nepal stock exchange (NEPSE) is the only stock market in Nepal. It is the first listed company for share transactions. All the securities (accept government securities) are traded in such stock market.

Portfolio is a bundle of or combination of individual assets or securities. The investment portfolio usually offers the advantage of reducing risk through diversification of risk from risky investment to less risky investment. The objective of portfolio analysis is to develop a portfolio that has the maximum return at whatever level of risk the investor deems appropriate if the investor diversify funds into many more securities, that continue to spread out firm specific factor and portfolio volatility should continue to fall. Therefore portfolio analysis considers the determination of future risk and return.

The objectives of this research are to find out risk and return analysis of stock, to find out the portfolio of investment for an investor, and to find out optimal portfolio among the security trading in NEPSE. The data used in this study are mainly secondary data. Eight listed commercial banks in NEPSE are taken as a sample. Cross sectional data are used to analyzed risk and reutun. Analysis is divided into two generation 1st generation (which was established before 1993) and 2nd generation (which was established after 1993). With the help of expected rate of return, standard deviation, Variance and Coefficient of Variation, Market sensitivity, Expected risk and return of commercial banks are analyzed. With the help of beta of the stocks, covariance with the market, systematic and Unsystematic risk, the required rate of return of commercial banks in evaluated.

Sharpe's optimum portfolio model/single index model used to find out the optimum portfolio among the sample securities. To make the analysis easy to understand some related studies are reviewed. Tables and digram are used to present the data and results from the analysis. Following findings are summarized and made conclusion as follows:

5.2 Conclusion

The major findings and conclusion of the study from different analysis are as follows:

- i) The expected return is an average return of the investment among the 1st generation. Sample bank EBL has highest return i.e. 60% and the expected return of remaining banks namely NABIL NIB, SCB, HBL has less than 50% expected return of NIB is low i.e. 32% likewise 2nd generation. Sample banks, BOK has highest expected return of 51% and the expected return of remaining banks namely SBI and NBBL has less than 50%. Expected return of NBBL is low i.e. 28%.
- ii) Risk is the variability of returns which is measured in terms of S.D. of returns, In terms of risk in 1st generation bank standard deviation of HBL is high and NIB is less. Standard deviation of EBL is 59% and it has the highest expected return it indicates that "High risk, high return". In terms of risk in 2nd generation bank standard deviation of BOK is high with 96% and NBBL is low with 76%.
- iii) Market return of NEPSE index is 13%. Standard deviation of market is 30% and C.V. is 2.31 times. So the market rate of return is not satisfactory in comparisons to its risk level.
- iv) Beta coefficient represents systematic risk of particular assets relative to the market. According to the calculation of beta coefficient common stock of BOK is the most volatile one i.e. 3.11 and SBI stock is least volatile i.e. 0.33. The beta of NIB and SBI is less than 1 ($b < 1$), this type of securities is said to be defensive stock. Similarly beta of NABIL, SCB, HBL, NBBL, EBL and BOK is greater than 1 ($b > 1$) is said to be an aggressive stock.
- v) The proportion of systematic risk and unsystematic risk among the sample banks has high variation. The range of systematic risk is 0.026 to 14.22% and range of unsystematic risk is 85.17% to 99.97%. BOK has highest systematic risk and NBBL has highest unsystematic risk.
- vi) Investors are risk lover, risk avoider risk lover investor ready to bear risk for higher rate of return and risk avoider investor try to avoid facing high risk and became ready to be satisfied in low return.

- vii) CAPM describes the relationship between risk and required return. All of commercial banks required rate of return is less than expected rate of return and are under priced. The highest required return is 34% of BOK and lowest required return is 6% of SBI. Higher the beta risk, higher will be the required rate of return and vice-versa.
- viii) The portfolio risk on investment is less than that of risk on individual investment that shows the portfolio analysis is useful to reduce risk. The portfolio risk and return analysis shows that higher amount of investment in risky assets, higher will be the return. Similarly higher amount invested in risk free assets, lower will be the return and lower will be the risk also and vice-versa.
- ix) Sharp single index model helps to find out the securities to be in optimal portfolio. The proportion of optimum portfolio securities. We would invest 1% of our fund in SBI 14.4% in SCB, 16% in HBL, 37% in NABIL, 11% in EBL, 3% in NBBL, 8% in NIB and 12% in BOK securities.

5.3 Recommendations

From the analysis and findings of the study, the following recommendation and suggestions are prescribed.

- i) Nepalese investors do not have their own clear vision toward effective investment. Hence investor should have rational and well known about the portfolios theory and investment strategies.
- ii) NEPSE is the only market of providing information. It is not sufficient and reliable for making investment decision so NEPSE need to modernize the trading system and effective information channel.
- iii) Financial information must be regularly published so that the existing as well as perspective investors are informed about the changes that take place.

- iv) Investment in single asset is not a possible to minimized risk what makes possible to minimize risk is the diversification of investments. So portfolio management is a dynamic subject matter.
- v) In terms of risk SBI shows least beta of 33% but its expected return is 33% and required return is 6%. It shows that SBI is taking low risk and having low return. If SBI takes some more risk there is chances of higher return. So SBI is recommended to face some risk.
- vi) Required rate of return of all the banks are less then expected rate of return so all the stock are under priced. Thus the investor's points of view suggest purchasing securities.
- vii) NBBL bank has highest unsystematic risk. The management can eliminate the unsystematic risk taking some effective action.
- viii) To reduce risk in future under priced stock should be purchase, when market price will raise sale the over priced securities.
- ix) Investor always wants to minimize risk or maximum return. So Markowitz mean variance model provides best portfolio combination for risk averter investors.
- x) Investors can also evaluate risk of the concerned companies by its beta. If beta is greater than 1, it can be concluded that the companies share is risky to invest. Risk averter investor must invest in companies having beta less than 1. Whereas risk lover investor can invest in companies having beta more than 1. Betas of most securities are aggressive. Aggressive securities create high risk so it should have to be managed.
- xi) In recent and last following year condition the political and Maoist problem of the country is the major burning problem, which affects the economy of the nation directly. At present the industry and share market is in the declining trend and it will may finished if the present situation remains for a long time.

- xii) People have liquidity but they are unproductive. Investment common stock is very risky job. There is not any guarantee in return. So try to find out available best alternative or various investment strategies and best portfolio which will increase wealth position of the investor and indirectly contribute to the economic growth of nation.

- xiii) With the help of single index model construct a optimum portfolio and make investment on 1% of own fund in SBI banks 14.4% in security SCB, 16% in HBL, 27% in security NABIL, 11% in security 3 % in security NBBL, 8% in NIB and 12% in security BOK.

ANNEX

Annex-1

Calculation of Total Dividend

NABIL

Fiscal year	Closing MPS	DPS	Stock dividend in %	Total dividend	EPS
16 July, 1997	500	0	100%	430	67.68
16 July, 1998	430	30	50%	380	44.5
16 July, 1999	700	50	-	50	67.84
16 July, 2000	1400	55	-	55	83.79
16 July, 2001	1500	40	25%	224	59.26
16 July, 2002	735	30	-	30	55.25
16 July, 2003	735	50	-	50	84.66
16 July, 2004	1000	65	-	65	92.61
16 July, 2005	1505	70	-	70	103.45
16 July, 2006	2240	85	-	85	129.21
16 July, 2007	5050 ?	?	?	?	?

The dividend = DPS + Next year's closing × Stock dividend %

NIB

Fiscal year	Closing MPS	DPS	Stock dividend in %	Total dividend	EPS
16 July, 1997	719	50	-	50	101.37
16 July, 1998	600	50	50%	461	69.33
16 July, 1999	822	30	-	30	33.75
16 July, 2000	1401	25	-	25	53.68
16 July, 2001	1150	0	100%	760	33.18
16 July, 2002	760	0	-	0	83.59
16 July, 2003	795	20	40%	396	39.56
16 July, 2004	940	15	-	15	51.70
16 July, 2005	800	12.58	-	12.58	39.31
16 July, 2006	1260	20	-	20	59.35
16 July, 2007	1729	?	35.46?	?	?

SCB

Fiscal year	Closing MPS	DPS	Stock dividend in %	Total dividend	EPS
16 July, 1997	1050	90	-	90	165.4
16 July, 1998	840	70	50%	651	129.62
16 July, 1999	1162	80	50%	1072.50	105.86
16 July, 2000	1985	100	-	100	115.62
16 July, 2001	2144	100	-	100	126.88
16 July, 2002	1550	100	-	100	141.13
16 July, 2003	1640	110	-	110	149.30
16 July, 2004	1745	110	10%	344.50	143.55
16 July, 2005	2345	120	-	120	143.55
16 July, 2006	3775	130	-	130	143.55
16 July, 2007	5900	?	10%	?	?

HBL

Fiscal year	Closing MPS	DPS	Stock dividend in %	Total dividend	EPS
16 July, 1997	640	50	-	50	115.08
16 July, 1998	755	50	-	50	113.31
16 July, 1999	1000	50	60%	1070	86.07
16 July, 2000	1700	50	25%	425	83.08
16 July, 2001	1500	27.5	25%	278	93.56
16 July, 2002	1000	25	30%	276	60.26
16 July, 2003	836	1.32	10%	85.32	49.45
16 July, 2004	840	0	25%	230	49.05
16 July, 2005	920	11.5	20%	232	47.91
16 July, 2006	1100	30	20%	382	59.24
16 July, 2007	1760	?	5%	?	?

SBI

Fiscal year	Closing MPS	DPS	Stock dividend in %	Total dividend	EPS
16 July, 1997	412	20.01	-	20.01	37.45
16 July, 1998	440	20.01	-	20.01	49.17
16 July, 1999	562	10	-	10	13.98
16 July, 2000	562	15.01	-	15.01	41.74
16 July, 2001	1500	0	100%	401	8.69
16 July, 2002	401	0	50%	127.5	9.61
16 July, 2003	255	8	-	8	11.47
16 July, 2004	307	0	-	0	14.25
16 July, 2005	335	0	-	0	13.29
16 July, 2006	612	5	-	5	18.27
16 July, 2007	1176	?	?	?	?

NBBL

Fiscal year	Closing MPS	DPS	Stock dividend in %	Total dividend	EPS
16 July, 1997	153	7.5	-	7.5	17.62
16 July, 1998	252	15.77	-	15.77	52.65
16 July, 1999	616	15.47	-	15.47	71.1
16 July, 2000	1502	0	-	0	118.48
16 July, 2001	1100	5.04	100%	515	83.45
16 July, 2002	510	0	25%	90	18.41
16 July, 2003	360	0	-	0	19.87
16 July, 2004	290	0	-	0	-
16 July, 2005	265	0	-	0	-
16 July, 2006	199	0	-	0	-
16 July, 2007	550	?	?	?	?

EBL

Fiscal year	Closing MPS	DPS	Stock dividend in %	Total dividend	EPS
16 July, 1997	127	0	-	0	-9.2
16 July, 1998	184	0	-	0	21.29
16 July, 1999	407	15	-	15	21.31
16 July, 2000	980	0	-	0	34.85
16 July, 2001	750	0	100%	430	31.56
16 July, 2002	430	0	-	0	32.91
16 July, 2003	445	20	22%	169.6	29.9
16 July, 2004	680	20	-	20	143.57
16 July, 2005	870	0	-	0	37.54
16 July, 2006	1379	25	20%	511	45.81
16 July, 2007	2430	?	?	?	?

BOK

Fiscal year	Closing MPS	DPS	Stock dividend in %	Total dividend	EPS
16 July, 1997	-	-	-	0	-2.86
16 July, 1998	153	-	-	0	-10.85
16 July, 1999	285	7.49	-	7.49	24.67
16 July, 2000	998	32.74	-	32.74	40.73
16 July, 2001	850	0	-	0	27.97
16 July, 2002	254	10	-	10	2
16 July, 2003	198	5	-	5	17.72
16 July, 2004	295	10	-	10	27.40
16 July, 2005	430	15	-	15	30.10
16 July, 2006	850	18	-	18	43.67
16 July, 2007	1375	?	?	?	0

Annex 2

Single Year Holding Period Return of :

NIBIL

Fiscal year	Closing MPS	Total Dividend Rs.	$R = \frac{D_t \Gamma(P_t Z P_{tZ1})}{P_{tZ1}}$
16 July, 1997	500	430	-
16 July, 1998	430	380	0.62
16 July, 1999	700	50	0.74
16 July, 2000	1400	55	1.08
16 July, 2001	1500	224	0.23
16 July, 2002	735	30	-0.49
16 July, 2003	735	50	0.07
16 July, 2004	1000	65	0.45
16 July, 2005	1505	70	0.58
16 July, 2006	2240	85	0.54
16 July, 2007	5050	?	?
		Total	3.82

NIB

Fiscal year	Closing MPS	Total Dividend Rs.	$R = \frac{D_t \Gamma(P_t Z P_{tZ1})}{P_{tZ1}}$
16 July, 1997	719	50	-
16 July, 1998	600	461	0.48
16 July, 1999	822	30	0.42
16 July, 2000	1401	25	0.73
16 July, 2001	1150	760	0.36
16 July, 2002	760	0	-0.34
16 July, 2003	795	396	0.57
16 July, 2004	940	15	0.20
16 July, 2005	800	12.58	-0.14
16 July, 2006	1260	20	0.60
16 July, 2007	1729	?	?
		Total	2.88

SCB

Fiscal year	Closing MPS	Total Dividend RA	$R = \frac{D_t \Gamma(P_t Z P_{tZ})}{P_{tZ}}$
16 July, 1997	1050	90	-
16 July, 1998	840	651	0.42
16 July, 1999	1162	1072.5	1.66
16 July, 2000	1985	100	0.79
16 July, 2001	2144	100	0.13
16 July, 2002	1550	100	-0.23
16 July, 2003	1640	110	0.13
16 July, 2004	1745	344.50	0.27
16 July, 2005	2345	120	0.41
16 July, 2006	3775	130	0.67
16 July, 2007	5900	?	?
		Total	4.25

HBL

Fiscal year	Closing MPS	Total Dividend RA	$R = \frac{D_t \Gamma(P_t Z P_{tZ})}{P_{tZ}}$
16 July, 1997	640	50	-
16 July, 1998	755	50	0.26
16 July, 1999	1000	1070	1.74
16 July, 2000	1700	425	1.13
16 July, 2001	1500	278	0.05
16 July, 2002	1000	276	-0.15
16 July, 2003	836	85.32	-0.08
16 July, 2004	840	230	0.28
16 July, 2005	920	232	0.37
16 July, 2006	1100	382	0.61
16 July, 2007	1760	?	?
		Total	4.21

SBI

Fiscal year	Closing MPS	Total Dividend RA	$R = \frac{D_t \Gamma(P_t Z P_{tZt})}{P_{tZt}}$
16 July, 1997	412	20.01	-
16 July, 1998	440	20.01	0.12
16 July, 1999	562	10	0.30
16 July, 2000	562	15.01	0.03
16 July, 2001	1500	401	2.38
16 July, 2002	401	127.50	-0.65
16 July, 2003	255	8	-0.34
16 July, 2004	307	0	0.20
16 July, 2005	335	0	0.09
16 July, 2006	612	5	0.84
16 July, 2007	1176	?	?
		Total	2.97

HBBL

Fiscal year	Closing MPS	Total Dividend RA	$R = \frac{D_t \Gamma(P_t Z P_{tZt})}{P_{tZt}}$
16 July, 1997	153	7.5	-
16 July, 1998	252	15.77	0.75
16 July, 1999	616	15.47	1.51
16 July, 2000	1502	0	1.44
16 July, 2001	1100	515	0.08
16 July, 2002	510	90	-0.45
16 July, 2003	360	0	-0.29
16 July, 2004	290	0	-0.19
16 July, 2005	265	0	-0.09
16 July, 2006	199	0	-0.25
16 July, 2007	550	?	
		Total	2.51

EBL

Fiscal year	Closing MPS	Total Dividend RA	$R = \frac{D_t \Gamma(P_t Z P_{tZ1})}{P_{tZ1}}$
16 July, 1997	127	0	-
16 July, 1998	184	0	0.45
16 July, 1999	407	15	1.29
16 July, 2000	980	0	1.41
16 July, 2001	750	430	0.20
16 July, 2002	430	0	-0.43
16 July, 2003	445	169.60	0.43
16 July, 2004	680	20	0.57
16 July, 2005	870	0	0.28
16 July, 2006	1379	511	1.17
16 July, 2007	2430	?	?
		Total	5.37

BOK

Fiscal year	Closing MPS	Total Dividend RA	$R = \frac{D_t \Gamma(P_t Z P_{tZ1})}{P_{tZ1}}$
16 July, 1997	-	0	-
16 July, 1998	153	0	-
16 July, 1999	285	7.49	0.91
16 July, 2000	998	32.74	2.62
16 July, 2001	580	0	-0.15
16 July, 2002	254	10	-0.69
16 July, 2003	198	5	-0.20
16 July, 2004	295	10	0.54
16 July, 2005	430	15	0.51
16 July, 2006	850	18	1.02
16 July, 2007	1375	?	?
		Total	4.56

Annex -3

Expected Return (\bar{R}), Standard deviation (Ξ), Coefficient of variation (C.V.) and Variance of the Market

Fiscal year	NEPSE Index Ni	$R_m = \frac{NI_t \Gamma(NI_t Z NI_{tZ1})}{NI_{tZ1}}$	$R_m - \bar{R}_m$	$(R_m - \bar{R}_m)$
16 July, 1997	176	-	-	-
16 July, 1998	163	-0.07	-0.20	0.04
16 July, 1999	217	0.33	0.20	0.04
16 July, 2000	361	0.66	0.53	0.28
16 July, 2001	348	-0.03	-0.16	0.03
16 July, 2002	228	-0.35	-0.48	0.23
16 July, 2003	205	-0.10	-0.23	0.05
16 July, 2004	222	0.08	-0.05	0.003
16 July, 2005	287	0.29	0.16	0.03
16 July, 2006	387	0.35	0.22	0.05
16 July, 2007	684	?	?	?
\bar{R}	0.13			
<i>S.D.</i>	0.30			
<i>Var.</i>	0.09			
<i>C.V.</i>	2.31			

Data source:- NEPSE

$$\bar{R}_m \times \frac{1.16}{9} \times 0.13$$

$$\dagger = \sqrt{\frac{(R_m Z \bar{R}_m)^2}{N Z 1}} = \sqrt{\frac{0.75}{9 Z 1}} \times \sqrt{0.09} \times 0.30$$

$$\text{Variance} = \dagger^2 = 0.30 \times 0.30 = 0.09$$

$$\text{C.V.} = \frac{\dagger}{R_m} = \frac{0.30}{0.13} \times 2.31$$

Annex-4

Covariance and Beta Coefficient of NABIL

Fiscal year	R_j	$R_j - \overline{R_j}$	R_m	$R_m - \overline{R_m}$	$(R_j - \overline{R_j}) \times (R_m - \overline{R_m})$
16 July, 1997	-	-	-	-	-
16 July, 1998	0.62	0.20	-0.07	-0.20	-0.04
16 July, 1999	0.74	0.32	0.33	0.20	0.06
16 July, 2000	1.08	0.66	0.66	0.53	0.35
16 July, 2001	0.23	-0.19	-0.03	-0.16	0.03
16 July, 2002	-0.49	-0.91	-0.35	-0.48	0.44
16 July, 2003	0.07	-0.35	-0.10	-0.23	0.08
16 July, 2004	0.45	0.03	0.08	-0.05	-0.002
16 July, 2005	0.58	0.16	0.29	0.16	0.03
16 July, 2006	0.54	0.12	0.35	0.22	0.03
16 July, 2007	?	?	?	?	?
Total	3.82		1.16		0.98
Cov.	0.12	Beta () = 1.33			

We have,

$$\overline{R_j} \times \frac{3.82}{9} \times 0.42$$

$$\begin{aligned} \text{Co-variance of } (R_j, R_m) &= \frac{(R_j - \overline{R_j}) \mid (R_m - \overline{R_m})}{n \cdot Z1} \\ &= \frac{0.98}{9 \cdot Z1} = \frac{0.98}{8} \times 0.12 \end{aligned}$$

$$\begin{aligned} \text{Beta (S)} &= \frac{\text{Cov}(R_j, R_m)}{\text{Var}(R_m)} \\ &= \frac{0.12}{0.09} \\ &= 1.33 \end{aligned}$$

Covariance and Beta Coefficient of NIB

Fiscal year	R_j	$R_j - \overline{R_j}$	R_m	$R_m - \overline{R_m}$	$\frac{R_j - \overline{R_j} \times R_m - \overline{R_m}}{\overline{R_m}}$
16 July, 1997	-	-	-	-	-
16 July, 1998	0.48	0.16	-0.07	-0.20	-0.03
16 July, 1999	0.42	0.10	0.33	0.20	0.02
16 July, 2000	0.73	0.41	0.66	0.53	0.22
16 July, 2001	0.36	0.04	-0.03	-0.16	-0.01
16 July, 2002	-0.34	-0.66	-0.35	-0.48	0.32
16 July, 2003	0.57	0.25	-0.10	-0.23	-0.06
16 July, 2004	0.20	-0.12	0.08	-0.05	0.01
16 July, 2005	-0.14	-0.46	0.29	0.16	-0.07
16 July, 2006	0.6	0.28	0.35	0.22	0.06
16 July, 2007	?	?	?	?	?
Total	2.88		1.16		0.46
Cov.	0.06	Beta () = 0.67			

We have,

$$\overline{R_j} \times \frac{2.88}{9} \times 0.32$$

$$\begin{aligned} \text{Co-variance of } (R_j, R_m) &= \frac{(R_j - \overline{R_j}) \mid (R_m - \overline{R_m})}{n \times 1} \\ &= \frac{0.46}{9 \times 1} = \frac{0.46}{8} \times 0.06 \end{aligned}$$

$$\begin{aligned} \text{Beta (S)} &= \frac{\text{Cov}(R_j, R_m)}{\text{Var}(R_m)} \\ &= \frac{0.06}{0.09} \\ &= 0.67 \end{aligned}$$

Covariance and Beta Coefficient of SCB

Fiscal year	R_j	$R_j - \overline{R_j}$	R_m	$R_m - \overline{R_m}$	$(R_j - \overline{R_j}) \times (R_m - \overline{R_m})$
16 July, 1997	-	-	-	-	-
16 July, 1998	0.42	-0.05	-0.07	-0.20	0.01
16 July, 1999	1.66	1.19	0.33	0.20	0.24
16 July, 2000	0.79	0.32	0.66	0.53	0.17
16 July, 2001	0.13	-0.34	-0.03	-0.16	0.05
16 July, 2002	-0.23	-0.70	-0.35	-0.48	0.34
16 July, 2003	0.13	-0.34	-0.10	-0.23	0.08
16 July, 2004	0.27	-0.20	0.08	-0.05	0.01
16 July, 2005	0.41	-0.06	0.29	0.16	-0.01
16 July, 2006	0.67	0.20	0.35	0.22	0.04
16 July, 2007	?	?	?	?	?
Total	4.25		1.16		0.93
Cov.	0.12	Beta () = 1.33			

We have,

$$\overline{R_j} = \frac{\sum R_j}{N} = \frac{4.25}{9} = 0.47$$

$$\begin{aligned} \text{Co-variance of } (R_j, R_m) &= \frac{\sum (R_j - \overline{R_j})(R_m - \overline{R_m})}{n - 1} \\ &= \frac{0.93}{9 - 1} = \frac{0.93}{8} = 0.12 \end{aligned}$$

$$\begin{aligned} \text{Beta (S)} &= \frac{\text{Cov}(R_j, R_m)}{\text{Var}(R_m)} \\ &= \frac{0.12}{0.09} \\ &= 1.33 \end{aligned}$$

Covariance and Beta Coefficient of HBL

Fiscal year	R_j	$R_j - \overline{R_j}$	R_m	$R_m - \overline{R_m}$	$\frac{R_j - \overline{R_j} \times R_m - \overline{R_m}}{\overline{R_m}}$
16 July, 1997	-	-	-	-	-
16 July, 1998	0.26	-0.21	-0.07	-0.20	0.04
16 July, 1999	1.74	1.27	0.33	0.20	0.25
16 July, 2000	1.13	0.66	0.66	0.53	0.35
16 July, 2001	0.05	-0.42	-0.03	-0.16	0.07
16 July, 2002	-0.15	-0.62	-0.35	-0.48	0.30
16 July, 2003	-0.08	-0.55	-0.10	-0.23	0.13
16 July, 2004	0.28	-0.19	0.08	-0.05	0.01
16 July, 2005	0.37	-0.10	0.29	0.16	-0.02
16 July, 2006	0.61	0.14	0.35	0.22	0.03
16 July, 2007	?	?	?	?	?
Total	4.21		1.16		1.16
Cov.	0.15	Beta () = 1.67			

We have,

$$\overline{R_j} \times \frac{R_j}{N} \times \frac{4.21}{9} \times 0.47$$

$$\begin{aligned} \text{Co-variance of } (R_j, R_m) &= \frac{(R_j - \overline{R_j}) \mid (R_m - \overline{R_m})}{n \times 1} \\ &= \frac{1.6}{9 \times 1} = \frac{1.16}{8} \times 0.15 \end{aligned}$$

$$\begin{aligned} \text{Beta (S)} &= \frac{\text{Cov}(R_j, R_m)}{\text{Var}(R_m)} \\ &= \frac{0.15}{0.09} \\ &= 1.67 \end{aligned}$$

Covariance and Beta Coefficient of SBI

Fiscal year	R_j	$R_j - \overline{R_j}$	R_m	$R_m - \overline{R_m}$	$\frac{R_j - \overline{R_j} \times R_m - \overline{R_m}}{\overline{R_m}}$
16 July, 1997	-	-	-	-	-
16 July, 1998	0.12	-0.21	-0.07	-0.20	0.04
16 July, 1999	0.30	-0.03	0.33	0.20	-0.01
16 July, 2000	0.03	-0.3	0.66	0.53	-0.16
16 July, 2001	2.38	2.05	-0.03	-0.16	-0.33
16 July, 2002	-0.65	-0.98	-0.35	-0.48	0.47
16 July, 2003	-0.34	-0.67	-0.10	-0.23	0.15
16 July, 2004	0.20	-0.13	0.08	-0.05	0.01
16 July, 2005	0.09	-0.24	0.29	0.16	-0.04
16 July, 2006	0.84	0.51	0.35	0.22	0.11
16 July, 2007	?	?	?	?	?
Total	2.97		1.16		0.24
Cov.	0.03	Beta () = 0.33			

We have,

$$\overline{R_j} \times \frac{R_j}{N} \times \frac{2.97}{9} \times 0.33$$

$$\begin{aligned} \text{Co-variance of } (R_j, R_m) &= \frac{(R_j - \overline{R_j}) \mid (R_m - \overline{R_m})}{n - 1} \\ &= \frac{0.24}{9 - 1} = \frac{0.24}{8} \times 0.03 \end{aligned}$$

$$\begin{aligned} \text{Beta (S)} &= \frac{\text{Cov}(R_j, R_m)}{\text{Var}(R_m)} \\ &= \frac{0.03}{0.09} \\ &= 0.33 \end{aligned}$$

Covariance and Beta Coefficient of NBBL

Fiscal year	R_j	$R_j - \overline{R_j}$	R_m	$R_m - \overline{R_m}$	$\frac{R_j - \overline{R_j} \times R_m - \overline{R_m}}{\overline{R_m}}$
16 July, 1997	-	-	-	-	-
16 July, 1998	0.75	0.47	-0.07	-0.20	-0.09
16 July, 1999	1.51	1.23	0.33	0.20	0.25
16 July, 2000	1.44	1.16	0.66	0.53	0.61
16 July, 2001	0.08	-0.20	-0.03	-0.16	0.03
16 July, 2002	-0.45	-0.73	-0.35	-0.48	0.35
16 July, 2003	-0.29	-0.57	-0.10	-0.23	0.13
16 July, 2004	-0.19	-0.47	0.08	-0.05	0.02
16 July, 2005	-0.09	-0.37	0.29	0.16	-0.06
16 July, 2006	-0.25	-0.53	0.35	0.22	-0.12
16 July, 2007	?	?	?	?	?
Total	2.51		1.16		1.12
Cov.	0.14	Beta () = 1.56			

We have,

$$\overline{R_j} \times \frac{R_j}{N} \times \frac{2.51}{9} \times 0.28$$

$$\begin{aligned} \text{Co-variance of } (R_j, R_m) &= \frac{(R_j - \overline{R_j}) \mid (R_m - \overline{R_m})}{n \times 1} \\ &= \frac{1.12}{9 \times 1} = \frac{1.12}{8} \times 0.14 \end{aligned}$$

$$\begin{aligned} \text{Beta (S)} &= \frac{\text{Cov}(R_j, R_m)}{\text{Var}(R_m)} \\ &= \frac{0.14}{0.09} \\ &= 1.56 \end{aligned}$$

Covariance and Beta Coefficient of EBL

Fiscal year	R_j	$R_j - \overline{R_j}$	R_m	$R_m - \overline{R_m}$	$\frac{R_j - \overline{R_j} \times R_m - \overline{R_m}}{\overline{R_m}}$
16 July, 1997	-	-	-	-	-
16 July, 1998	0.45	-0.15	-0.07	-0.20	0.03
16 July, 1999	1.29	0.69	0.33	0.20	0.14
16 July, 2000	1.41	0.81	0.66	0.53	0.43
16 July, 2001	0.20	-0.40	-0.03	-0.16	0.06
16 July, 2002	-0.43	-1.03	-0.35	-0.48	0.49
16 July, 2003	0.43	-0.17	-0.10	-0.23	0.04
16 July, 2004	0.57	-0.03	0.08	-0.05	0.002
16 July, 2005	0.28	-0.32	0.29	0.16	-0.05
16 July, 2006	1.17	0.57	0.35	0.22	0.13
16 July, 2007	?	?	?	?	?
Total	5.37		1.16		1.27
Cov.	0.16	Beta () = 1.78			

We have,

$$\overline{R_j} = \frac{R_j}{N} = \frac{5.37}{9} = 0.60$$

$$\begin{aligned} \text{Co-variance of } (R_j, R_m) &= \frac{(R_j - \overline{R_j}) \times (R_m - \overline{R_m})}{n - 1} \\ &= \frac{1.27}{9 - 1} = \frac{1.27}{8} = 0.16 \end{aligned}$$

$$\begin{aligned} \text{Beta (S)} &= \frac{\text{Cov}(R_j, R_m)}{\text{Var}(R_m)} \\ &= \frac{0.16}{0.09} \\ &= 1.78 \end{aligned}$$

Covariance and Beta Coefficient of BOK

Fiscal year	R_j	$R_j - \overline{R_j}$	R_m	$R_m - \overline{R_m}$	$\frac{R_j - \overline{R_j} \times R_m - \overline{R_m}}{\overline{R_m}}$
16 July, 1997	-	-	-	-	-
16 July, 1998	-	-0.51	-0.07	-0.20	0.10
16 July, 1999	0.91	0.40	0.33	0.20	0.08
16 July, 2000	2.62	2.11	0.66	0.53	1.12
16 July, 2001	-0.15	-0.66	-0.03	-0.16	0.11
16 July, 2002	-0.69	-1.20	-0.35	-0.48	0.58
16 July, 2003	-0.20	-0.71	-0.10	-0.23	0.16
16 July, 2004	0.54	0.03	0.08	-0.05	-0.002
16 July, 2005	0.51	0	0.29	0.16	0
16 July, 2006	1.02	0.51	0.35	0.22	0.11
16 July, 2007	?	?	?	?	?
Total	4.56		1.16		2.26
Cov.	0.28	Beta () = 3.11			

We have,

$$\overline{R_j} \times \frac{R_j}{N} \times \frac{4.56}{9} \times 0.51$$

$$\begin{aligned} \text{Co-variance of } (R_j, R_m) &= \frac{(R_j - \overline{R_j}) \mid (R_m - \overline{R_m})}{n \times 1} \\ &= \frac{2.26}{9 \times 1} = \frac{2.26}{8} \times 0.28 \end{aligned}$$

$$\begin{aligned} \text{Beta (S)} &= \frac{\text{Cov}(R_j, R_m)}{\text{Var}(R_m)} \\ &= \frac{0.28}{0.09} \\ &= 3.11 \end{aligned}$$

Annex-5

Systematic Risk

Bank	i_m	i_m^2	Ξ_m^2	Systematic Risk
NABIL	1.33	1.77	0.09	0.159
NIB	0.67	0.45	0.09	0.041
SCB	1.33	1.77	0.09	0.159
HBL	1.67	2.79	0.09	0.251
EBL	0.33	0.11	0.09	0.009
SBI	1.56	2.43	0.09	0.219
NBBL	1.78	3.17	0.09	0.285
BOK	3.11	9.67	0.09	0.870

$$\text{Systematic Risk} = \Xi_m^2 \times i_m^2$$

Unsystematic Risk

Bank	Ξ_i	Ξ_i^2	i_m	i_m^2	Ξ_m^2	Unsystematic Risk
NABIL	0.45	0.20	1.33	1.77	0.09	0.041
NIB	0.36	0.13	0.67	0.45	0.09	0.089
SCB	0.54	0.29	1.33	1.77	0.09	0.131
HBL	0.61	0.37	1.67	2.79	0.09	0.119
EBL	0.59	0.35	0.33	0.11	0.09	0.341
SBI	0.87	0.76	1.56	2.43	0.09	0.541
NBBL	0.76	0.58	1.78	3.17	0.09	0.295
BOK	0.96	0.92	3.11	9.67	0.09	0.05

$$\text{Unsystematic Risk} = \Xi_i^2 - i_m^2 \times \Xi_m^2$$

Annex 6

Calculation of Portfolio return

$$R_{BI} = 0.46, \quad R_{BII} = 0.37$$

W_{BI}	W_{BII}	$\overline{R_{BI}}$	$\overline{R_{BII}}$	R_p
1	0	0.460	0.000	0.46
0.90	0.10	0.414	0.037	0.38
0.80	0.20	0.368	0.074	0.31
0.70	0.30	0.322	0.111	0.26
0.60	0.40	0.276	0.148	0.22
0.50	0.50	0.23	0.185	0.21
0.40	0.60	0.184	0.222	0.20
0.30	0.70	0.138	0.259	0.22
0.20	0.80	0.092	0.296	0.25
0.10	0.90	0.046	0.333	0.30
0	1	0.000	0.370	0.37

Note: Weight in assumed to be

0 to 1

We have,

$$\begin{aligned} R_p &= R_{BI} \times W_{BI} + R_{BII} \times W_{BII} \\ &= 0.460 \times 1 + 0.000 + 0 \end{aligned}$$

Annex 7

Calculation of Covariance

R_{BI}	R_{BII}	$R_{BI} - \overline{R_{BI}}$	$R_{BII} - \overline{R_{BII}}$	$(R_{BI} - \overline{R_{BI}}) \times (R_{BII} - \overline{R_{BII}})$
0.45	0.29	-0.01	-0.08	0.001
1.17	0.91	0.71	0.54	0.383
1.03	1.36	0.57	0.99	0.564
0.19	0.77	-0.27	0.40	-0.108
-0.33	-0.60	-0.79	-0.97	0.766
0.22	-0.28	-0.24	-0.65	0.156
0.35	0.18	-0.11	-0.19	0.021
0.30	0.17	-0.16	-0.20	0.032
0.72	0.54	0.26	0.17	0.044
Total = 4.10	3.34			1.859
Average return = 0.46	0.37			
Cov.	0.232			

We have,

$$\begin{aligned} \text{Co-variance of } (R_{BI}, R_{BII}) &= \frac{(R_{BI} \sum R_{BI}) | (R_{BII} \sum R_{BII})}{n \sum 1} \\ &= \frac{1.859}{9 \sum 1} = 0.232 \end{aligned}$$

Calculation of Portfolio risk

$\exists_{BI} = 0.46, \quad \exists_{BII} = 0.60$

\check{S}_{BI}^2	\check{S}_{BII}^2	\dagger_{BI}^2	\dagger_{BII}^2	$Cov(R_{BI}, R_{BII})$	\dagger_p
1	0	0.212	0.36	0.232	0.46
0.81	0.01	0.212	0.36	0.232	0.42
0.64	0.04	0.212	0.36	0.232	0.40
0.49	0.09	0.212	0.36	0.232	0.39
0.36	0.16	0.212	0.36	0.232	0.41
0.25	0.25	0.212	0.36	0.232	0.41
0.16	0.36	0.212	0.36	0.232	0.44
0.09	0.49	0.212	0.36	0.232	0.47
0.04	0.64	0.212	0.36	0.232	0.50
0.01	0.81	0.212	0.36	0.232	0.54
0	1	0.212	0.36	0.232	0.60

We have,

$$\dagger_p = \sqrt{\check{S}_1^2 \cdot \dagger_1^2 + \check{S}_2^2 \cdot \dagger_2^2 + 2\check{S}_1\check{S}_2Cov_{12}}$$

Glossary of key Terms Used In This Study

Annual report:	A Published report prepared by a publicly firm that contains audited financial statement.
Beta:	An indicator of the systematic or non-diversifiable risk of assets of portfolio.
Coefficient of Variation:	A measure of the risk per unit of return.
Common Stock	Equities or equity securities, issued as ownership shares in a publicly held corporation.
Coupon rate:	The nominal interest rate paid on a bond.
Diversifiable risk:	Risk attributable to firm specific risk or non-market risk.
Expected return:	The probability of the possible outcomes
Income Statement:	A financial statement showing firms revenues and expenses during a specified period.
Investment Strategies:	Strategies dealing with the selection of investment alternative, the timing of investment purchases and sales, and the degree of portfolio diversification.
Investment Portfolio:	Set of securities chosen by an investor.
Portfolio Effect:	The reduction in total risk resulting from combining individual assets into a portfolio.

- Portfolio Return: The weighted average of the expected returns of the individual assets in the portfolio.
- Portfolio Risk: The volatility of a portfolio's returns estimated by combining the measures of individual assets risk.
- Risk free rate: The interest rate that can be earned with certainty.
- Stock dividend: A dividend paid in the form of a additional share of common stocks.
- Systematic risk: Risk that has an its source factors that affect all marketable assets and thus can not be diversified away.
- Treasury bill: A fixed income security issued by the government with a term to maturity of 91 days.
- Variance: The expected value of the squared deviation of returns from the mean return.

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