CHAPTER ONE

INTRODUCTION

1.1 General Background

Investment in its broadest sense means the sacrifice of current rupees (dollars) and resources for the sake of future rupees (dollars) and resources. In other words, it is a commitment of money and other resources that are expected to generate additional money and resources in the future. Such a commitment takes place in the present time and is certain to occur but the reward comes in the future and always remains uncertain. Therefore every investment entails some degree of risk.

Investments are made in assets. Assets generally are of two types: Real assets (land, building, factories etc) and financial assets (stocks, Bonds, T -Bills etc). Real assets investments are generally less liquid than financial investment. Return on real asset investment is frequently more difficulties to measure. But in our study we are concerned with financial investment especially with common stock investment.

Investment is the employment of funds with the aim of achieving additional income or growth in value. Investment involves long - term commitment and waiting for a reward. Every investment involves same degree of risk. The "Risk and Return" is the Fundamental part of the investment decision.

1.1.1 Risk

Risk is chances of happening loss due to uncertainty. It arises due to uncertain environment. In other words, it is the chances of happening something beyond the expectation is known as risk. It is the variability between the actual return and expected returns. Greater the variability higher the risk and lower the variability lower the risk. But to what some extent risk can be managed through the creation of portfolio of securities.

1.1.2 Return

Return is the motivating forces in the investment process, that is, it is the reward for undertaking the investment. Return on common stock investment consists of two components. The first component is the periodic cash receipts (either interest or dividend) this cash receipt is also known as ordinary gain on investment. The second component is the appreciation (or depreciation) in the price of the assets and this is commonly known as capital gain or loss. Therefore the total return on investment is the sum of the ordinary gain and capital gain and loss. Mathematically,

Total return = capital gain (loss) + Ordinary gain

A stock reflects the uncertainty about future returns such that actual return may be less than expected. The main source of uncertainty is the price at which the stock will be sold. Dividends tend to be much more stable than stock prices, which contribute to the immediate return received by the investors and at the same reduce the amount of earning re-invested by the firm which limits its potential growth. The stock price is affected by economic as well as non - economic factors. The risk of a stock can be measured by its price volatility, its beta. A systematic investment process should be followed to win the stock market. Investment process describes how an investor should go about making decision with regard to what marketable to invest in how extensive the investment should be and when the investment should be made. A five step procedure for making these decisions forms the basis of investment process.

- Set investment policy
- Perform security analysis
- Construct a portfolio
- Revise the portfolio
- Evaluate the performance of the portfolio (Sharpe, et.al; 1995:9)

Among this investment process the research focused on security analysis and portfolio selection. Security analysis involves examine of individual securities are group of securities with in the broad categories of financial assets .Portfolio construction identifies those specific assets in which to invest determining the proportion of the Investor's wealth. Diversification should be done to minimize the risk. Portfolio performance involves determining periodically how the portfolio performs in terms of not only the return earned, but also the risk experienced by the investor.

In Nepalese context, the concept of security market began with the set up of "Nepal stock exchange" former known as "securities exchange center" in 1976. This is only the stock market in Nepal. In spite of considerable development of stock market there is lot more to be done for the development of stock market in Nepal. Many investors are still afraid to invest in securities because of inadequate knowledge in this field and most investors are exploited from market intermediaries. For this purpose potential investors must be able to analyze risk and return of individual stock to increase market efficiency and consequently speed up the economic development.

Let's turn back to the history of commercial banks in Nepal start from the establishment of Nepal bank limited in 1994 B.S. It completely enjoys the monopoly market before the starting of Rastrya Banijya Bank in 2002. When Nepal has opened its door to foreign commercial banks to operate in the kingdom almost one and half decade back. Consequently Nepal Arab bank was established on 2041 under the commercial bank Act 2031. Nepal Indosuez bank was established as a joint venture between Nepal and France on 2042 and Nepal Grind lay banks on 2043.

After the economic liberalization, Himalayan Bank as a joint venture bank with Pakistan bank, Nepal SBI bank as a joint venture bank with reputed bank of India, State bank of India, Nepal Bangladesh bank as joint venture bank with

Bangladesh Bank, Bank of Katmandu as joint venture bank with Thailand bank as well as Everest bank limited as a joint venture bank with Punjab national bank etc are some of the examples. There is cut throat competition among these banks, which is healthy sign for the economic development of the country .Among the established commercial banks in Nepal, twenty banks are listed in NEPSE and for this research only five joint ventures banks are taken.

1.2 Focus of the Study

It is concerned with selecting optimal portfolio by risk-averse investors. Risk-averse investors selects efficient portfolio that maximizes return at a given level of risk or minimizes risk at a given level of return. With the collection of those efficient portfolios, the optimal portfolios can be obtained for given investors .The level of risk and return is depended upon the investor's preferences.

1. 3 Statement of the Problem

The major problems in the research work are follows: -

- Is there the lack of the reliable and accurate information?
- Are information's manipulated and exploited by the financial institutions?
- Does the Investors attitude and perception play a greater role in rational decision, influenced by the knowledge and access to the date required for analysis?
- Are there any clear and simple techniques to analyze the risk and return?
- Is government policy found less encouraging in promoting common stock investment?
- Does the market price and financial performance really indicate the condition of stick market of our country?
- In and efficient market condition stock price is equal to the intrinsic value?

- Which factor determines the stock price in a Nepalese stock market?

1. 4 Objectives of the Study

The major objective of the study is to assess the risk associated with return on common stock investment of the listed commercial banks on the basis of selective financial tools.

The other specific objectives of this study are as follows;-

- To evaluate common stock of listed commercial banks in terms of risk and return.
- To assess the risk compensating return of listed commercial banks and its position in the stock exchange.
- To obtain the return realized and expected return for the purpose of comparing with market return.
- To analyze the volatility of different stocks and other relevant variables.
- To determine and optimal portfolio.
- To provide the suggestive information.

1.5 Need or Significance of the Study

This research study will give the reliable information about Nepalese stock market and may contribute in the analytical power of the investors. In Nepalese context, very few studies are made and there are no specific magazines and articles on the topic. So the study will be more significant for the exploring and increasing stock investment. The main significance of the study are:

- This study will provides some knowledge about the Nepalese stock market development along with providing ideas to minimize the risk on stock investment.
- The study will have the clear conception over their investment. They will be able to distinct the right investment among all the investment opportunities.

- This study will be beneficial for all the persons who are directly or indirectly related to the Nepalese stock market.
- The study will be a matter of interest for academicians, students and investors.

1.6 Limitation of the Study

Everything has two fold i.e. Bright and Darkness, so as the any research study may not free from its own limitations. Mainly this study is made for the partial fulfillment of M.B.S. level. So there are couple of limitations which weaken the generalization, the main limitations are inadequate coverage of industries, time taken, reliability of statistical tools used and other variables which are not included in the study. The following are the limitations of the study.

- The study considered only five years observation covering from 2001/02 2006/07 as available of data.
- A major limitation of the study is the availability of needed data.
- The study depends upon the data published by NEPSE; NEPSE has not published recent data. In spite of lacking data. The study includes the available data as far as possible.
- The study is based on 5 samples only.
- The study is based on secondary data. So the reliability of the conclusion based upon the accuracy of secondary data.
- Time and resources are also the limitations of the study.

1. 7 Organization of the Study

This research study will include the following chapters are:

I Introduction

II Review of literature

III Research methodology

IV Presentation and analysis of data

V Summary, Conclusion and Recommendation

Chapter I

It deals with the general introduction of the entire research work.

Chapter II

It deals with review of the Literature, which was obtained during the Library searched.

Chapter III

It deals with the methodology of research work and introduces different tools and models for obtaining the result.

Chapter IV

It deals with the presentation and analysis of data as well as major facts of the study.

Chapter V

It deals with the main summary, conclusion that flows from the study and offers some recommendation as well as suggestion for the further improvement.

CHAPTER TWO

REVIEW OF LITERATURE

This chapter is mainly concern with the past studies regarding to an analysis or the risk and return in common stock investment. Different individuals have conducted a lot of studies or research with different intention on this topic. It refers to the comprehensive review of recent four relevant literatures. The purpose of this chapter is to develop some expertise in once area to see what is discovered, what remains to be discovered and to receive some idea for developing a research design. This study follows the scientific research method. So, it doesn't ignore the past study, data and information. In this regard, so many related academic a case studies are reviewed. But so far nominal research has been performed in this topic in Nepal. Our stock market is emerging state and unable to provide the necessary information concerning to this study.

Some master degree thesis, journals based on Nepal as well as USA is also taken into account. Review of related web site is also viewed. This chapter review about nature of common stock investment, risk and return associated with these assets: concept of decertification and portfolio etc. A part from these independent studies carried out by well– known expert is also taken into consideration.

2.1 Conceptual Framework

Various books relating to theoretical aspects of portfolio management and risk & return are taken into consideration. In this research, risk & return has been taken as special tool to analyze the rate of return that the investment gives.

People, nowadays are seen very much interested towards investing in the shares of various organization. In Nepalese context the major share trading companies are the financial institutions mainly the commercial banks. Besides,

The trading prices of these banks shares are also the highest. But though the shares price of various banks can be observed different, this variety in the market price of shares depends up on the risk of investment and the return the investors get from their investments.

Risk loving investors like to invest on the more risky banks only considering the return they get, whereas the security seeking investors like to invest on those banks shares, which are less risky in terms of the return. Moderate types of investors would like to invest in the medium risk and medium return. So the main focus is given on risk and return.

2.2 Theoretical Review

Risk and return analysis is very important part of investment decision making. Investment decision is made by managers, shareholders and lenders. Return is firstly calculated and then risk is also calculated. Finally, they are compared and an approximate decision made.

2.2.1 Return

Return is the motivating force for the investment. It is also the key method available to investor in comparing the alternative investment. Major purpose of investment is to get a return or income on the funds invested. This rate of return concept is important because it measured the speed at which investor's wealth increases or decreases. The rate of return either can express in terms of rupees or %. Rupees return is the absolute measure. However % return is the relative measure which is more useful for the investment decision. Total return combines both capital gain and the dividend. There are different types of returns they are:

a) Holding period Return

The rate of return which is earned from the investment of common stock during the holding period is known as holding period return. Holding period may be one day one week, one month six month or one year. This rate of return is measured as follows:

$$R = \frac{\text{Ending wealth Z Begining wealth}}{\text{Begining wealth (Or purchase price)}}$$

An investor can obtained two kinds of income from an investment in a share of stock or a bond.

1. Income from price appreciation (or losses from price depreciation), some times called capital gains (or losses). This quantity is denoted as $p_t - p_{t-1}$
2. Regular return or income earned from cash dividend or coupon interest payments represented by C_t.

The sum of these two sources of income (or loss) equals to the change in the invested wealth during any given holding period. The single percentage rate of return formula can be restated in an appropriate form for almost any investment.

$$r_t = \frac{\text{price change } \Gamma \text{ Cash flow (if any)}}{\text{price at begining or the period}}$$

$$= \frac{(p_t \; Z \; p_{t \; z1}) \; \Gamma \; c_t}{p_{t \; z1}}$$

Where,

P_t = Market price at the end of the period etc.

P_{t-1} = Price at the beginning of the period t – 1

C_t =Cash flow income receive during the t period (Francis, 1998:11)

b) Realized rate of Return

The rate of return which is already realized in the past period is known as realized rate of return. It is the fact return, return that was earned or it is historical return.

C) Expected Return

It is the rate of return that is expected to be realized in future. For this, rates of return in the past are used. So it is arithmetic average of returns realized in the past. The expected rate of return must be greater or equals to the required rate of return for the investors to find the investment acceptable (Cheney& Moses, 1993: 34), it is calculated as follows:

$$\frac{\sum_{t\ X1}^{n} R_j}{n}$$

Where,

R_j = Rate of return on stock j.

n = No. of years.

ϕ = Summation.

Investment decisions are based on expectations about future. The expected rate of return for any assets is the weighted average rate or return using the probability or each rate of return as the weight. The expected rate of return is calculated by summing the products of the rate of return and their respective probabilities (Francis, 1998: 11).

2.2.2 Risk

Risk can defined simply as the chance of loss. It is the variation between the expected return and the actual return on common stock or also known as variability of actual return. It arises in uncertain environment. So, it is a part of uncertainty. Risk and uncertainty rate an integral part of investment decision.

Risk can be defined as the situation where the possible consequence of the decision that is to be taken is known. Uncertainty is generally, defined as to apply to situation where the probability can not be estimated. However risk and uncertainty are used interchangeably.

In finance, risk has a special meaning. It refers to the uncertainty associated with return on a particular investment. A risky investment is one whose returns are volatile.

a) Measurement of Risk

There are different types or the statistical tools which we can used to measure the financial risk are as follows;

- Variance ($\pm^2$)
- Standard deviation ($\pm$)
- Coefficient of variation

Standard deviation (S.D.) and coefficient of variation is generally used to measure the risk. The square root of the variance is known as standard deviation (S. d.). S. d. is calculated as follows;

$$\text{S.d. } (\pm) = \sqrt{\text{var}\,iance} \; X \sqrt{\pm^2}$$

Where,

$$\text{Variance } (\pm^2) = \frac{\phi \bullet R \; Z \, E(R)'^2}{n}$$

Or

$$\sum [R - E(R)]^2 \text{ x } P$$

R = Rate of return, E(R) = Expected rate of return

N = No. of observations or years

P = Probability

Coefficient of variation (C.V.), it measures the risk on per unit of return.

Coefficient of variation (C.V.) is calculated as follows

$$\ldots c.v. = \frac{\sigma}{E(R)}$$

Since, higher the value of variances, S.d. and C.V. shows higher risk.

2.2.3 Relationship between the Risk and Return

The relationship between risk and return is described by investor's perception about risk and their demand for compensation. No. investor will take invest in risky assets unless he is assured or adequate compensation for the assumption of risk. Therefore, it is the investors required risk premium that establishes a link between risk and return. There is the positive trade – off between the risk & return. Higher the risk, higher the return and lower the risk lower the return.

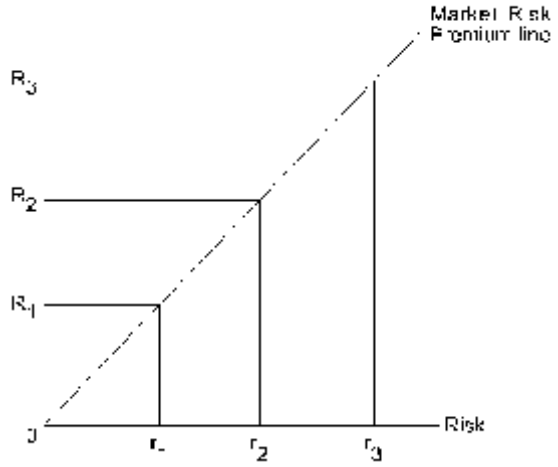


Figure 2.1: Relationship between Risk & return the figure represents a higher premium for higher risk in a linear fashion indicating a premium or R_3 for r_3 degree or risk, R_2 for r_2 and so on bucked by the assumption of linear relationship, the risk premium increases or decreases in proportion to a change in level or risk.

2.2.4 Portfolio Risk

The riskiness of a portfolio is measured by its standard deviation. But unlike expected return it is not the weighted average of the standard deviation of individual securities included in a portfolio. It is because a fundamental idea

implied behind portfolio theory is that riskiness of a single security is completely different from the riskiness of that security held in portfolio. So it is possible for a given security to be quite risk when held in isolation, but not very risky if it is held in a portfolio (Rana, 2000: 120).

The portfolio risk depends not only on the riskiness of the individual security included into portfolio but also on the relationship among those securities. Correlation measure the degree of relationship in which direction two securities move together. The numerical value of correlation ranges from + 1.0 to – 1.0. If two securities tend to move in the same direction, they are positively correlated. If it is negative the securities move in opposite directions. Thus when the return for one security decreases, the return for the other increases the magnitude of the correlation coefficient indicates the degree of relationship between the returns on two securities (Rana, 2000: 190 – 191).

The standard deviation of a portfolio is given by.

$$\pm_p \sqrt{\sum_{i=1}^{n} \sum_{j=1}^{n} Wi\ Wj\ covij}$$

Where,

W_i = Proportion (weight) of investment in security i.

W_j = Proportion (weight) of investment in security j.

Cov_{ij} = co-variance of the returns between security I and security j.

N = Number of security included in a portfolio ±

$\pm_p$ = Portfolio standard deviation.

The above equation can be simplified in case of two assets portfolio as below;

$$\sigma_p \; X \sqrt{W_i^2 \; \sigma_i^2 \; \Gamma W_j^2 \; \sigma_j^2 \; \Gamma 2 W_i \; W_j covij}$$

The co-variance of portfolio is calculated as follows;

$$Cov_{ij} = P_s \sum R_i \; Z E(R_i) * \sum R_j \; Z E(R_j)$$

If we know the correlation coefficient (r_{ij}), then we apply the following relationship for calculating co-variance.

$$Cov\ ij = r_{ij} \; \sigma_i \; \sigma_j$$

$$R_{ij} = \frac{Cov\ ij}{\sigma_i \; \sigma_j}$$

In practice, it is unusual to find the firms or securities with extreme correlation (i.e. + 1 or -1). The correlation does not approach exactly +1 or -1, but ranges between these two extremes, therefore, the risk can be reduced but not totally eliminated by forming a portfolio. But to what extent can the risk be reduced?

This depends on the number of securities included into a portfolio. As depicted in figure 2.2, the total portfolio risk measured by its standard deviation, declines as more & more securities are added to portfolio.

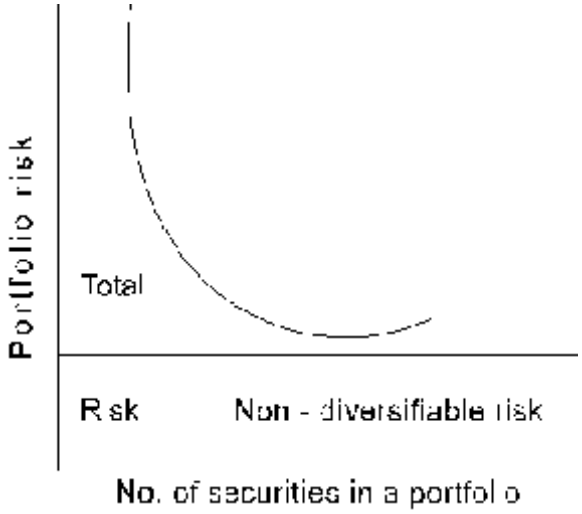


Figure 2.2: impact of number of securities on portfolio risk.

2.2.5 Portfolio Analysis

A portfolio is the combination of two or more than two units with different characteristics. An investment portfolio refers to the investment in two or more assets such as Stocks/Bonds etc. Investors rarely place their entire wealth into a single assets or investment. Rather they construct a portfolio or group of investments, therefore it is needed to extend analysis of risk and return to include portfolio. Portfolio is formed mainly for the reason of minimizing risk on investment in aggregate. It helps to earn the same return at the less amount of risk.

The return on the security could be regarded as being linearly related to a single index like the market index. Therefore, the market index shoulde consist of all the securities trading on the market. However, a popular average can be treated as a surrogate for the market index. Acceptance of the idea of a market index, Sharpe argued, would obviate the need for calculating the thousand of co-variance between individual securities could be attributed to movements in a single underlying factor being measured by the market index. The simplification of the Markowitz model has come to be known as the market model or simple index model (SIM).

The desirability of any securities is direct related to it's excess between to beta ratio. Where the average return is the expected return on the securities, risk less rate of interest is the return on a riskless assets, the beta is the expected change in the rate of return on security associated with a one percent change in the market return. If securities are rank by access return to beta from highest to lowest, the ranking represents the desirability of any securities inclusion in a portfolio. The no. of securities related depends on a unique cut off rate such that all securities with higher ratio of a access return will be included and all securities with lower rate excluded. (Bhalla, 2004: 590-601)

2.2.6 Expected Portfolio Return

It is the weighted average rate of return of an individual security. The expected portfolio return is calculated as follows:

$$E(R_p) = \sum_{i=1}^{n} W_i \, E(R_i)$$

Where,

$E(R_p)$ = Expected portfolio return

i = Security

n = No. of securities in a portfolio

$E(R_i)$ = Expected return on stock i

W_i = Weight of stock i

Thus, the total risk can be classified into two parts: diversifiable (unsystematic) and non-diversifiable (systematic) risk. Hence,

Total Risk = Systematic risk + unsystematic risk.

Diversifiable risk refers to the risk related only to the individual firm. It arises out of strikes, production lost and other activities unique to an individual firm. These events occur independently to any firm. Therefore, diversifiable risk can be eliminated forming a portfolio. Non-diversifiable risks are the result of the general states of economy, monetary and fiscal policy, inflation, which affect all the firm's equally. So, these can not be diversified by forming a portfolio.

Thus, a well-diversified portfolio has only the non-diversifiable portion of total risk. Therefore, only the non-diversifiable risk contributed by a security to the riskiness of a portfolio in which the security is includes (Rana, 2000: 184).

2.2.7 Capital Market Line (CML)

The separation theorem of J. Tobin (1985) states that portfolio consist of risk - free assets and assets on the market portfolio. A rational investor will select an optimal portfolio on the capital market line (CML) which maximizes investor's

preference. Capital market line (CML) represents the equilibrium relationship between the expected return and the standard deviation of efficient portfolios.

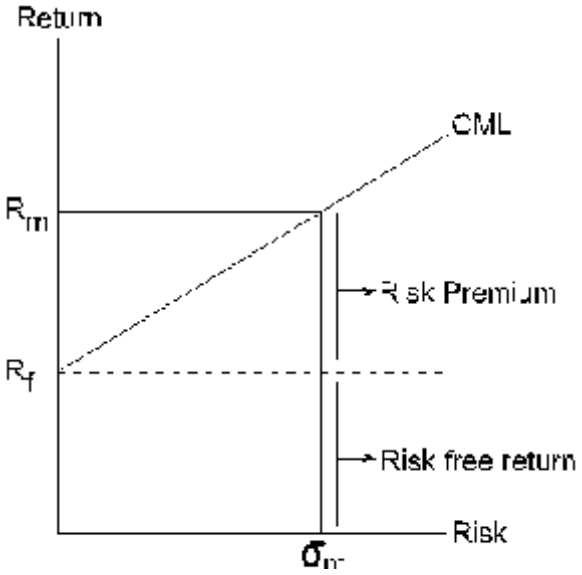


Figure 2.3: Capital market line

The equation for the capital market line (CML) can be expressed as;

$$E(R_p) = R_f + \frac{E(R_m) - R_f}{\sigma_m} \sigma_p$$

Where,

$E(R_p)$ = Expected return on a portfolio

R_f = Risk free rate

$E(R_m)$ = Expected return on a market portfolio

σ_p = Standard deviation of market portfolio

The slope of CML shows the an extra return over the risk free rate of return

$$\text{Slope of CML} = \frac{E(R_m) - R_f}{\sigma_m}$$

a) **A capital asset pricing model (CAPM) and security market line (SML) William F. Sharpe has** presented his famous magnum opus capital assets pricing model in 1961. The CAPM was developed from

portfolio theory as a more practical means of enabling investors to establish the rate of return, which they require from their investment. The model is based upon the concept of risk being analyzed between "systematic" and unsystematic risk". It is assumed that investors are widely diversified and therefore, investors can ignore the unsystematic (specific) risk, as it would be removed by a wide level of diversification. The measure of systematic risk relating to security can be measured by calculating the beta (B) factor for a security. Beta is the relative measure of systematic risk of a given security relative to the risk of the market portfolio. If beta, measuring only the systematic risk is substituted for total risk in capital market line diagram depicted above, the relationship between the return and beta is now called security market line (SML)

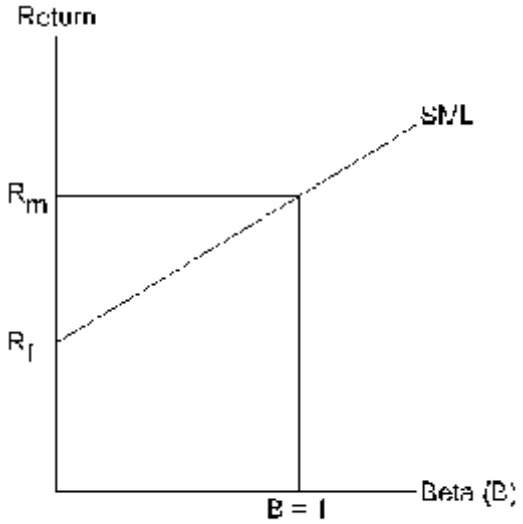


Figure 2.4: Security market line

The above equation showing the security market line (SML), explained by the CAPM is as follows;

$E(R_i) = R_f + [E(R_m) - R_f] b_i$

Where,

$E(R_i)$ = Required rate of return on stock i.

R_f = Risk free rate of return.

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

b_i = Beta or systematic risk index of stock i.

The concept of beta is the ratio of covariance of stock return and market return to the variance of the market return. Beta is an index of systematic risk. Higher value of beta shows the higher systematic risk and lower value of beta shows the lower systematic risk. It can be calculated as follows;

$$b_i = \frac{Cov_{im}}{\pm^2 m}$$

Where,

b_i = Beta of stock i.

Cov_{im} = co-variance between the return of stock of & market return (m).

$\pm^2 m$ = variance of the market return.

Alternatively, the value of beta is calculated as follows;

$$b_i = \frac{\pm_i \mid r_{im}}{\pm m}$$

Where,

b_i = Standard deviation of stock i.

r_{im} = Correlation between the return.

$\pm_m$ = Standard deviation of market return.

2.3 Reviews from Journals

These days information highway or the internet has become to the most easily accessible mediums to gain information in any subject matter. In the study period different web site related to our topic has been viewed some articles related to our topic explained as under.

Do investors dislike risk? In economics in general and investment in particular, the standard assumption is that investors are rational investors prefer certainty to uncertainty. It is easy to say that investors dislike risk but more precisely, we would say that investor's are risk – averse. Risk – averse investors is one who will not assume risk simply for its own sake and will not incur any given level

of risk unless there is an expectation of adequate compensation of having done so,. Note carefully that it is not irrational to assume risk even very large risk, as long as we expect to be compensated for it. In fact, investor can not reasonably expect to earn larger returns without assuming larger risk.

Investors deal with risk by choosing (simplicity or explicitly) the amount of risk they are willing to incur. Some investors choose o incur high levels of risk with the expectation of high level of return. Other investors are unwilling to assume much risk and they should not expect to earn large returns.

We have said that investors would like to maximize their returns. Can we also say that investors, in general, will choose to minimize their risk? No! The reason is that there are cost to minimize the risk specifically a lower expected return. Taken to its logical conclusion, the minimization of risk would result in every one holding risk – free assets such as saving accounts and treasury bills. Thus, we need to think in terms of expected return risk trade – off that result from direct relationship between the risk and expected return of an investment.

Investor need to think about the time period involved in their investment plans. The objectives being purchased may require a policy statement that speaks to specific planning horizons. In the case of an individual investor this could be a year or two in anticipation of a down payment on a home purchase or a life time if planning for retirement. Generally speaking the longer the time horizon the more risk can be incorporated into the financial planning".

The U.S. department of labour, pension and welfare benefits administration states that since 1926, the average annual returns of short – term US treasury bills, which roughly equals the returns of other cash equivalents such as saving accounts has been 3-8 percent. The annual return of long term government bonds over the same period has been 5.3 percent. Large – company stocks on the other hand, have averaged an annual return of 11.2 percent with these statistics available why wouldn't everyone at all times be 100 percent invested in stock? The answer is of course, that while over the long-terms stocks have out performed. There have been many short – term period in which they have

under performed. Add in fact have had negative returns. Exactly when short term periods of under performance will occur is unknown and thus there is more risk in owning stocks if one has short – term horizon than if there exists a long- term horizon."

"The type of equity securities with which most people are familiar is stock. When investors buy stock, they become owner of the company's assets. If a company is successful, the price that investors are willing to pay for its stock will often go up. Shareholders who bought stock at a lower price then stand to make a profit. It a company doesn't do well, however its stock may decrease involve and shareholders can lose money. The rise in the price of the stock is termed appreciation or" capital gain" the stock holder is also entitled to dividends, which may be paid out from the company's profit. Therefore, there have two sources of income from stock investment i.e. dividends & appreciation in the value of investment. Some stocks pay most of their earnings as divided and may have little appreciation. These stocks sometimes referred to as income stocks. Other sometimes referred to as income stocks. Other stocks may pay out little or no dividend, preferring to re - invest the earning with tin the company. Since all the investor's potential earnings come from appreciation. These stocks are sometimes referred to as a growth stocks. Stocks prices referred to as a growth stocks. Stocks prices are also subject to both general economics and industry – specific market factors. There is no guarantee of a return from investing in stocks and hence there is risk, incurred in investing in this type of security. As owners shareholders generally have the right to vote on electing the board of directors and other certain matters of the particular significance to the company. Under the federal securities laws, most companies must send to shareholders proxy statement providing and information on the business experience and compensation of nominees to the board of director and on any other matter submitted for shareholder's vote. This information is required so that stock holders can make an informed decision on whether to elect the nominees or on how to vote on matters submitted for their consideration. Stock investment is typically common stock, which is the basic ownership share of the company. Some company also offers the preferred stock, which is another class of stocks preferred stock typically

offers a certain rate of return (although it is still not guaranteed) and pays dividends before dividend are paid for common stock. If a company does really well, preferred stock holders may received the same dividend as any other year while common stock holders reap the rewards of a great year."

One of the fundamental issues in finance is what the factors are that affect the expected return on assets. The sensitivity of expected return to those factors and reward for bearing this sensitivity. There is a long history of testing in this area and it is clearly one of the most investigated areas in finance.

Almost all of the testing I am aware of involves using realized return as a proxy for expected returns. The use of average realized returns as a proxy for expected returns tend to cancel out over the period of a study and realized returns are therefore and unbiased estimate of expected returns. However, I believe that there is ample evidence that this belief is misplaced. There are periods longer than 10 years during which stock market realized returns are on average less than the risk free rate (1973 to 1984). There are periods longer than 50 yeas in which risky long – terms bonds on average under perform the risk – free rate (1927 to 1981). Having risky assets with an expected return above the risk – free rate is an extremely weak condition for realized returns to be an appropriate proxy for expected return and 11 and 50 years is an and fully long time for such a recent past, the united states has had stock market return higher than 30 percent per year while, Asian market have had negative returns. (Edwin, 1999: 100).

2.4 Review of Publication in the Area

Views expressed by different persons in their articles regarding risk and return of common stock of commercial banks are presented overviewed here in the topic.

Manohar Krishna Shrestha (2049) expressed his view in relation with subject to certain extent with the topic "shareholders democracy and General meeting feedback portfolio Analysis" Shrestha's findings are as follows:

- Top –level decision often by passes the interest of shareholders.

- The annual general meeting has become a plant-form for shareholders to express their opinion and grievance in front of the management and board of directors.

Many general meetings feedback reveals no serious response to the feelings of shareholders. Thus, it reflects, unwillingness of the management and board to change their traditionally held activities towards shareholders.

Radhe Shyam Pradhan (1996) expressed his view in relation with subject to certain extent with the topic. “Stock market behaviour on a small capital markets a case in Nepal”. Pradhan has summarized the following findings.

- Dividend per share and market price per share was positively correlated.
- There are positive relationship between dividend payout and liquidity.
- Higher the earning on the stocks. Larger the portion of dividend per share to market price per share.

Khaogendra Prasad Ojha (2000) in his research paper, “Financial performance and common stock pricing Concludes that "An investment in common of a corporate firm neither ensure annual return nor ensure the return of principle. Therefore investment in common stock is very sensitivity on the ground of the risk. Dividend to common stockholder is paid only if the firm makes an operating profit after tax and preference dividend. The company can return the principle in case of its liquidation only to extent of the residual assets after satisfying to all of its creditors and preferential shareholders. Besides this investor have to sacrifice the return on their investment in common stock which could be earned investing fund else where in the next best opportunity".

Study focused on the financial performance. Where the financial activities involve decision regarding.

- Forecasting and planning of financial requirement.
- Investment decision.
- Financial decision.

Further Ojha added that the stock price in Nepal determined more by other factor's rather than the financial performance of the concerned company.

2.5 Review of Previous Research

Prior to this study various students have regarding the various aspects of risk and returns of the common stock have done several research works. In this study only relevant subject matter are reviewed, which are as follows:

A study done by **Gopal Prasad Bhatta (1995)** in his thesis paper, "Assessment of the performance of listed companies in Nepal" concludes that "A highly significant between risk and return character of the company. Investors expect 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 do the members of stock exchanges try to disseminate the information. So, the market returns and risk both may not show high priced stocks" (Bhatta, 1995:162-172)

A study done by **Mohan Khatiwada (1996)** in his thesis paper **"A study on securities investment in Nepal"** concludes that, 'leaving some exceptional cases aside, almost all the companies experienced that market share price going down by less than fifty percent in 1995. Even the Banking group could not spare the share price going down more specifically; the year 1995 was a disheartening period for the stock price. It is because, almost all the companies share price during the year were own even in some cases below the face value" (Khatiwada, 1996:1-89)

Through the study conducted by Khatiwada did not focus the analysis of individual security and the view point of investors. It explores some dimension to further research in this aspect.

A study done by **Narayan Prasad Acharya (2002)** in his thesis paper "An analysis of risk and return associates with common stock investment of joint venture banks in Nepal" concluded that generally average inventors are risk averse. They prefer to invest on such investment, which provided higher return

at the given level of risk. It is widely known that investment on portfolio generates higher and constants return as compared to single assets. The reason is that the lower return on one asset off set the higher return from other assets. It is obvious that investor can avoid risk by adopting portfolio but the situation in Nepal is different. The evidence shows that most of the investors prefer to invest in single security rather than portfolio. Concept of portfolio should be developed in their mind."

In addition Acharya added, "stock market investment ins not easy. Naturally it is very risk job because return on stock investment is not swell. Chance of heavy loss and gain are fifty. It is more risk in short term than long term so investor must prepare their mentality accordingly.

A study done by **Sangita Thapa** has carried out a research in 2007, in title "risk and return in stock market investment in Nepal: issue and challenges."

The major objectives of study

1. To find out and analyze the risk and return as well as to examine the trend capitulation of twenty three companies out of listed companies. Five companies of each sector form Hotel, trading manufacture, and processing and other from companies are included in this study.

Her research has been based on the collected data from secondary sources as well as some information primary sources (2054/55 to 2062/63). For analyzing data she has applied various statistical totals in her study to find out the risk and return.

The Major Findings of the study

1. Most of the investors are found to be risk averters. They are investing in portfolio having more than four securities.
2. Most preferable sector for investor is banking and finance sectors.

3. Stock brokers are major source of information to the investors which show they have a remarkable role in share market.

Recommendation of the study

1. Increasing trends of share price and surplus money for investors are the influencing factor to buy share by investors.

2. Probability and marketable has equal influence for motivation to investor.

A study done by **Dipak Pokharel** conducted a research in 2008 on the title of "Risk and Return on Common Stock Investment of Commercial Banks in Nepal" on the object he analyzed two representative listed banks. Investment Bank Ltd. and Standard Chartered Bank Nepal Ltd.

The major objectives of study

1. To examine common stock of listed Companies in terms of risk and return.
2. To evaluate risk and return and their portfolio.
3. To suggest the relevant information and practical ideas on the basis of findings.

Major Findings of the study:

1. Nepalese stocks market is emerging state. It development is accelerated after the political change of 1990. The successive government has adopted the policy of openness and liberalization in national economy, which has effected positively in the development of common stock of Nepal. But due to lack of information and poor knowledge, Nepalese individual investors cannot analyze the security as well as market properly.
2. The highest Risk of Common stock may greater possible return.

3. The highest return seen with SCB where as the least return is seen with NIB (two commercial banks taken as analysis).
4. By analyzing the CV, it is found that CV of NIB is highest and the CV of SCB is lowest.

Major Recommendations

1. The CV shows that the return on equity of NIB is fluctuating. Higher variation in return exposes greater risk to investors. Therefore, NIB should try to reduce the variation.
2. While analyzing the covariance of the studies banks, the lowest figure is 13.22% of NIB and the highest figure of 22% of SCB. Therefore, NIB is the best in managing the risk in efficient way among the studies banks.
3. All the two commercial studies bank stocks are under-priced therefore it is recommended that the investors need to buy these stocks.

The level of investor satisfaction toward the present treading system (open out Rye system) has found www. Most investor are not satisfied with it is because whim and rumors influenced every time. Thus most of investor wishes to have automation trading system.

The expected return of securities market as whole by using NEPSE index is 11.72 percent. Banking and other sectors stand higher expected return then market while manufacturing and processing, finance, insurance, hotel and trading sector have lower the expected return compared to the market return.

The specific risk of market during the consideration period of study is 51.65 percent. Banking, Hotel and other sectors have higher specific risk compared to the market specific risk whereas the specific risk of

manufacturing and processing. Finance and insurance sectors are lower then market.

In terms of CV market has 2.70 CV. All sectors have found higher CV in comparison with market relative risk.

In comparison of market portfolio and average return of selected companies shows that there is no difference significantly.

The total paid of value of the all sector expects trading is likely to decreasing in trends. The annual turnover of the all sector is increasing trends. Likewise the market capitalization of sector expected trading is likely to increasing trends.

2.6. Research Gap

The purpose of this study is to draw some ideas concerning to the maintained risk and return and to see what new contribution can be made and to receive some ideas, knowledge and suggestions in relation risk and return of selected commercial banks. . In this context, the previous studies can't be ignored because they provide the foundation to the present study. In other words, there has to be continuity in research. This continuity in research is ensured by linking the present study with the past research studies. It is clear that the reference of new research can't be found on the exact topics, i.e. "Risk Return Analysis on Common Stock Investment (with reference of Commercial banks in Nepal)" therefore to complete this research work, many books, journals articles and various published and unpublished dissertations and field opinion are followed as guideline to make the research easier and smooth through these reference materials. The researcher can find out the gaping from the past research that has to be fulfilled by the present research work. In this regard, here the researcher is going to analyze the different procedure of risk and return analysis of commercial banks.

"Risk Return Analysis on Common Stock Investment (with reference of Commercial banks in Nepal)" is a new topic for the research work. It is expected that the uncovered areas of this research work will be studied. The gapping between old and new research work will be focused and filled up based on the given objectives and limitation in this research.

CHAPTER THREE

RESEARCH METHODOLOGY

Research methodology may be defined as a systematic process that is adopted by the researcher in studying problem with certain objectives in view in other words research methodology describes the methods and process applied in the entire aspect of the study, focus of the data, data gathering instrument and procedure, data tabulating and processing and method of analysis.

This study follows the scientific research methods. Any systematic and organized investigation is known as scientific method. These compare both technical as well as logical aspects. The chapter has been divided in to five parts. First part is research design. Second describes the population and sample, third describes the data collection procedure. Fourth describes the sample characteristics and last deals with data analysis.

3.1 Research Design

The study is based on descriptive and analytical research design. The study is based on recent historical data which covers five years periods from 2001 to 2006. It deals with the common stock investment in joint venture bank on the basis of available information. As the title suggest it is more analytical and empirical and less descriptive. The research has been completed within one year periods.

3.2 Population and Sample

Population of the study is all the listed commercial bank of Nepal. But for the study overall a listed common stock has been considered as the population and samples are the common stock of five listed commercial banks. At present twenty five commercial banks are operating in Nepal. Among them Twenty commercial banks are listed in the NEPSE, among those five banks are taken as sample. They are Bank of Kathmandu (BOK), Everest Bank Limited (EBL),

Himalayan Bank limited (HBL), Nepal SBI Bank Limited and NABIL Bank. The samples are taken randomly. **T**he samples are taken as those banks establishing with in the period 1984 to 1995. The basis for selecting the above mentioned banks only is, few of the banks were not listed in NEPSE during the period under study i.e. 2001 to 2006. Some were listed but later removed temporarily from NEPSE for their internal reason, which if taken under study, would complicate the data analysis and would not reflect the correct data.

The data analyzed are from the fiscal year 2001/02 to 2006/07. At the time of research, though the fiscal year 2007/08 is already over, only few of the banks under study have published their audited financial study. Hence the data of fiscal year 2007/08 is excluded in the research.

Table 3.1 List of all established commercial banks

S.N.	Name	Date of establish	Head office
1.	Nepal Bank Limited	1994	Kathmandu
2.	Rastriya Banijya Bank	2022	"
3.	Agriculture Development Bank	2024	"
4.	NABIL Bank Limited	2041	"
5.	Nepal Investment Bank Limited	2042	"
6.	Standard Chartered bank Nepal Limited	2043	"
7.	Himalayan Bank Limited	2049	"
8.	Nepal SBI Bank Limited	2050	"
9.	Nepal Bangladesh Bank Limited	2050	"
10.	Everest Bank Limited	2051	"
11.	Bank of kathmandu Limited	2051	"
12.	Nepal Credit and Commerce Bank Ltd.	2053	Rupandehi
13.	Lumbini Bank Limited	2055	Narayangadh
14.	Nepal Industrial and commercial Bank Limited	2055	Biratnagar
15.	Machhapuchhre Bank Limited	2057	Pokhara
16.	Kumari Bank Limted	2057	Kathmandu
17.	Laxmi Bank Limited	2058	Birgunj
18.	Siddhartha Bank Limited	2059	Kathmandu
19.	Global Bank Limited	2063	Birgunj
20.	Citizens Bank International Limited	2064	Kathmandu
21.	Prime Bank Limited	2064	"
22.	Sunrise Bank Limited	2064	"
23.	Bank of Asia Nepal Limited	2064	"
24.	Development Credit Bank Limited	2057	"
25.	NMB Bank Limited	2053	"
26.	KIST Bank	2066	"

Development Credit Bank and NMB Bank has been upgrade in commercial bank in 2065.

Kist Bank has been upgrade commercial bank in 2066.

3.3 Data Collection Procedure

Data will be collected from both primary as well as all secondary sources.

3.4 Sample Characteristics

The sample comprises joint venture banks common stock for analyzing data. In addition other listed common stock at NEPSE is also considered as population.

3.5 Method of Data Analysis

The collected data are analyzed by using various financial tools as well as statistical tools, which are given and defined below:

3.5.1 Market Price of Stock (p)

Market price of stock is the basic variable of the study. Among high, low and closing price, each year closing price has been taken as market price of the stock, which has specific time span of one year and the study has in annual basis. Closing price is used as market price of stock. Due to the variance in price with in a year, it is difficult to predict the market price. Although average price could be used as market price. It is also so complicated to collect the day's price of five year period. On the other hand average of high and low privet is assumed not to be reliable and representative information. Therefore, it is appropriate to use closing price as a market price.

3.5.2 Dividend

Dividend is reward to the shareholders. It can be given in the form of cash or shares. It the company declares the dividend in cash, there is no difficulty in calculation. But if the company declares stock dividend or bonus share, shareholders get shares as dividend instead of cash. So, there is little difficulty

to calculate the exact amount in cash of stock dividend the formula for total dividend amount is considered as follows:

Total dividend amount = cash dividend + stock dividend% × Next years MPS

Symbolically,

$$D_T = D_C \ \Gamma \ \frac{SD}{SE} \ | \ P_S$$

Where,

D_T = Total Dividend amount

D_C = Cash dividend amount

SD = Stock Dividend

SE = Existing stock

P_s = Next year's Market price of stock

3.5.3 Return on Common stock Investment (R)

This is the annual realized return received on an investment and any change in market price, usually expressed in a percentage of the beginning price of the investment.

$$R_t = D_t + (P_t - p_{t-1})$$

Where, R_t = Annual realize return on common stock at time t

D_t = Cash dividend received at time t

p_t = Price of stock at time t

p_t = Price of stock time t-1

3.5.4 Expected rate of return on common stock E (R)

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

$$E(R_j) \text{ Or } \bar{R}_j \; X \frac{\Sigma R_j}{n}$$

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

n X No. of years that the return is taken

Σ X Sign of Summation

3.5.5 Standard Deviation (¢)

Standard deviation is a statistical tool and is widely used to measure the risk for holding a single, assets. If standard deviation represents the higher dispersion on return, is more risky and vice versa.

$$\pm_j = \frac{\sqrt{\phi(R_j Z \bar{R}_j)^2}}{n}$$

Where,

σj X Standard deviation of return on stock j during the periods n.

3.5.6 Co-efficient of Variation (C. V)

It is a relative measure of risk. It shows the risk on per unit of return.

It is calculated as follows.

$C.V._J$ = Co-efficient of variation of stock J.

$\pm_j$ = Standard deviation of return on stork J.

R_j = Expected rate of return on stock j.

3. 5.7 Portfolio Return (R_p)

A portfolio is a bundle or a combination of individual assets or securities. The return of a portfolio is equals to the weighted average of the returns of individual assets (or securities) in the portfolio with weight being equal to the proportion of investment in each asset.

$$R_P = \sum_{j\,X1}^{n} w_j R_j$$

Where,

R_p = Portfolio return.

W_j = proportion of investment in stock J

R_j = Return on stock J

N = No of securities included in a portfolio

J = Stock or security J

3. 5. 8 Portfolio Risk (σ_p)

Portfolio risk is measure in terms of variance or standard deviation. The variance (or s.d.) of a portfolio is not simply the weighted average of variance (or s.d.) of individual securities. Portfolio risk doesn't consider only the riskiness of the individual stocks. It is also affected by the association (relationship) of movement of returns of two securities. The portfolio risk (or s.d.) in case of two assets is given below:

$$\sigma p \; X\sqrt{\pm^2_A \; .w^2_A \Gamma \sigma^2_B.w^2_B \Gamma 2.w_A.w._B \sigma_A.\sigma_B.r_{AB}}$$

σ_p = Portfolio standard deviation

$\pm_A^2$ = Variance of return a stock A.

w_A = Weight of A

$\pm_B^2$ = Variance of return on stock B.

w_B = weight of B

$\pm_A$ = standard deviation of stock A

$\pm_B$ = standard deviation of a sock B.

r_{AB} = correlation of stock A and stock B.

3.5.9 Risk minimizing Portfolio

The proportion of investment in two securities included in a portfolio, has the lowest level of risk is known as risk minimizing portfolio. Let's assume there are securities X & Y in a portfolio. We can use the following formula for estimating the optimal weights of securities X & Y:

$$w_x = \frac{\sigma_y^2 - CoV_{xy}}{\sigma^2_x + \sigma^2_y - 2Cov_{xy}}$$

And $W_y = 1 - W_x$

Where,

W_x = weight of x

W_y = weight of y

$\pm_y^2$ = variance of return on stock y

$\pm_x^2$ = Variance of return on stock x

cov_{xy} = co-variance between the return of stock x& y.

3.5.10 Required Rate of return E(R)

It is the minimum % rate of return required by the investor on his investment. If the expected rate of return is greater than the required rate of return, then the investor accept the investment otherwise they reject the investment.

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

Where,

$E(R_j)$ = Required rate of return on stock J

R_f = Risk-free rate of return.

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

bj = Beta coefficient of stock j

3.5.11 Beta Coefficient (b_j)

Beta coefficient is an indicator of systematic risk. It measures the sensitivity of stocks return with respect to the market return.

$$b_j = \frac{CoV_{jm}}{\sigma_m^2}$$

Where,

b_j = Beta coefficient of stock j.

Cov_{jm} = co-variance of stock j and market return.

$\pm_m^2$ = Variance of the market.

3.5.12 Portfolio Beta (b_p)

Portfolio beta is the weighted average of the beta of individual security. It is calculated as follows:

$$b_p = \sum_{j\,X1}^{n} w_j b_j$$

Or

$$bp = b_A w_A \Gamma b_B w_B \Gamma ..... \Gamma b_n w_n$$

Where,

b_p = Portfolio beta

J = stock j

n = No. of securities, included in a portfolio

W_j = weight of proportion of investment in stock j.

bj = Beta of stock j

3.5.13 Correlation Coefficient (r_{xy})

Correlation measures the degree of two securities more together. The numerical value of correlation ranges from +1.0 to -1.0. If the sign is positive, the securities tend to move up and down together If two securities more in the some direction, they are positively correlated. If the sign is negative, they are negatively correlated. That means when the returns of one securities is decreases the return of another securities is increases. The magnitude of correlation coefficient indicates the relationship between the return of two assts. the correlation coefficient can be expressed symbolically as follows:

$$r_{xy} \quad X\frac{Cov\,(x,y)}{\sigma_X.\sigma_y}$$

3.5.14 Partitioning of Total Risk into Systematic and unsystematic risk

Total	Systematic		Unsystematic
Risk=	Risk	+	Risk
$\pm_i^2$	X $_i^2\pm_m^2$	Γ	$\pm_{ei}^2$

Thus, Systematic risk (SR) X $_i^2\pm_m^2$

And, unsystematic Risk = Total Systematic

$\pm_{ei}^2$ = Risk - Risk

X$\pm_i^2$ Z $_i^2\pm_m^2$

Where

$\pm_i^2$ = Variance of ith assets

$_i$ = Beta or systematic risk index of ith assets.

$\pm_m^2$ = market variance

$\pm_{ei}^2$ = unsystematic risk or residual variance

3.5.15 Optimum Portfolio (Sharpe model)

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

Possible cut of rates C

$$C_i \text{ X} \frac{\pm_m^2 \; {}^{i} \; \frac{(\overline{Ri}\,ZT)_{im}}{\pm_{ei}^2}}{1\Gamma\pm_m^2 \; {}^{i} \; \frac{{}^{2}_{im}}{\pm_{ei}^2}}$$

Where,

$\overline{R_i}$ = Expected rate of return of security i

T = Risk free rate

$\overline{R_i}$ ZT = Excess return on security

$_{im}$ = Beta

$\pm^2_{ei}$ = Unsystematic risk

$\pm^2_m$ = market variance

C* = cut off rates.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF DATA

This chapter is the main body part of the study. The chapter includes analysis of data collected and their presentation. Detail data of MPS and dividend of each bank and NEPSE index of each industry is presented and their interpretation and analysis is done. With reference to various readings and literature review in the preceding chapter, efforts are made to analysis and diagnose the recent Nepalese stock market movement, with a special reference to commercial bank. Different Tables and diagrams are drawn to make the result more simple and understandable.

4.1 Analysis of Individual Commercial Bank

As the study has taken of commercial bank. So the common stock of listed commercial banks is analyzed here individually. Among twenty five commercial banks operating in Nepal, only twenty of them are listed in NEPSE, among those study has taken five sample of commercial banks including NABIL Bank Ltd, Himalayan Bank Ltd, Bank of Katmandu Ltd, SBI Bank Ltd, Everest Bank Ltd. Data of FY 2001/02 to FY 2006/07 of each five commercial banks are introduced and their common stocks risk and return are analyzed here.

The study is attempting to include all the available data.

4.1.1 Nepal Arab Bank Ltd (NABIL)

4.1.1.1 Introduction

Nepal Arab Bank limited (NABIL), the first joint venture bank in Nepal, was established in 1984. The Dubai Bank Limited was the foreign partner (50%) to the Nepalese promoter (Financial Institutions) and general public. However, the share owned by Dubai bank limited has been transferred to Emirates Bank of international Ltd, UAE and later on sold to National Bank Ltd, Bangladesh. At present National Bank limited, Bangladesh is managing

the entire banking business under the provision of joint venture agreement (Technical service Agreement between NABIL and National Bank Limited, Bangladesh).

4.1.1.2 MPS, Dividend and EPS

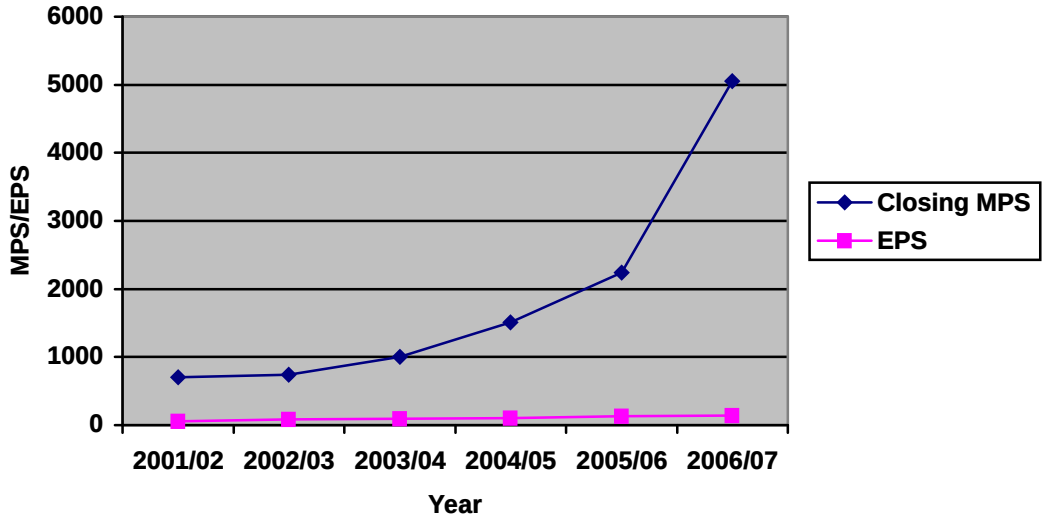
Table 4.1: MPS, dividend and EPS data of NABIL.

Fiscal Year	Closing MPS	DPS	Stock Dividend	Total Dividend	EPS
2001/02	700	30	-	30	55.25
2002/03	740	50	-	50	84.66
2003/04	1000	65	-	65	92.61
2004/05	1505	70	-	70	105.49
2005/06	2240	85	-	85	129.21
2006/07	5050	100	5:2	*2120	137.08

Data source: NEPSE an annual report of NABIL.

*Assume next year MPS is 5050

Figure 4.1: Year –End Price and EPS movement of NABIL



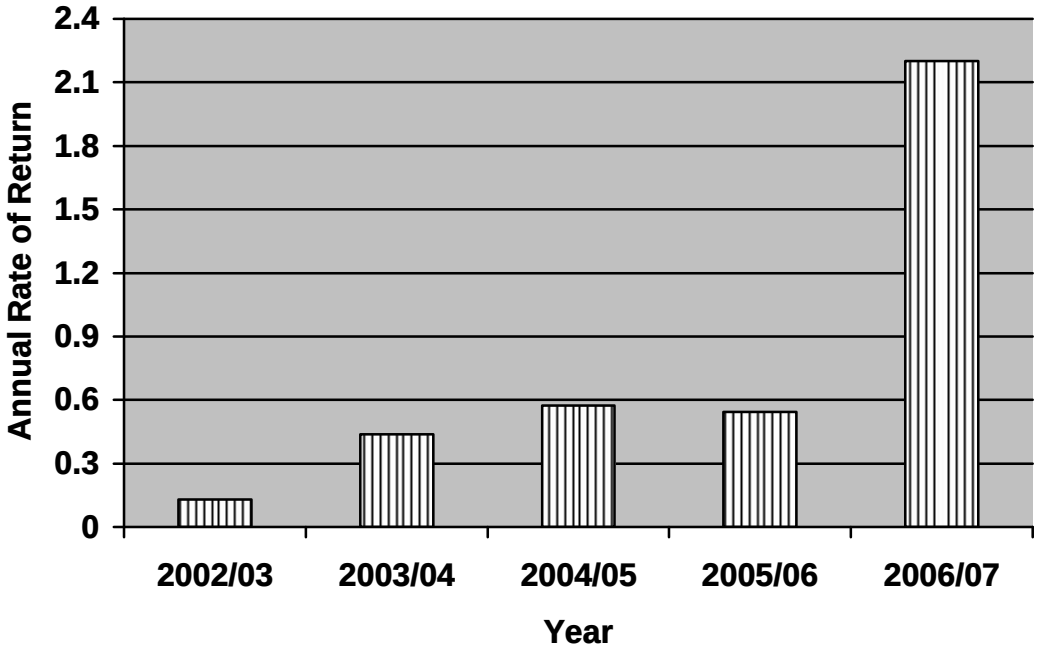
Market price, dividend records and EPS of common stock of NABIL's Bank shown in table 4.1 and MPS and EPS movement is shown in the figure 4.1. Closing price is taken into account for the purpose of calculating realized return for the years. The total dividend includes cash as well as stock (Bonus) dividend. The total dividend is calculated in column five. The model to obtain total dividend is given in preceding chapter, research methodology.

4.1.1.3 Realized Return (*R*), Expected Return $(\overline{R})$ Standard Deviation (±) and coefficient of Variation (*C.V*)

Table 4.2 RRR, ERR, S. D and C.V. of common stock of NABIL.

Fiscal year	Closing MPS	Total Dividend	$R = \frac{P_t - P_{t-1} + D_t}{P_{t-1}}$	$R - \overline{R}$	$(R - \overline{R})^2$
2001/02	700	30	-	-	-
2002/03	740	50	0.1286	-0.6491	0.4213
2003/04	1000	65	0.4392	-0.3385	0.1146
2004/05	1505	70	0.575	-0.2027	0.0411
2005/06	2240	85	0.5449	-0.2328	0.0542
2006/07	5050	2120	2.2009	1.4232	2.0255
Total			R = 3.8886		$(R - \overline{R})^2$ X2.656 =2.6567

Diagram 4.1: Annual Return of Common Stock of NABIL



From the above calculation, it has been shown that the bank has earned higher return in 2006/07 i.e. 220.09% and lower return in 2001/03 i.e. 12.86%.

Return on security consists of the dividend yield and capital gain yield. In our cases the return on security for each year is shown in table 4.2 in column 4. Here year-end price and dividend amounts are used to calculate realized rate of return for each year. It has been shown that the return ranges between 12.86% to 220.09%. The

expected rate of return is the average rate of return. This is 77.77% in our case. This average may deviate from the realized return. Variance and standard deviation of return of a security can be calculated by using the formula given in preceding chapter research methodology. The variance of NABIL is 0.6642 and standard deviations are the square root of the variance is 0.8149. The C.V. of NABIL is 1.0478 which measures the relative risk on per unit return.

4.1.2 Himalayan Bank Ltd. (HBL):

4.1.2.1Introduction

Himalayan Bank limited (HBL) was established in 1991 as fourth joint venture bank collaborated with Habib bank Limited, Pakistan. Meanwhile, the foreign bank has invested 20% of the total equity and remaining by promoters group (51%), Nepalese financial institution (14%) and general public (15%). This is the first joint venture bank managed by Nepalese chief executive. The main business of HBL are to collect the deposits, provide long term and short term loan against collateral and guarantee, inter banking transactions etc. activities.

4.1.2.2 MPS, dividend and EPS data of HBL.

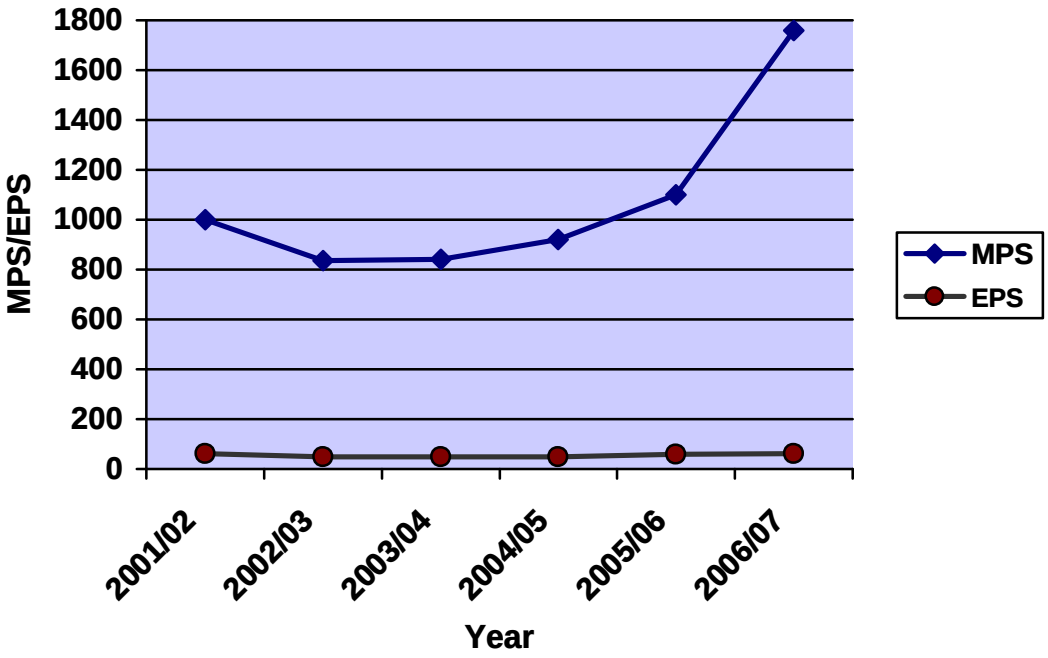
Table 4.3: MPS, dividend and EPS data of HBL.

Fiscal Year	Closing MPS	DPS	Tock Dividend	Total Dividend	EPS
2001/02	1000	25	10:1	108.6	60.26
2002/03	836	1.32	4:1	211.32	49.45
2003/04	840	-	5:1	184	49.05
2004/05	920	11.58	5:1	231.58	47.91
2005/06	1100	30	20:1	118	59.24
2006/07	1760	15	4:1	*367	60.66

Data source: NEPSE and Annual Report of HBL

*Assume next year MPS is 1760

Figure 4.2: MPS and EPS movement of HBL.



Market price, dividend records and EPS of common stock of HBL are shown in Table No. 4.3, MPS and EPS movement is shown in the figure 4.2, MPS of HBL is decreased in 2002/03 to Rs. 836 from Rs. 1000 in 2001/02. After 2002/03, the MPS of HBL is in increasing trend. The MPS is higher in 2006/07 and it is lower in 2002/03.

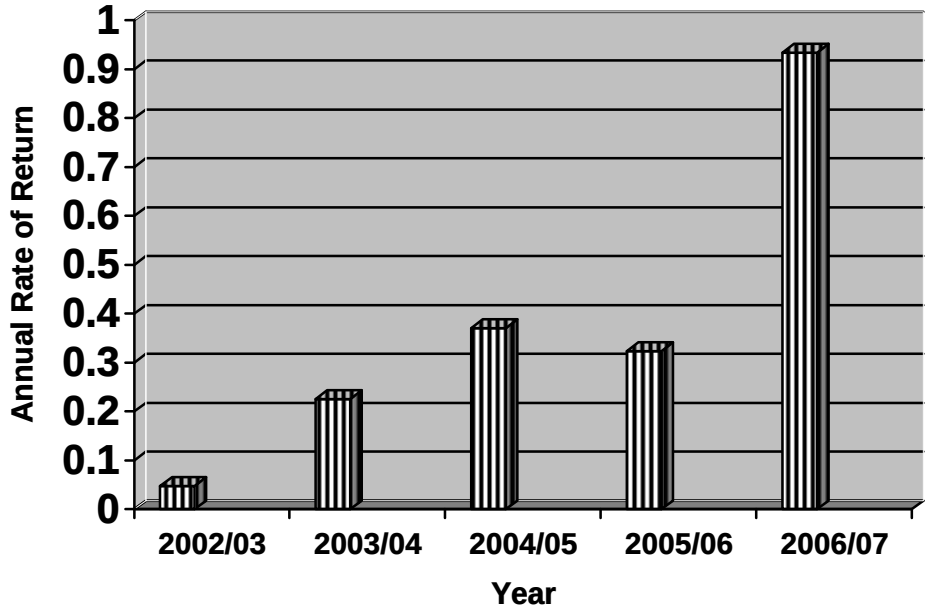
4.1.2.3Realized Return (R), Expected Return ($\bar{R}$), Standard deviation ($\pm$) and co-efficient of variation (C.V.)

Table 4.4 RRR, ERR, S.D. and C.V. of Capital Structure of HBL

Fiscal year	Closing MPS	Total Dividend	$R = \frac{P_t - P_{t-1} + D_t}{P_{t-1}}$	$(R - \bar{R})$	$(R - \bar{R})^2$
2001/02	1000	108.6	-	-	-
2002/03	836	211.32	0.0473	-0.3328	0.1108
2003/04	840	184	0.2249	-0.1552	0.0241
2004/05	920	231.58	0.3709	-0.0092	0.0001
2005/06	1100	118	0.3239	-0.0562	0.0032
2006/07	1760	367	0.9336	0.5535	0.3064
Total			R = 1.9006		$\phi(R - \bar{R})^2$ X0.4446

The following diagram shows the movement of yearly – realized return. The realized return ranges between 4.73% to 93.36%.

Diagram 4.2: Annual Return of common stock of HBL



4.1.3 Bank of Kathmandu Ltd (BOK)

4.1.3.1 Introduction

Book of Kathmandu ltd. was established in 1994 with joint venture of SIAM commercial Bank, Thailand. It was listed in NEPSE in 1998.

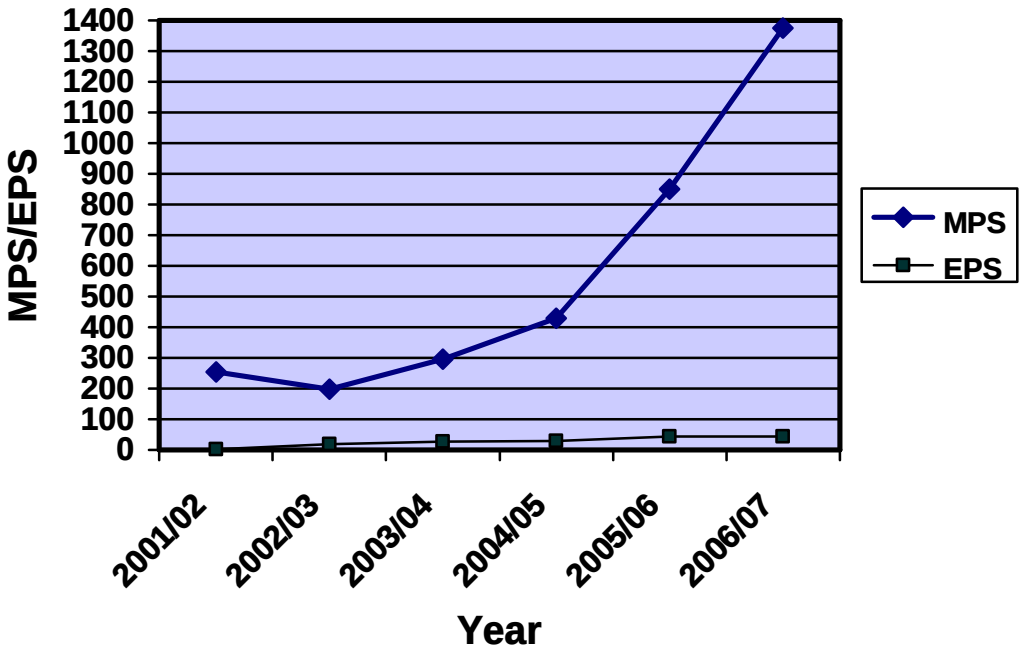
4.1.3.2 MPS, dividend and EPS data of Bok

Table 4.5: MPS, dividend and EPS data of Bok

Fiscal Year	Closing MPS	DPS	Stock Dividend	Total Dividend	EPS
2001/02	254	10	-	10	2.00
2002/03	198	5	-	5	17.72
2003/04	295	10	-	10	27.50
2004/05	430	15	-	15	30.10
2005/06	850	18	10:3	430.5	43.67
2006/07	1375	20		20	43.50

Data Source: NEPSE and annual report of BOK.

Figure 4.3: MPS and EPS movement of BOK



Market price, dividend records and EPS of common stock of BOK are shown in Table No 4.5, MPS and EPS movement is shown in the figure 4.3. The market price is high in year 2006/07 and it is low in year 2002/03. The total dividend is greater in 2005/06. It is due to the stock dividend.

4.1.3.3 Realized return (*R*), Expected Return $(\overline{R})$, Standard deviation ($\pm$) and Coefficient of Variation (*C.V.*)

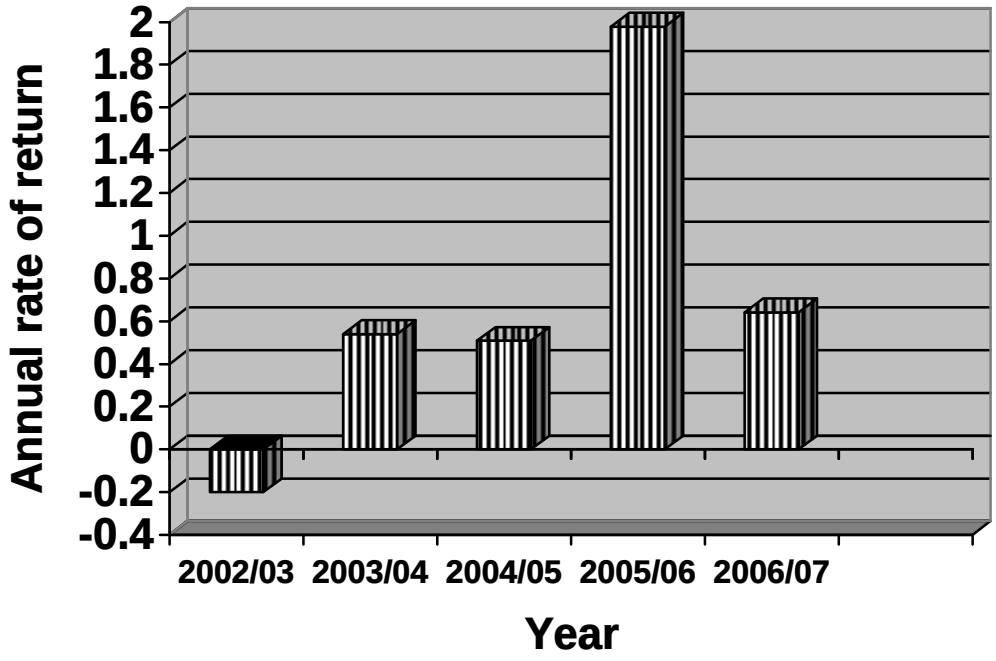
Table 4.6: Shows the calculation of Realized Return (R), Expected Return ($\overline{R}$), standard deviation S.R. ($\pm$) and coefficient of Variation (C.V.)

Table 4.6: RRR, ERR, S.D. and C.V. of Capital Structure of BOK

Fiscal year	Closing MPS	Total Dividend	$R = \frac{P_t - P_{t-1} + D_t}{P_{t-1}}$	$(R - \overline{R})$	$(R - \overline{R})^2$
2001/02	254	10	-	-	-
2002/03	198	5	-0.2008	-0.8942	0.7996
2003/04	295	10	0.5404	-0.153	0.0234
2004/05	430	15	0.5085	-0.1849	0.0342
2005/06	850	430.5	1.9779	1.2845	1.6499
2006/07	1375	20	0.6412	-0.0522	0.0027
Total			R=3.4672		$\phi(R - \overline{R})^2$ X2.5098

The following diagram shows the movement of yearly – realized return. The realized return ranges between– 0.2006 to 1.9779.

Diagram 4.3: Annual Return of common stock of BOK



4.1.4 Nepal SBI Bank Ltd.

4.1.4.1 Introduction

Nepal SBI Bank limited was established in 1993 as a fifth joint venture bank promoted by state Bank of India (50%) and Nepalese institution (20%) where the general public holds (30%) of total equity. The overall management of the bank is handled by the foreign part.

4.1.4.2 MPS, Dividend and EPS data of SBI Bank Ltd

Table No 4.7: MPS, Dividend and EPS data of SBI Bank Ltd

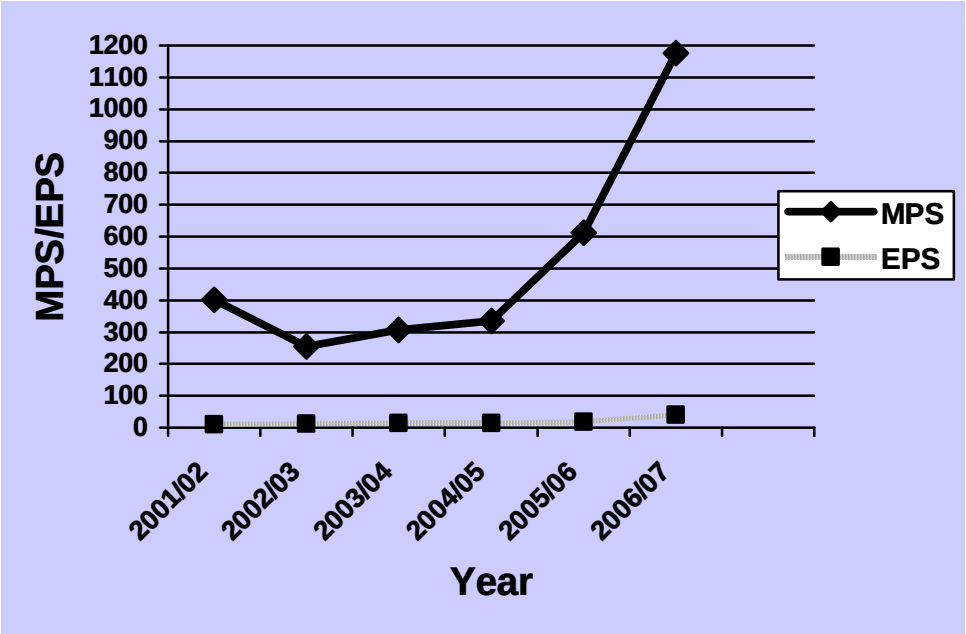
Fiscal Year	Closing MPS	DPS	Stock Dividend	Total Dividend	EPS
2001/02	401	-	-	-	9.61
2002/03	255	8	-	8	11.47
2003/04	307	-	-	-	14.26
2004/05	335	-	-	-	13.29
2005/06	612	5	-	5	18.27
2006/07	1176	12.59	20:7	*424.19	39.35

Data source: NEPSE and annual report of SBI Bank Ltd.

*Assume the next year's MPS is 1137.

From the above Table, it has been observed that the MPS is highest in year 2006/07 as well as in the same year the EPS is highest

Figure 4. 4: Closing MPS and EPS movement of SBI Bank Ltd.



Market price, dividend records and EPS of common stock of SBI Bank are shown in Table 4.7 MPS; EPS movement is shown in the figure 4.4. The SBI Bank has not distributed stock dividend before the fiscal year 2006/07.

4.1.4.3 Realized return (*R*), Expected Return $(\overline{R})$ standard Deviation (±) and coefficient of Variation (*C.V*):

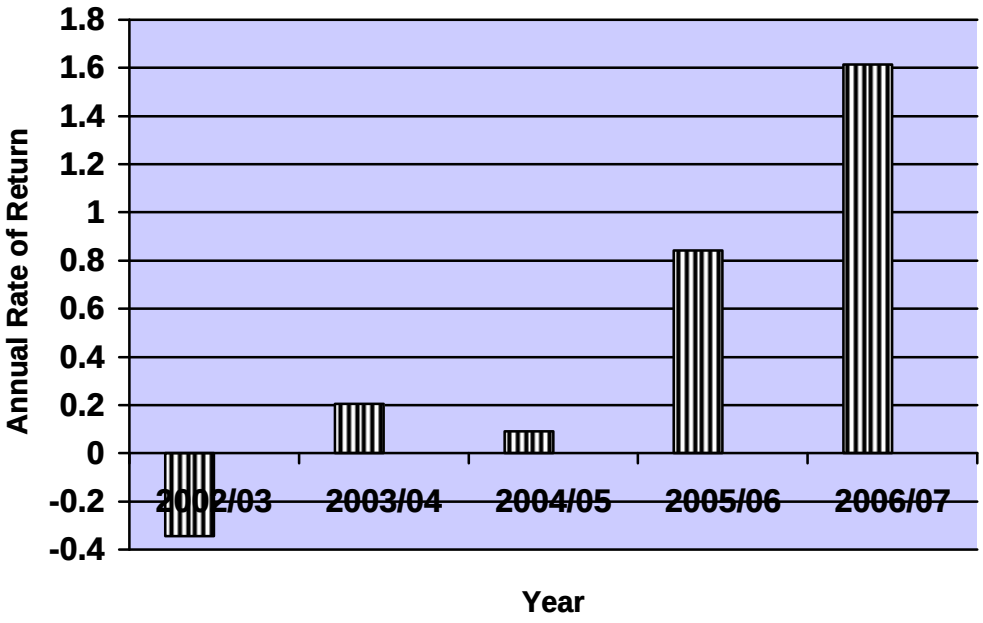
Table 4.8 presents the calculation of annual realized return; expect return, standard deviation and coefficient of variations.

Table 4.8: RRR, ERR, S.D and C.V. of SBI Bank Ltd.

Fiscal year	Closing MPS	Total Dividend	$R \text{ X} \frac{P_t \text{ Z} P_{t\text{Z}1} \Gamma D_t}{P_{t\text{Z}1}}$	$R \text{ Z} \overline{R}$	$(R \text{ Z} \overline{R})^2$
2001/02	401	-	-	-	-
2002/03	255	8	-0.3441	-0.8256	0.6816
2003/04	307	-	0.2039	-0.2776	0.0771
2004/05	335	-	0.0912	-0.3903	0.1523
2005/06	612	5	0.8418	0.3603	0.1298
2006/07	1176	424.19	1.6147	1.1332	1.2841
Total			R = 3.4672		$\phi(R \text{ Z} \overline{R})^2$ X2.3249

The following Diagram shows the movement of yearly– realized return. The realized return ranges between–0.3441 to 1.61447.

Diagram 4.4: Annual Return of common stock of SBI Bank.



4.1.5 Everest Bank Limited (EBL):

4.1.5.1 Introduction

Everest Bank Ltd. was established in 1993 with the joint venture of Punjab National Bank Ltd, India. The main objective of the bank is to carryout commercial banking activities under the commercial bank act 1974. It was listed in NEPSE in 1995.

4.1.5.2 MPS, Dividend and EPS data of EBL

Table 4.9: MPS, Dividend and EPS data of EBL

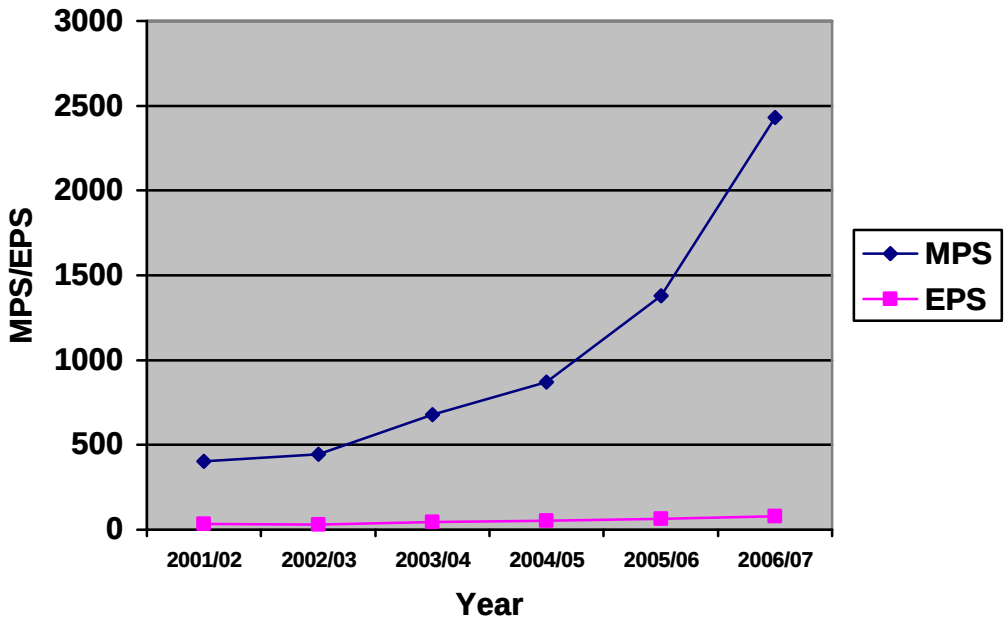
Fiscal Year	Closing MPS	DPS	Stock Dividend	Total Dividend	EPS
2001/02	405	-	5:1	89	32.91
2002/03	445	20	-	20	29.9
2003/04	680	20	-	20	45.58
2004/05	870	-	5:1	275.8	54.22
2005/06	1379	25	-	25	62.78
2006/07	2430	10	5:1	*496	78.4

Data source: NEPSE and annual report of EBL

*Assume the next year Cl. MPS is 2430.

From the above table it has been observed that MPS is increasing trend and MPS is highest in 2006/07 as well as the EPS is also increasing after fiscal year 2002/03.

Figure 4.5: Closing MPS and EPS movement of EBL.



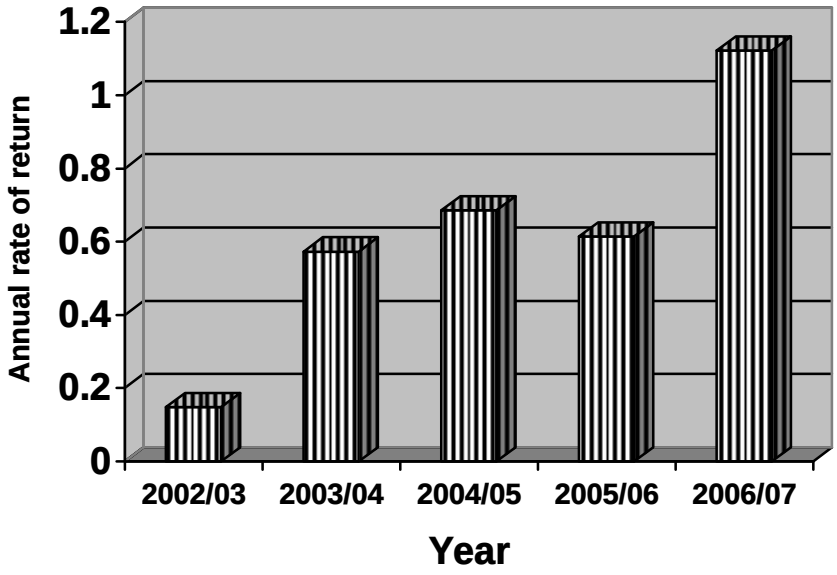
Market price, divided records and EPS of common Stock of EBL are shown in table 4.9. MPS and EPS movement in the figure 4.5.

4.1.5.3 Realized return (*R*), expected return ($\bar{R}$), standard deviation (±) and coefficient of variation (*C.V.*) of EBL

Table 4.10: RRR, ERR, S.D. and C.V. of EBL

Fiscal year	Closing MPS	Total Dividend	$R = \frac{P_t - P_{t-1} + D_t}{P_{t-1}}$	$R - \bar{R}$	$(R - \bar{R})^2$
2001/02	405	89	-	-	-
2002/03	445	20	0.1481	-0.4802	0.2306
2003/04	680	20	0.5730	-0.0553	0.0031
2004/05	870	275.8	0.685	0.0567	0.0032
2005/06	1379	25	0.6138	-0.0145	0.0002
2006/07	2430	496	1.1218	0.4935	0.2435

Diagram 4.5: Annual Return of common stock of EBL



The following table 4.10 shows the calculations of realized return, expected return, standard deviation and coefficient of variation. The realized return ranges between 0.1481 to 1.1218

4.2 Inter– Bank Comparison

According to the result obtained from the section 4.1 and comparative analysis of return, standard deviation of returns, coefficient of variation of each bank for the Fiscal year 2001/02 to 2006/07 are given in table 4.11.

Table 4.11 Expected Return, standard deviation and C.V. of each Banks

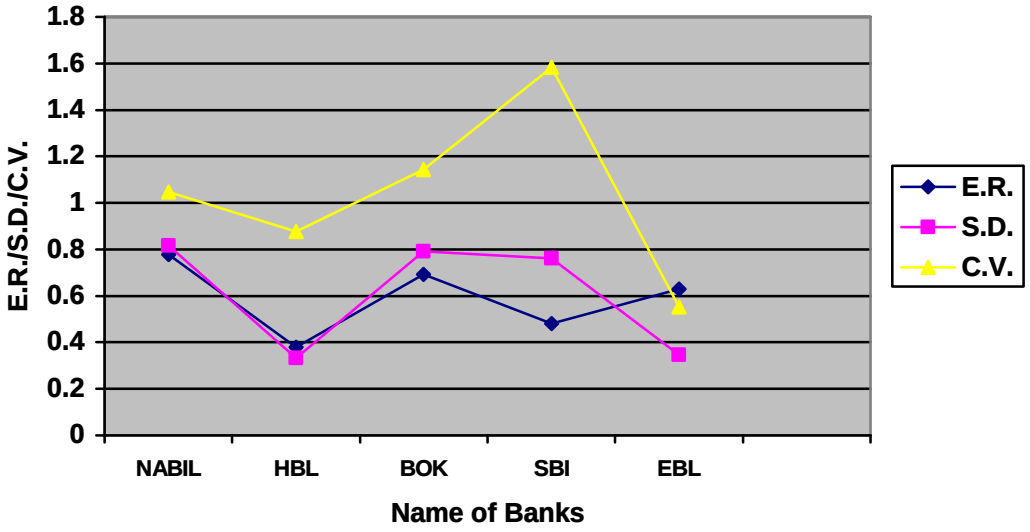
Banks	Expected Return	Standard Deviation	Coefficient of variation	Remarks
NABIL	0.7777	0.8149	1.0478	Highest in terms of return & risk
HBL	0.3801	0.3334	0.8771	
BOK	0.6934	0.7921	1.1424	
SBI	0.4815	0.7624	1.5833	
EBL	0.6283	0.3467	0.5518	Best in terms C.V. & risk

From the above table, it has been shown that NABIL enjoys greater return than other banks but at the same time HBL has lower return. NABIL has higher total risk compensating the higher return where as HBL has the lowest total risk compensating for the lowest return. The evidence proves that "the higher the return, higher the risk and vice-versa". However, if we consider coefficient of variation (C.V.), that risk on per unit of return of SBI is greater i.e.1.5833. Investor of SBI must bear 1.5833 risk to get a unit rate of return. Where as C.V. of EBL is lowest.

To take an investment decision on single assets common stock, coefficient of variation (C.V.) is the most appropriate basis. As per the coefficient of variation (C.V.), invest on the common stock of EBL because it has the lowest risk on per unit of return. So, rational investor should invest on common stock of EBL. Besides this, the investment decision also depends upon personal preferences. In conclusion for a risk taker investor, common stock of NABIL is appropriate. For a risk –averter investor, The C. S. of HBL is appropriate or preferable.

To make the comparison easily understandable figure 4.6: Expected return, standard deviation and coefficient of variation of each bank.

Figure 4.6: Expected return, standard deviation and C.V. of each banks



4.3 Inter –sector comparison

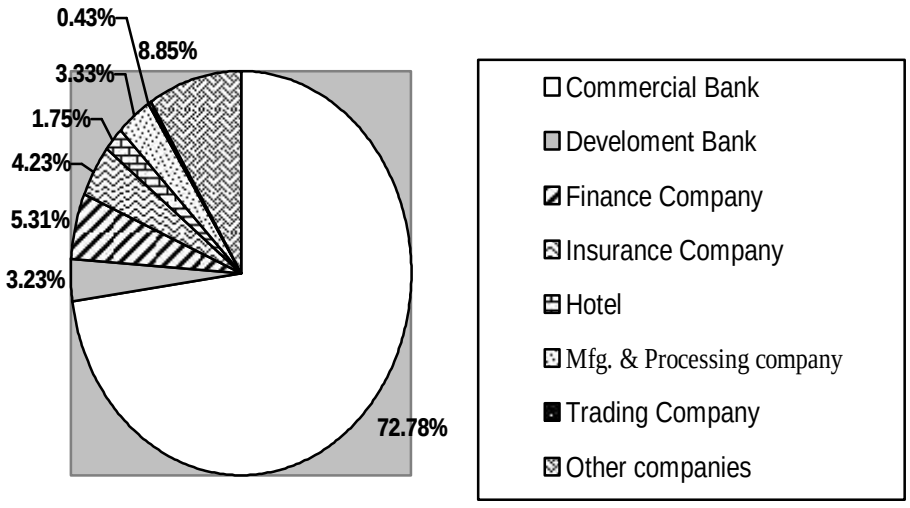
Here a comparison is made on the size of the industry to make the analysis simple as well as understandable for this purpose market capitalization of each industry is taking into account. The following table 4.12 shows market capital of different sector during the fiscal year 2006/07.

Table 4.12: market capitalization of different sector

S.N.	Sector	Market Capitalization (Rs in million	Percent
1.	Commercial Bank	135588.4	72.78
2.	Development Bank	6010.6	3.23
3.	Finance company	9889.3	5.31
4.	Insurance company	8059.8	4.23
5	Hotel	3261.1	1.75
6	Mfg. and Processing company	6200.0	3.33
7	Trading company	796.4	0.43
8	Other company	16495.7	8.85
Total		186301.3	100.00

Source: Annual report, SEBON

Chart 4.1 Market capitalizations. (In percentage)



By the end of the fiscal year 2006/07, the percentage contribution of market capitalization on nominal GDP is estimated to be 27.78. The percentage of market capitalization of "banking sector" on the total market capitalization is highest 72.78% as compared to other sectors and market capitalization of "Trading Company" is very low 0.43%

The following chart presents the market capitalization of listed securities during the fiscal year 2006/07.

Table 4.13: sector wise NEPSE index of different sector during the fiscal year 2001/02 to 2006/07.

Fiscal year	Commercial bank	Finance	Hotel	Mfg	Trading company	Others
2001/02	379.38	318.67	291.34	349.31	115.55	190.9
2002/03	219.35	262.29	216.51	273.67	102.2	77.34
2003/04	199.90	208.14	196.68	250.13	94.56	48.56
2004/05	231.97	195.99	184.41	255.58	95.01	142.61
2005/06	304.64	228.39	178.00	276.50	123.20	347.65
2006/07	437.49	261.37	180.77	301.11	148.11	410.00

As per the above table 4.13, in year 2001/02 the commercial banks index is greater than others. All sector's index has been gradually decreased after the year 2001/02 and it goes up to 2004/05 and 2005/06. The reasons behind to decrease the index of each sector's is the political and economical condition of Nepal. But after the jana-andolon of 2005/06; the index of each sector's is rising up.

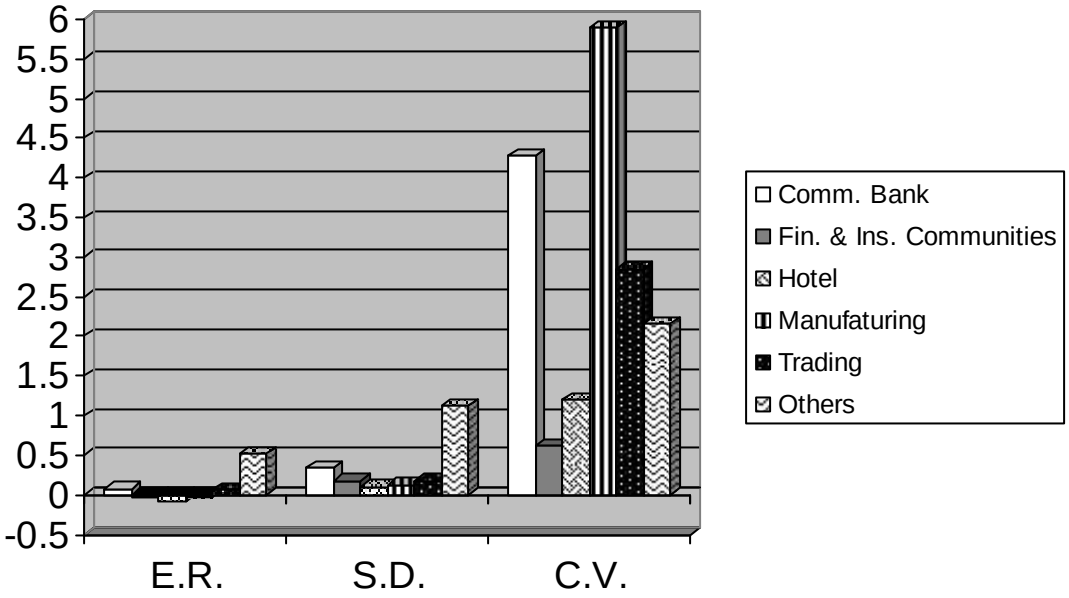
The calculative value of each sector's expected return ($\bar{R}$) standard deviation (±) and coefficient of variation (C.V) is sown in the next table for comparative study.

Table 4.14 Expected retune ($\bar{R}$), standard deviation ($\pm$) and coefficient variation (C.V) of different sectors.

S.N	Name of the company	Expected Return	Standard Deviation	Coefficient of variation
1	Commercial bank	0.0799	0.3421	4.2816
2	Finance & ins.co.	-0.0264	0.1764	6.6136
3	Hotel	-0.08600	0.1032	1.2
4	manufacturing	-0.02196	0.1293	5.8891
5	Trading	0.0627	0.1791	2.8565
6	others	0.5174	1.1185	2.1618

In terms of risk and return, other's sector stands at the first position among the other sectors. Only commercial bank and trading company have slightly positive expected return but remaining the entire sector's have the negative expected return. This means the entire sector's are not performing well.

Diagram 4.6: industry wise expected return, standard deviation and C.V



4.4 Comparison and analysis of market and its return

There is only one stock exchange in Nepal. Nepal Government under programmed initiated to reform capital markets converted securities exchanges centre into Nepal stock exchange in 1983. Nepal stock exchanges in short NEPSE, is a non-profit organization operating under securities exchange Act 1983. The government, NRB and NIDC, owns it. NEPSE prepares daily NEPSE index based on the market capitalization of all listed securities. Overall market movement is represented by market index (i.e. NEPSE index). Market returns, standard deviation and coefficient variations are shown in following table 4.15 NEPSE index movement and market return movement is shown in figure 4.7 and diagram 4.7.

Table 4.15: Market return, standard deviation and c.v.

Fiscal year	**NEPSE Index(NI)**	**R_m =** $\frac{NI_t - NI_{t-1}}{NI_{t-1}}$	$(R_m - \bar{R}_m)$	$(R_m - \bar{R}_m)^2$
2001/02	227.54	-	-	-
2002/03	204.86	-0.0839	-0.3783	0.1431
2003/04	222.04	0.2911	-0.1947	0.0379
2004/05	286.67	0.3494	0.0125	0.0002
2005/06	386.83	0.7681	0.0708	0.0050
2006/07	683.95	$\sum R_m$= 1.3928	0.4895	$\sum (R_m - \bar{R}_m)^2$ =0.4258

Source: SEBON

Figure 4.7: NEPSE Index Movement

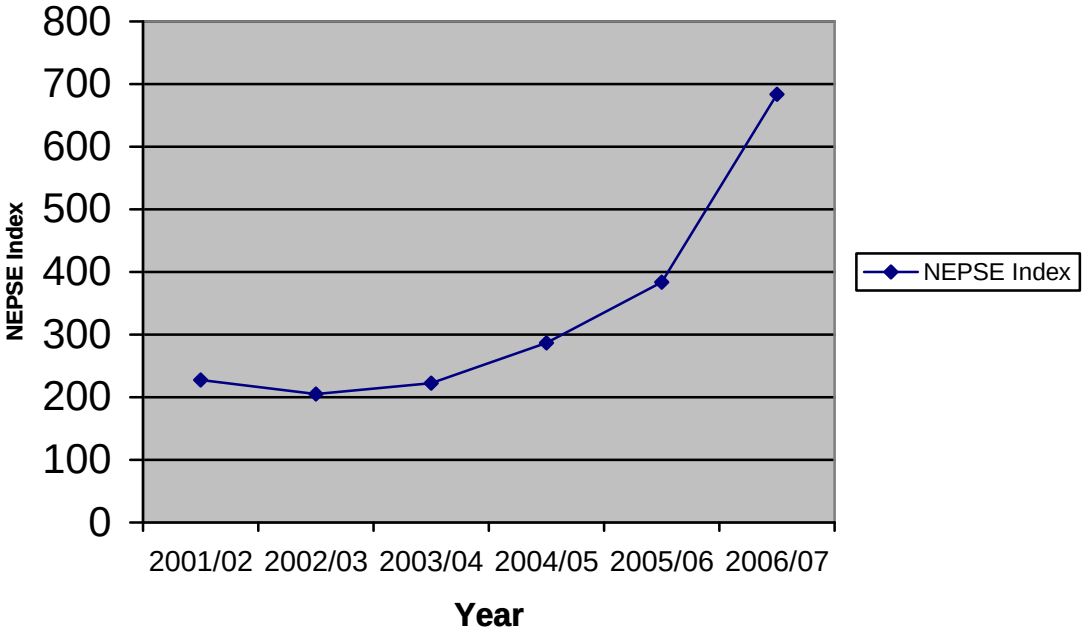
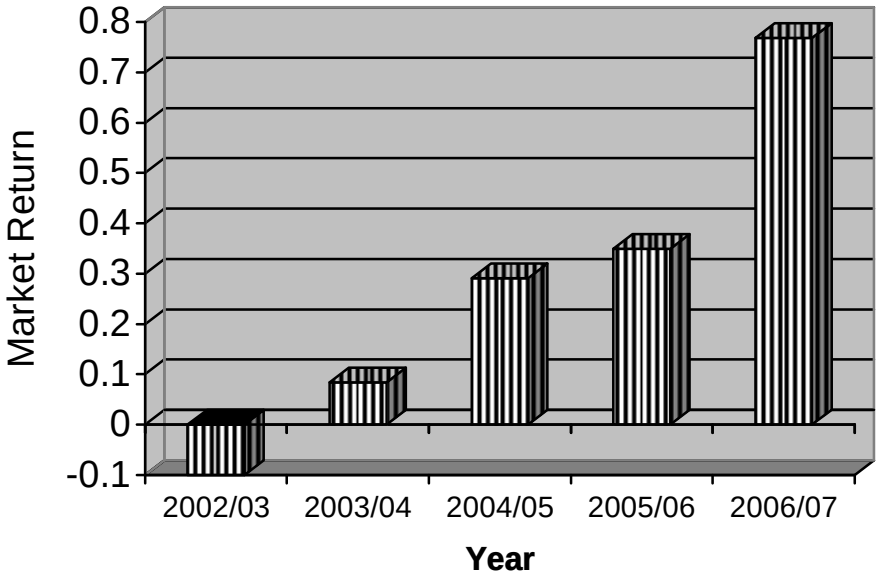


Diagram 4.7: Market Return Movement



The above table and diagram have been shown market return, standard deviation and C.V. comparison between market and industries.

Since, a Diagram 4.7 shows the market return movement in F/Y 2002/03 is negative and after that up to 2006/07 is in positive trend of market movement.

4.5 Market Sensitivity

Market sensitivity of stock is measured by beta coefficient. The systematic risk measured by beta is a degree of sensitivity of stocks return to market movement. Higher the beta represents greater sensitivity and higher reaction to the market movement and Vice- versa. The beta coefficient of market is always 1. The percentage of risk that is correlated with market is said to be systematic portion of risk. As market changes guide this portion of risk, it is out of reach to get under control. Thus beta is systematic risk which can not be eliminated through the means of diversification. Here calculation of Beta coefficient of the common stock of NABIL and other banks are shown in Appendix.

For an individual stock, the beta could be less than equal to or more than 1 depending upon the volatility of those stocks return relative to market return. The different values of beta are defined as: The beta equal to 1 (i.e.B= 1) implies, the average market risk and command the average market risk premium. The beta less than one (i.e.B< 1) implies the stocks is less sensitive to market fluctuation and such stock is considered to be defensive type. The beta greater than one (i.e.B> 1) implies the stock is more sensitive to market movement and such stock is considered to be aggressive type.

If the calculated beta coefficient is less than one (i.e.B< 1) this indicates that one percent change in market return will causes less than one percentage change in stock return. As the same way the calculated beta coefficient is greater than (i.e.B> 1) this indicates that the one percentage change in market return will causes more than one percentage change in stock return.

Table 4.16 Beta coefficient of each bank

Name of the company	Beta coefficient (β)
NABIL	2.3200
HBL	1.0000
BOK	1.0122
SBI	2.2103
EBL	1.0333

The above table shows the beta of different listed commercial banks. Except Himalayan bank limited (HBL), the beta coefficient of others banks are greater than 1. This indicates that one percentage change in the market return will causes more than one percentage change in stock's return.

The beta coefficient of Capital Structure of NABIL Bank ltd. is higher than other banks. That is 2.32 which is greater than 1. Therefore the return of NABIL's stock is highly sensitive with market. 1% increase in market return will raise NABIL's stock return by 2.32%. Similarly HBL, BOK, SBI and EBL have also positive beta, which implies that the stocks return move in the same direction to market.

The status of the pricing of the stocks of particular bank is evaluated by the required rate of return and expected rate of return. If the required rate of return is more than expected rate of return then the stock is called overprice and if expected rate of return is more than required rate of return, then the stock is called under priced. Similarly, if required rate of return equals to the expected rate of return that stock is called equilibrium priced. The table 4.17 shows the price situation of common stock of each bank.

Table 4.17: required rate of return, expected rate of return and price situation.

S.N.	commercial bank	beta coefficient	expected rate of return (ERR)	required rate of return(RRR)	Situation
1	NABIL	2.3200	07777	0.5672	Under priced
2	HBL	1.0000	03801	0.2786	Under priced
3	BOK	1.0122	0.6935	0.2817	Under priced
4	SBI	2.2103	0.4815	0.5432	Over price
5	EBL	1.0333	0.6283	0.2859	Under priced

R_f = 6% [source: NRB]

As per the above table 4.17, the common stock of NABIL, HBL, BOK and EBL is under priced because the ERR>RRR. So the common stock of NABIL,

HBL, BOK and EBL's should be buy rather than selling. At the same time, the common stock of SBI is overpriced because ERR<RRR. So, that common stock should be sell rather than buying.

4.6 Correlation

Correlation is a relative measure of relationship that is bounded by 1.0 and -1.0. It is statistical measure of the extent to which the returns on any two securities are related, however, it denotes only association not causation. Covariance and correlation are closely related. The correlation measures the degree of relationship of movement of securities return. Correlation is measured by the following equation:

$$r_{ij} = \frac{COV(R_i, R_j)}{\pm_i \pm_j},$$

Now the correlation of NABIL's common stock to another commercial bank's common stock is shown in table 4.19

Table 4.18: Correlation Between Nabil and Others

S.N.	Commercial banks	Correlation (r)
1	NABIL and HBL	r_{NH}=1.00
2	NABIL and BOK	r_{NB}=0.11
3	NABIL and SBI	r_{NS}=0.91
4	NABIL and EBL	r_{NE}=0.91

As per the above table, the correlation of the NABIL and HBL return is perfect positives. This means they tend to move in same direction. So portfolio made with these stocks is most risky. Besides this the correlation of NABIL with SBI and EBL is high degree of positive correlation (i.e. 0.91). But correlation of NABIL and BOK is low degree of positive correlation. This means the correlation of NABIL's with other commercial banks is positive but degree of relationship is different.

4.7 Portfolio Analysis

Portfolio indicates the combination of more than one asset with different characteristics. The idea of portfolio is relevant when taking decision about the investment. Investor can diversify their unsystematic risk by adopting portfolio. It will be a great use to reduce risk to some extent. The portfolio earning of an assets measured by expected returns of portfolio i.e. E (Rp), risk by the standard deviation of portfolio i.e. ($\pm_p$). The expected return of portfolio is simply a weighted average of the expected return of individual securities held in the portfolio. The weights are equals to the proportion of total fund invested in each security.

The portfolio theory has two assumption (i) investors are risk averse (ii) the return of securities are normally distributed. This means the mean and variance analysis is the foundation of portfolio decision.

4.8 Analysis of Diversification

The analysis is based on two assets portfolio and the tools for analysis are already mentioned in the research methodology. It is already stated that correlation between the return of the two securities plays a vital role in risk reduction by portfolio construction. The negative relationship between two returns is acceptable in portfolio return. If the correlation is perfectly negative (-1), Then the combination of securities reduces unsystematic risk to zero. If correlation is perfectly positive or equal to 1 then the portfolio can not reduce any part of risk. Now we analyze the portfolio risk and return of NABIL's with other's commercial banks which is shown in the table 4.19.

Let's assume, the portfolio made with NABIL and HBL's Capital Structure = A

the portfolio made with NABIL and BOK's Capital Structure = B

the portfolio made with NABIL and SBI’s Capital Structure = C

the portfolio made with NABIL and EBL's C.S = D

Table 4.19: portfolio return, risk and c.v. of different banks with NABIL's stock.

security	portfolio	portfolio return	±Portfolio risk (± P)	Portfolio c.v.	
NABIL& HBL	A	0.1216	0.0952	0.7829	
NABIL &BOK	B	0.7339	0.5997	0.8171	Best in terms of risk& return
NABIL &SBI	C	0.5319	0.7599	1.4287	
NABIL & EBL	D	0.5536	0.2279	0.4117	Best in terms of c.v.

As per the above table portfolio B is best in terms of risk and returns because it provides the highest portfolio return i.e. 73.39% at portfolio s.d. i.e. 59.97%. But in terms of c.v. Portfolio D is best because it provides the low amount of risk on per unit of return. So rational investors invest on portfolio D. However a risk - lover investor invest on portfolio B to get the highest return.

4.9 Systematic and unsystematic risk and its proportion

Systematic risk is the part of total risk and can not be diversified through the creation of portfolio. This risk creates from the systematic factors or market factors or macro economic factors like inflation, GDP, interest rate etc. It affects to the all company's common stock equally. However, unsystematic risk is diversifiable risk and can be minimized through the creation of portfolio. This risk creates from micro economic factors or unique factors to a company like inefficiency, Strikes sales policy, production policy etc.

The proportion of systematic and unsystematic risk indicates the percentage of systematic risk created from systematic or market factors and percentage of unsystematic risk created from company related factors.

Table 4.20 Systematic and unsystematic risk and it's proportion

Stock	Systematic risk	Unsystematic risk	Proportion of systematic risk	Proportion of unsystematic risk
NABIL	0.5683	0.0958	0.8557	0.1443
HBL	0.1065	0.0048	0.9568	0.0432
BOK	0.1091	0.5184	0.1738	0.8262
SBI	0.5203	0.0609	0.8952	0.1048
EBL	0.1137	0.0064	0.9467	0.0533

The above table shows the systematic and unsystematic risk and it's proportion of different listed commercial bank's common stock. The proportion of systematic risk of Capital Structure of HBL is higher than other banks i.e. 95.68%. This means it indicates that out of total risk on stock of BHL's 95.68% is undiversifiable risk and created from systematic factors or market factors and the remaining 4.32% risk is diversifiable created from company related factors as well as the proportion of systematic risk of stock of BOK is lowest i.e. 17.38%. This means the remaining 82.52% risk is diversifiable risk created from the company related factor's such as management inefficiency, strike, company's other different policies and such extras.

4.10 Optimum Portfolio Construction (Sharpe Model)

Optimum portfolio is that combination of investment in assets which helps an investor to minimize risk if return is same or to maximize return if risk is same.

$$\frac{\overline{R}_i \; ZT}{B_i}$$

Where $\overline{R}_i$ = expected rate of return on stock

T = Risk free rate of return

β = Beta |

Table No. 21 Ranking the stocks on the basis of excess return to beta

Ranking	Banks	Exp. Return $\overline{R_i}$ (%)	Excess. Return $\overline{R_i}$ -T (%)	Beta (B_i)	Unsystematic Risk ($\pm^2_{ei}$)	Excess Return to Beta $[(\overline{R_i} ZT)/B_i]$
IV	NABIL	77.77	71.77	2.32	908	30.9353
III	HBL	38.01	32.01	1	48	32.01
I	BOK	69.34	63.34	1.0122	5184	62.5765
V	SBI	48.15	42.15	2.2103	609	19.0698
II	EBL	62.83	56.83	1.0333	64	54.9985

Where T (Risk free rate) = 6%

4.10.1 Establishing a cut-off rate

All securities whose excess return to risk ratios are above the cut-off are selected and all those whose ratios are below are rejected. The value of C* is computed from the characteristics of all of the securities that belong in the optimum portfolio. To determine the C* it is necessary to calculate its value as if different number of securities were in the optimum portfolio. Suppose C_i is a candidate for C*, the value of C_i is calculated when i securities are assumed to belong to the optimum portfolio. For the portfolio of i stocks, cut-off rate is calculated by using the following formula.

$$C_i = \frac{\pm^2_m \sum_{iX1}^{i} \frac{(\overline{R_i} ZT)B_{im}}{\pm^2_{ei}}}{1\Gamma\pm^2_m \sum_{iX1}^{i} \frac{B^2_{im}}{\pm^2_{ei}}}$$

Where,

C_i = cut-off rate of stock i.

$\pm^2_m$ = market variance.

$\pm^2_{ei}$ = unsystematic risk

Table No. 22 Calculation of determining cut-off rate

Ranking	Banks	$\frac{(\overline{Ri}\ ZT)}{B_i}$	$\frac{(\overline{Ri}ZT)B_{im}}{\pm^2_{ei}}$	$\frac{B^2_{im}}{\pm^2_{ei}}$	$\sum_{i=1}^{i} \frac{(\overline{R_i}\ ZT)B_{im}}{\pm^2_{ei}}$	$\sum_{i=1}^{i} \frac{B^2_{im}}{\pm^2_{ei}}$	C
I	BOK	62.5765	0.0124	0.0002	0.0124	0.0002	10.8786
II	EBL	54.9985	0.9175	0.0167	0. 9299	0.0169	52.1249*
III	HBL	32.01	0.6669	0.0208	1.5968	0.0377	41.3252
IV	NABIL	30.9353	0.1834	0.0059	1.7802	0.0436	39.9687
V	SBI	19.0698	0.1529	0.0080	1.9331	0.0516	36.7930

Stocks are ranked from the highest excess return to beta to lowest; we know that if a particular security belongs in the optimum portfolio all higher ranked securities also belong in the optimum portfolio. We proceed to calculate values of a variable C_i as if the first ranked security were in the optimum portfolio (i = stock of BOK) then the first and second stocks were in the optimum portfolio (i=stocks of EBL) and soon. This C_i are candidates for C*. We have to find out the optimal C_i, that is, C* when all stocks used in the calculation of C_i, have excess return to beta above C_i and all stocks not used to calculated Z_i, have excess return to beta below $C_{i..}$

In particular, C* is the only C_i that when used as a cut - off rates selects only the stocks which have the excess return to beta above the C* in the construction of an optimal portfolio. There is only one C_j with highest, is C*.

4.10.2 Optimum Portfolio

Once we know which securities are to be included in the optional portfolio, we must calculate the present invested in each security. The percentage invested in each security is calculated by using the following formula:

$$X_i \ \mathrm{X} \frac{Z_i}{\sum_{i=1}^{i} Z_i}$$

Where,

$$Z_i \ X\frac{B_i}{\pm^2_{ei}} \ \frac{(\overline{R}_i \ ZT)}{B_i} \ ZC^*$$

X_i = Proportion of invest able funds in security i.

The residual variance on each security $\pm^2_{ei}$ plays an important role in determining how much to invest in each security. By using the formula;

Now, dividing each Z_i by the sum of Z_i, Then we can find out the percentage of fund invest of stock of BOK and EBL as respectively.

Since as per the optimal portfolio, in order to maximize the return and minimize the risk invest 4.34 percent of fund on the stock of BOK and 95.68 percent of fund on the stock of EBL.

4.11 Major findings of the study

- The expected return on common stock of NABIL is maximum i.e. 77.77%, which is very high rate of return. Similarly, the expected rate of return of the Capital Structure of HBL is found minimum i.e. 38.01 % other common stock having higher return of the Capital Structure of BOK, EBL and SBI is 69.35%, 62.83% and 48.15% respectively on the basis of sector wise comparison, the expected return of other sector is found higher i.e. 51.74 % and that of Hotel sector is found negative i.e. -8.6%.
- The S.D. of HBL is lower i.e. 0.3334 & that of NABIL is higher i.e. 0.8149. So, the HBL Capital Structure is low risky whereas NABIL's Capital Structure is high risky. The S.D. of Capital Structure of BOK, SBI and EBL are 0.7921, 0.7624, and 0.3467 respectively. According to sector wise comparison, the S.D. of other sector is found higher i.e. 1.1185 and that of Hotel sector is found lower that 0.1032.
- The C.V. of EBL is lower that 0.5518 where as the C.V. of SBI is found higher that 1.5883, the other common stock having higher C.V. of

common stock of BOK, NABIL and HBL is 1.1424, 1.0478 and 0.8771 respectively.

- In the context of market capitalization, the banking sector contributes the highest proportion i.e. 72.78% and the trading sector contributes the lowest proportion i.e. 0.43%, similarly, the market capitalization of the development bank is 3.23%, finance company is 5.31%, insurance company is 4.33% and the hotel, mfg. and other company's is 1.75%, 3.33% and 8.85% respectively.
- In the context of market sensitivity, the return of Capital Structure of NABIL is found highly sensitive to the market during the study period. It is because that it has high beta i.e. 2.32which is greater than 1. Similarly, the Capital Structure of HBL, BOK, SBI and EBL have positive and greater than 1 beta, which implies that, the stock return move in the same direction but more then market return.
- By evaluating pricing situation for Capital Structure of five banks, it has been found that all C.S's expected rate of return is greater than required rate of return except SBI Bank ltd. So except SBI, all the bank's stock price is found undervalued. But the SBI's stock price is found overvalued because; required rate of return is greater than expected rate of return.
- According to the correlation coefficient of NABIL's with other banks capital structure is found >0 and ™1. It implies that the return of the NABIL's Capital Structure and other bank's C.S moves in the same direction.
- The expected portfolio returns on portfolio B (i.e. of NABIL and BOK) is maximum i.e. 73.39% which is high rate of return. Similarly, the expected portfolio rate of return of portfolio A is found minimum i.e. 12.16%. Other portfolio having higher rate of return is C and D with 53.19% and 55.36% respectively.
- The portfolio S.D of portfolio A is lower i.e. 0.0952 and that of C is higher i.e. 0.7599. So, the portfolio A is low risky whereas portfolio C is

high risky. The portfolio S.D. of portfolio B and D are 0.5997 and 0.2279 respectively.

- The C.V. of portfolio D is lower i.e. 0.4117 whereas the C.V. of portfolio C is higher i.e. 1.4287. The other portfolio's having the higher C.V. is A and B that is 0.7829 and 0.8171 respectively.
- The proportion of unsystematic risk of BOK is higher than the other commercial banks i.e. 82.62 percentages. So, the bank must review its managerial inefficiency, advertising campaign, banks policies and others.
- In order to determine an optimal portfolio, investor should invest 4.34% available fund on stock of BOK and 95.66 on stock of EBL respectively.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary:

Risk and return analysis is the Fundamental part of Investment decision. Investment decision is not a gamble and joke, but it is seriousness. It contains the different types of process as well as fundamental and technical analysis. Investment decision is made by the shareholders, creditors and managers. For making the investment decision, at first, Return is calculated and associated risk is also calculated. Finally, they are compared and a rational investment decision is made.

Therefore in recent days, risk and return is the central focus of finance. Before investment on any securities the risk and return analysis is performed. Being the speculative nature, common stock is taken for analyzing risk and return.

The common stock is most risky security. An investment in common stock of a company can not ensure the annual return and the return of the principal. Dividends are paid to stockholders only if there will be earning available to equity shareholders. In Nepal, there are not various types of securities but due to the development of banking industry and manufacturing industry, there is sufficient common stock for attracting Nepalese investors. Nepalese stock market is in emerging state. After restoration of democracy in 1990, it's developing is acceleration. After the Jana-andolan 2, the performance of stock market has been improved which is showed by the increasing trend of NEPSE index.

There is deep relationship between risk and return. Risk and return plays a vital role in the process of investment. However, the relationship between risk and return is described by investor's perceptions about risk and their demand for compensation. The investors will invest in risky assets only when he is assured of adequate compensation for risk bearing.

The main objective of this study is to analyze the risk and return on common stock investment of Nepalese stock market and it is focused on common stocks of five commercial banks listed in Nepal stock Exchange Limited. In the course of this study, brief review of related studies has been performed. The collected secondary data has analyzed by using scientific methods and the tables, graphs, diagrams have used to present the data more clearly. The secondary data were collected from the NEPSE and concerned banks, security Board of Nepal, NRB and journals. Both quantitative and qualitative analysis has been made to derive the conclusion.

5.2 Conclusion

- The stock which has the highest risk has also the highest return and the stock which has the lowest risk, has also the lowest return.
- As per the risk bearing capacity, the investor's natures are different. A risk lover/taker investor invests on those stocks which has the highest risk as well as highest return. A medium investor invests on those stocks which have the medium risk and medium return. Similarly a risk avoider investor invests on those stocks which have low risk and low return. But a rational investor invests on those securities which has the highest return at lowest risk.
- Most of the Nepalese private investor invests in single security. Some of the investor uses their fund in two or more securities. But it is found that they don't make any analysis of portfolio before selecting. They invest their fund in different securities on the basis of expectation and assumption of individual security rather than analysis of the effect of portfolio.
- The stocks were yielding unusually high return with respect to the amount of the systematic risk they bear during the study period. So the high return makes the stock undervalued and in future the demand for those stocks will increase and the price of the stock will further increase for the equilibrium state.

- Most of the Nepalese investors are not awareness about the stock market, among them who were awareness see stock market investment as the black art. So, it is the market for only rich and large type of investor, but it doesn't consider the small type of investor's investment for safety.
- This study enables investor to put the return they can expect and the risk they can take into better respective.
- As Nepalese investors do not seems so professionalism in respect of trading of shares, they are holding shares for dividend and further price appreciation and only few investors are seeking for price on regular basis. Further, Nepalese investors are getting the less return from their investment however this much is higher than other sector's. The involvement of trading activities in stock market seems increasing in trend now a day.

5.3 Recommendations

Mainly this study is made for the partial fulfillment of M.B.S level. However, this study may be helpful for the individual investors. The following recommendations are prescribed on the basis of data analysis and major findings of this study.

The recommendations based on major findings are offered as follows:

- Investor who wants high return should invest in NABIL, BOK, & EBL's common stock, irrespective of risk.
- Risk adverse investor (investors who don't want to take higher risk) should invest in HBL & EBL's common stock.
- To minimize risk on 1 percent return, investor should invest in HBL & EBL's common stock.
- So, there is positive relationship between risk and return. Therefore the investor should select riskier bank to get higher return and less risky bank to get lower return.

- Investors who want high portfolio return should invest between the banks NABIL and BOK, NABIL and EBL, irrespective of risk.
- The portfolio assets which has been made in the study, has the positive return therefore the investor can select these assets for portfolio.
- Risk averse investor should make the portfolio of banks between NABIL and HBL and NABIL and EBL's common stock respectively.
- To minimize the portfolio risk on 1 percent portfolio return, investors should make portfolio between the banks NABIL and EBL, NABIL and HBL and NABIL and BOK's common stock because the coefficient of variation of these portfolios is less than NABIL and SBI.
- As per the study, Except SBI's common stock, the common stock of NABIL, HBL, BOK & EBL's are under priced. So these stocks should be buying and overvalued common stock of SBI's should be selling.
- We recommend the investors to invest 4.34% and 95.66% of available fund on stock of BOK and EBL respectively in order to maximize the return and minimize the risk.

Recommendations based on overall study are as follows:-

- The activities of stock market should not centralize only in Kathmandu valley. So the brokers should be encouraged to generate their business from outside the Kathmandu valley and they should suggest the investors to make suitable portfolios.
- Monitoring system for the listed companies should be implemented properly.
- Investor's education, awareness and confidence towards stock market should be uplifted by providing various annual reports, books, bulletins with regular publication.
- Investor's who involve in the trading of shares should have the general knowledge about national & international economic condition, taxation

policy of government, peace & political situation is necessary which affect's the price of shares.

- The rules and regulations regarding stock market should be amended in time to time and the attempts should be made for implementation of the rules & regulation.
- At last, the main element of development of stock market is the peace and political stability, which is the current burning issue of the country.

BIBLIOGRAPHY

Books

Bhalla, V.K. (2004), *Investment Management*, New Delhi: S. Chand and company limited.

Chandra, Prasanna (1995), *Financial Management Theory and Practice*, New Delhi: Tata MCGraw Hill Publishing Company Limited.

Chandra, Prasanna (1995), *The investment Game*, New Delhi: Tata MCGraw Hill publishing Company Limited.

Cheney, J.M. and moses, E.A. (1993), *Fundamental's of Investments*, New York : West Publishing Company

Francis, J.C. (1998), *Investment Analysis and Management*, New York : MCGraw Hill Publication.

Pandey, I.M. (2003), *Financial Management*, New Delhi: Vikas Publishing House.

Pradhan, Radhe Shyam S. (2003), *Basics of Financial Management*, Kathmandu: Educational Enterprises.

Rana, Surya (2000), *Financial Management (Principle and Practice)*, Kathmandu: Ratna Pustak Bhandar.

Sharpe, William F., Alexendar, Gordon J. and Bailey, Jeffery V. (1995), *Investments*, USA: Prentice Hall inc.

Shrestha, Sunity (1995), *Portfolio Behavior of Commercial Bank in Nepal*, Kathmandu: Mandal Book Print.

Shrestha,M.K.(1992), *Shareholders Democracy and Annual General Meeting Feedback and Portfolio Analysis,* Kathmandu: Nepal Publication.

Van Horne, J.C. and Wachowicz Jr., J.M. (1995), *Fundamental of Financial Managements*, USA: Prentice Hall inc.

Wolff, Howard K. and Panta, P.R. (2000), *A Hand Book for Social Science Research and Thesis Writing*, Kathmandu: Buddha Academy.

Weston, J.F. and Copeland, T.E. (1992), *Managerial Finance,* New York: The Dryden Press.

Weston, J.F., Besley, S. and Bringham, E.F. (1996), *Essentials of Managerial Finance,* New York: The Dryden press.

Journal and Annual Reports

Magazine of **New Business Age**

Magazine of **Abhiyan Saptahik**

Magazine of **"Info Himalayan",** May-June, 2003.

Magazine of **Banking Khabar Patra** Vol. No. 60 March-April, 2007.

Magazine **Banking and Financial Statistic,** No. 49 (Mid- July, 2007) Nepal Rastra Bank.

Journal of Finance, Volume 54, No. 4.

Bank of Kathmandu Ltd. **Annual Report** FY 2007/08.

Everest Bank Ltd. **Annual Report** FY 2007/08.

Himalayan Bank Ltd. **Annual Report** FY 2007/08.

Nabil Bank Ltd. **Annual Report** FY 2007/08.

Nepal Rastra Bank **Annual Report** FY 2007/08.

Nepal SBI Bank **Annual Report** FY 2007/08.

Magazine of **Banking Khabar** (2064-01-14)

Thesis

Acharya, Narayan Prasad (2002), "An Analysis of Risk and Return Associated with Common Stock Investment of Joint Venture Banks in Nepal",*An Unpublished Master Degree Thesis,* Central Department of Management TU., Kathamandu.

Bhatta, Gopal P. (1995), "Assessment of the Performance of Listed Companies in Nepal", *M.B.A Thesis,* Central Department of Management, TU., Kathamandu.

Khatiwada, Mohan (1996), "A Study on Securities Investment in Nepal", *An Unpublished Master Degree Thesis,* Central Department of Management T.U., Kathamandu.

Pokharel, Dipak (2008). *Risk and Return on Common Stock Investment of Commercial Bank in Nepal.* Thesis Submitted to Faculty of Management, Shanker Dev Campus, Putalisadak, Kathmandu.

Thapa, Sangita (2007). *Risk and Return in Stock Market Investment in Nepal: Issue and Challenges.* Thesis Submitted to Office of the Dean, Faculty of Management, T.U., Kirtipur.

Websites

www.bok.com.np

www.everestbankltd.com

www.hbl.com.np

www.nepalsbibank.com.np

www.nepalstock.com

www.nrb.org.np

APPENDIX

Calculation of realized return, standard deviation, expected return and C.V. of different industry.

AT-1A: Calculation of RRR, ERR, SD and C.V. of banking industry.

FY	**Banking index**	$R_B \text{ X} \frac{B1_{tZ} BI_{tZ1}}{BI_{tZ1}}$	$R_{BI} \text{ Z} \overline{R}_{BI}$	$\int R_{BI} \text{ Z} \overline{R}_{BI} \text{Å}$
2001/02	379.38	-	-	-
2002/03	219.35	-0.4218	-0.5017	0.2517
2003/04	199.90	-0.0887	-0.1686	0.0284
2004/05	231.97	0.1604	0.0805	0.0065
2005/06	304.64	0.3133	0.2334	0.0545
2006/07	437.49	0.4361	0.3562	0.1269
		$R_{BI} \text{ X} 0.3993$		$\int R_{BI} \text{ Z} \overline{R}_{BI} \text{Å X} 0.4680$

We have,

$$Expected \text{ Re}turn(\overline{R_{BI}}) \text{ X} \frac{R_{BI}}{n} \text{ X} \frac{0.3993}{5}$$

$$\text{X} 0.0799$$

$$S\tan dard \ \ deviation(\pm) \text{ X} \sqrt{\frac{(R_{BI} \text{ Z} \overline{R}_{BI})^2}{n \text{ Z} 1}}$$

$$\text{X} \sqrt{\frac{0.4680}{5 \text{ Z} 1}}$$

$$\text{X} 0.3421$$

$$coefficient \ of \ \text{var}iation(c.v.) \text{ X} \frac{\pm}{\overline{R}_{BI}} \text{ X} \frac{0.3421}{0.0799}$$

$$\text{X} 4.2816$$

AT-1B: Calculation of RRR, ERR, SD and C.V. of finance and insurance.

FY	Banking index	R_{FI} X$\frac{FI_{t}ZFI_{t}Z1}{FI_{t}Z1}$	R_{FI} Z$\overline{R}_{FI}$	$\int R_{FI}$ Z$\overline{R}_{FI}$Å
2001/02	318.67	-	-	-
2002/03	262.29	-0.1769	-0.1505	0.0227
2003/04	208.14	-0.2065	-0.1801	0.0324
2004/05	195.99	-0.0584	-0.0320	0.0010
2005/06	228.39	0.1653	0.1917	0.0367
2006/07	261.37	0.1444	0.1708	0.0292
		R_{FI} XZ0.1321		$\int R_{FI}$ Z$\overline{R}_{FI}$Å X0.122

$$Expected\ \text{Re}turn(\overline{R_{FI}})\ \text{X}\frac{R_{FI}}{n}$$

$$\text{X}\frac{\text{Z}0.1321}{5}$$

$$\text{XZ}0.0264$$

$$S\tan dard\ \ deviation(\pm)\ \text{X}\sqrt{\frac{(R_{FI}\ \text{Z}\overline{R}_{FI})^2}{n\ \text{Z}1}}$$

$$\text{X}\sqrt{\frac{0.122}{5\ \text{Z}1}}$$

$$\text{X}0.1746$$

$$coefficient\ of\ \ \text{var}iation\ \ (c.v.)\ \text{X}\frac{\pm FI}{\overline{R}_{\text{F}I}}$$

$$\text{X}\frac{0.174}{0.0264}$$

$$\text{X}6.6136$$

AT-1C: Calculation of RRR, ERR, SD and C.V. of Hotel.

FY	Hotel index	R_H	$R_H - \bar{R}_H$	$\int R_H - \bar{R}_H$
2001/02	291.34	-	-	-
2002/03	216.51	-0.2568	-0.1708	0.0292
2003/04	196.68	-0.0916	-0.0056	0.00003
2004/05	184.41	-0.0624	0.0216	0.0005
2005/06	178.00	-0.0348	0.0512	0.0026
2006/07	180.77	0.0156	0.1016	0.0103
		R_H X0.4500		$\int R_H - \bar{R}_H$ X0.04263

$$Expected\ \text{Return}(\overline{R_H}) = \frac{R_H}{n}$$

$$= \frac{0.4300}{5}$$

$$= 0.08600$$

$$Standard\ deviation(\pm) = \sqrt{\frac{(R_H - \bar{R}_H)^2}{n-1}}$$

$$= \sqrt{\frac{0.4263}{5-1}}$$

$$= \sqrt{0.107}$$

$$= 0.1032$$

$$coefficient\ of\ \text{variation}(c.v.) = \frac{\pm H}{\bar{R}_H}$$

$$= \frac{0.1032}{0.086}$$

$$= 1.2$$

AT-1D: Calculation of RRR, ERR, SD and C.V. of mfg. industry.

FY	Mfg's index	R_{MI} X$\frac{MI_{tZ}MI_{tZ1}}{MI_{tZ1}}$	R_m Z$\bar{R}_m$	$\int R_M$ Z$\bar{R}_M$ Å
2001/02	349.31	-	-	-
2002/03	273.67	-0.2165	-0.19454	0.0378
2003/04	250.13	-0.0860	-0.0640	0.0041
2004/05	255.58	0.0218	0.04376	0.0019
2005/06	276.50	0.0819	0.10386	0.0108
2006/07	301.11	0.0890	0.11096	0.0123
		R_M XZ0.1098		$\int R_M$ Z$\bar{R}_M$ ÅX0.0669

$$Expected\ \text{Re}turn(\bar{R}_m)\ \text{X}\frac{R_M}{n}$$

$$\text{X}\frac{\text{Z}0.1098}{5}$$

$$\text{XZ}0.02196$$

$$Standard\ deviation(\pm_M)\ \text{X}\sqrt{\frac{(R_M\ \text{Z}\bar{R}_M)^2}{n\ \text{Z}1}}$$

$$\text{X}\sqrt{\frac{0.0669}{5\ \text{Z}1}}$$

$$\text{X}0.1293$$

$$coefficient\ of\ \text{var}iation\ (c.v.)\ \text{X}\frac{\pm M}{\bar{R}_M}$$

$$\text{X}\frac{0.1293}{0.02196}$$

$$\text{X}5.8891$$

AT-1E: Calculation of RRR, ERR, SD and C.V. of trading company.

FY	Trading Index	R_T X$\frac{TI_{tZ}TI_{tZ1}}{TI_{tZ1}}$	R_T Z$\bar{R}_T$	$\int R_T$ Z$\bar{R}_T$ Å
2001/02	115.55	-	-	-
2002/03	102.2	-0.1155	-0.1782	0.0318
2003/04	94.56	-0.0748	-0.1375	0.0189
2004/05	95.01	0.0048	-0.0579	0.0033
2005/06	123.20	0.2967	0.234	0.0548
2006/07	148.11	0.2022	0.1395	0.0195
		R_T X0.3134		$\int R_T$ Z$\bar{R}_T$ ÅX0.1283

We have,

$$Expected\ \text{Re}turn(\bar{R}T)\ \text{X}\frac{R_T}{n}$$

$$\text{X}\frac{0.3134}{5}$$

$$\text{X}0.0627$$

$$S\tan dard\ \ deviation(\pm_T)\ \text{X}\sqrt{\frac{(R_T\ \text{Z}\bar{R}_T)^2}{n\ \text{Z}1}}$$

$$\text{X}\sqrt{\frac{0.1283}{4}}$$

$$\text{X}0.1791$$

$$coefficient\ of\ \text{var}iation(c.v.)\ \text{X}\frac{\pm_T}{\bar{R}_T}$$

$$\text{X}\frac{0.1791}{0.0627}$$

$$\text{X}2.8565$$

AT-1F: Calculation of RRR, ERR, SD and C.V. of others industry.

FY	Others Index	$R_O \text{ X} \frac{OI_{tZ} OI_{tZ1}}{OI_{tZ1}}$	$R_O \text{ Z} \bar{R}_O$	$\int R_O \text{ Z} \bar{R}_O$ Å
2001/02	190.9	-	-	-
2002/03	77.34	-0.5949	-1.1123	1.2372
2003/04	48.56	-0.3721	-0.8895	0.7912
2004/05	142.61	1.9368	1.4194	2.0147
2005/06	347.65	1.4278	0.9204	0.8471
2006/07	410.00	0.1793	-0.3381	0.1143
		$R_O \text{ X} 2.5869$		$\int R_O \text{ Z} \bar{R}_O$ Å X5.0045

We have,

$$Expected \text{ Re}turn(\bar{R}_O) \text{ X} \frac{R_O}{n}$$

$$\text{X} \frac{2.5869}{5}$$

$$\text{X} 0.5174$$

$$S\text{tan}dard \;\; deviation(\pm_T) \text{ X} \sqrt{\frac{(R_O \text{ Z} \bar{R}_O)^2}{n \text{ Z} 1}}$$

$$\text{X} \sqrt{\frac{5.0045}{5 \text{ Z} 1}}$$

$$\text{X} 1.1185$$

$$coefficient \; of \; \text{var}iation(c.v.) \text{ X} \frac{\pm_O}{R_O}$$

$$\text{X} \frac{1.1185}{0.5174}$$

$$\text{X} 2.1618$$

AT-2A: Calculation of beta coefficient of the common stock of NABIL.

FY	Return (R_i)	$(R_i - \overline{R_i})$	Rm	$(R_m - \overline{R_m})$	$(R_i - \overline{R_i})(R_m - \overline{R_m})$
2002/03	0.1286	-0.6491	-0.0997	-0.3783	0.2456
2003/04	0.4392	-0.3385	0.0839	-0.1947	0.0659
2004/05	0.575	-0.2027	0.2911	0.0125	-0.0025
2005/06	0.5449	-0.2328	0.3494	0.0708	-0.0165
2006/07	2.2009	1.4232	0.7681	0.4895	0.6967
					$[(R_i - \overline{R_i})(R_m - \overline{R_m})$ X0.9892

We have,

$$\text{cov}(R_i, \overline{R_m}) \text{ X} \frac{[(R_i - \overline{R_m})(R_m - R_m)]}{n - 1}$$

$$\text{X} \frac{0.9892}{5 - 1}$$

$$\text{X} 0.2473$$

$$i \text{ X} \frac{\text{cov}(R_i, R_m)}{\pm_m^2} \text{ X} \frac{0.2473}{(0.3263)^2}$$

$$\text{X} \frac{0.2473}{0.1065}$$

$$\text{X} 2.32$$

Where,

n=Number of observation =5

$\pm_m^2$ =Variance of market return =0.1065

R_i = Return on stock 'i' (i.e. NABIL)

B_i=Beta of NABIL's common stock.

AT-2B: Calculation of beta of Capital Structure of HBL

FY	$(R_i \; Z\overline{R_i})$	$(R_m \; Z\overline{R_m})$	$[(R_i \; Z\overline{R_i})\,(R_m \; Z\overline{R_m})]$
2002/03	-0.3328	-0.3783	0.1259
2003/04	-0.1552	-0.1947	0.0302
2004/05	-0.0092	0.0125	-0.0001
2005/06	-0.0562	0.0708	-0.0039
2006/07	0.5535	0.4895	0.2709
			$[(R_i \; Z\overline{R_i})(R_m \; Z\overline{R_m})]$ X0.423

We have,

$$co(R_i, R_m) \quad X\frac{[(R_i, \overline{R_m})(R_m \; ZR_m)]}{n \; Z1}$$

$$X\frac{0.423}{5 \; Z1}$$

$$X0.1058$$

$$i \; X\frac{\text{cov}(R_i, R_m)}{\pm \frac{2}{m}} X\frac{0.1058}{(0.3263)^2}$$

$$X\frac{0.1058}{0.1065}$$

$$X0.9934$$

Where,

R_i= Return on stock 'i" (i.e. HBL)

β_i=Beta of HBL's common stock.

AT-2C: Calculation of beta coefficient of Capital Structure of BOK

FY	$(R_i - \overline{R_i})$	$(R_m - \overline{R_m})$	$[(R_i - \overline{R_i})(R_m - \overline{R_m})]$
2002/03	-0.8942	-0.3783	0.3383
2003/04	-0.153	-0.1947	0.0298
2004/05	-0.1849	0.0125	-0.0023
2005/06	1.2845	0.0708	0.0909
2006/07	-0.0522	0.4895	-0.0256
			$[(R_i - \overline{R_i})(R_m - \overline{R_m})] \times 0.4311$

We have,

$$\text{cov}(R_i, \overline{R_m}) \times \frac{[(R_i, \overline{R_m})(R_m - R_m)]}{n - 1}$$

$$\times \frac{0.4311}{4}$$

$$\times 0.1078$$

$$i \times \frac{\text{cov}(R_i, R_m)}{\pm_m^2}$$

$$\times \frac{0.1078}{(0.3263)^2}$$

$$\times \frac{0.1078}{0.1065}$$

$$\times 0.0122$$

Where,

R_i = Return on common stock of BOK

β_i =Beta of coefficient of BOK's CAPITAL STRUCTURE

AT-2D: Calculation of beta coefficient of Capital Structure of SBI Bank

FY	$(R_i - \bar{R_i})$	$(R_m - \bar{R_m})$	$[(R_i - \bar{R_i})(R_m - \bar{R_m})]$
2002/03	-0.8256	-0.3783	0.3123
2003/04	-0.2776	-0.1947	0.0540
2004/05	-0.3903	0.0125	-0.0049
2005/06	0.3603	0.0708	0.0255
2006/07	1.1332	0.4895	0.5547
			$[(R_i - \bar{R_i})(R_m - \bar{R_m})] \times 0.9416$

We have,

$$\text{cov}(R_i, R_m) \times \frac{[(R_i - \bar{R_i})(R_m - \bar{R_m})]}{n - 1}$$

$$\times \frac{0.9416}{5 - 1}$$

$$\times 0.2354$$

and,

$$i \quad \times \frac{\text{cov}(R_i, R_m)}{\pm \frac{2}{m}}$$

$$\times \frac{0.2354}{(0.3263)^2}$$

$$\times \frac{0.2354}{0.1065}$$

$$\times 2.2103$$

Where,

R_i= Return on stock of i (i.e. SBI)

β_i= Beta of common on stock SBI.

AT-2E: Calculation of beta coefficient of Capital Structure of EBL Bank.

FY	$(R_i \ Z\overline{R_i})$	$(R_m \ Z\overline{R_m})$	$[(R_i \ Z\overline{R_i})(R_m \ Z\overline{R_m})]$
2002/03	-0.4802	-0.3783	0.1817
2003/04	-0.0553	-0.1947	0.0108
2004/05	0.567	0.0125	0.0071
2005/06	-0.0145	0.0708	-0.0010
2006/07	0.4935	0.4895	0.2416
			$[(R_i \ Z\overline{R_i})(R_m \ Z\overline{R_m})]$ X0.4402

We have,

$$\text{cov}(R_i, R_m) \text{ X} \frac{[(R_i, \overline{R_m})(R_m \ Z R_m)]}{n \ Z 1}$$

$$\text{X} \frac{0.4402}{4}$$

$$\text{X} 0.11005$$

and,

$$i \quad \text{X} \frac{\text{cov}(R_i, R_m)}{\pm \frac{2}{m}}$$

$$\text{X} \frac{0.11005}{(0.3263)^2}$$

$$\text{X} \frac{0.11005}{0.1065}$$

$$\text{X} 1.0333$$

Where,

R_i= Return on common stock of EBL

β_i=Beta coefficient of common stock of EBL.

AT-3A: Calculation of correlation coefficient between the stock of NABIL and HBL.

FY	$(R_N - \overline{R_N})$	$(R_H - \overline{R_H})$	$[(R_N - \overline{R_N})(R_H - \overline{R_H})]$
2002/03	-0.6491	-0.3328	0.2160
2003/04	-0.3385	-0.1552	0.0525
2004/05	-0.2027	-0.0092	0.0019
2005/06	-0.2328	-0.0562	0.0131
2006/07	1.4232	0.5535	0.7877
			$[(R_N - \overline{R_N})(R_H - \overline{R_H})]$ X1.0712

We have,

$$\text{cov}(R_N, R_H) = \frac{[(R_N - \overline{R}_N)(R_H - \overline{R}_H)]}{n - 1}$$

$$= \frac{1.0712}{5 - 1}$$

$$= 0.2678$$

and,

$$r_{NH} = \frac{\text{cov}(R_N, R_H)}{\pm_N \pm_H}$$

$$= \frac{0.2678}{0.8149 \mid 0.3334}$$

$$= \frac{0.2678}{0.2717}$$

$$= 0.99 \mid 1$$

Where,

R_N = Return on stock of NABIL

σ_N =Standard deviation of return on Capital Structure of NABIL

R_H = Return on common stock of HBL

σ_H= S.D. of return on Capital Structure of HBL

r_{NH}=Correlation between the rate of return on common stock of NABIL and HBL.

AT-3B: Calculation of correlation coefficient between the stock of NABIL and BOK.

FY	$(R_N - \overline{R_N})$	$(R_B - \overline{R_B})$	$[(R_N - \overline{R_N})(R_B - \overline{R_B})]$
2002/03	-0.6491	-0.8942	0.5804
2003/04	-0.3385	-0.153	0.0518
2004/05	-0.2027	-0.1849	0.0375
2005/06	-0.2328	1.2845	-0.02990
2006/07	1.4232	-0.0522	-0.0743
			$[(R_N - \overline{R_N})(R_B - \overline{R_B})] \times 0.2964$

We have,

$$\text{cov}(R_N, R_B) = \frac{[(R_N - \overline{R_N})(R_B - \overline{R_B})]}{n - 1}$$

$$= \frac{0.2964}{5 - 1}$$

$$= 0.0741$$

and,

$$r_{NB} = \frac{\text{cov}(R_N, R_B)}{\sigma_N \sigma_B}$$

$$= \frac{0.0741}{0.8149 \times 0.7921}$$

$$= \frac{0.0741}{0.6455}$$

$$= 0.1148$$

Where,

R_N = Return on stock of NABIL

σ_N =Standard deviation of return on Capital Structure of NABIL

R_B = Return on common stock of BOK

r_{NB}=Correlation coefficient between the return on common stock of NABIL and BOK.

AT-3C: Calculation of correlation coefficient between the stock of NABIL and SBI.

FY	$(R_N \; Z\overline{R_N})$	$(R_S \; Z\overline{R_S})$	$[(R_N \; Z\overline{R_N})(R_S \; Z\overline{R_S})]$
2002/03	-0.6491	-0.8256	0.5359
2003/04	-0.3385	-0.2776	0.0939
2004/05	-0.2027	-0.3903	0.0791
2005/06	-0.2328	0.3603	-0.0839
2006/07	1.4232	1.1332	1.6128
			$[(R_N \; Z\overline{R_N})(R_S \; Z\overline{R_S})]$ X2.2378

We have,

$$\text{cov}(R_N, R_S) \text{ X} \frac{[(R_N \; Z\overline{R}_N)(\overline{R}_S \; Z\overline{R}_S)]}{n \, Z1}$$

$$\text{X}\frac{2.2378}{4}$$

$$\text{X}0.5595$$

and,

$$R_{NS} \quad \text{X}\frac{\text{cov}(R_N, R_S)}{\pm_N \cdot \pm_S}$$

$$\text{X}\frac{0.5595}{0.8149 \mid 0.7624}$$

$$\text{X}0.9005$$

Where,

R_N = Return on stock of NABIL

R_S = Return on common stock of SBI

σ_S= Standard deviation on Capital Structure of SBI

r_{NS}=Correlation between the rate of return on common stock of NABIL and SBI bank

AT-3D: Calculation of correlation coefficient between the return on Capital Structure of NABIL and EBL.

FY	$(R_N \; Z\overline{R_N})$	$(R_E \; Z\overline{R_E})$	$[(R_N \; Z\overline{R_N})(R_E \; Z\overline{R_E})]$
2002/03	-0.6491	-0.4802	0.3117
2003/04	-0.3385	-0.0553	0.0187
2004/05	-0.2027	0.0567	-0.0115
2005/06	-0.2328	-0.0145	0.0034
2006/07	1.4232	0.4935	0. 7023
			$[(R_N \; Z\overline{R_N})(R_E \; Z\overline{R_E})]$ X1.0246

We have,

$$\text{cov}(R_N, \overline{R_E}) \text{ X} \frac{1.0246}{4} \text{X} 0.2562$$

and,

$$r_{NE} \quad \text{X} \frac{\text{cov}(R_N, R_E)}{\pm_N \pm_E}$$

$$\text{X} \frac{0.2562}{0.8149 \mid 0.3467}$$

$$\text{X} 0.9069$$

Where,

R_E = Return on EBL's common stock

r_{NE}=Correlation between the rate of return of NABIL and EBL

AT -4A: Calculation of cut- off rates

$$C_i = \frac{\pm^2_m \sum_{i=1}^{i} \frac{(\overline{R_i} - ZT)B^2_i}{\pm^2_{ei}}}{1 + \pm^2_m \sum_{i=1}^{i} \frac{B^2_i}{\pm^2_{ei}}}$$

Where,

C_i = Cut – off rates of stock i

$\pm^2_m$ = Market variance.

$\pm^2_{ei}$ = Unsystematic risk.

The value of C_i for the stock are as follows respectively.

$$C_{BOK} = \frac{1064 - 0.0124}{1 + 1064 - 0.0002}$$

$$= 10.8786$$

$$C_{EBL} = \frac{1064 - 0.9299}{1 + 1064 - 0.0169}$$

$$= 52.1249$$

$$C_{HBL} = \frac{1064 - 1.5968}{1 + 1064 - 0.0377}$$

$$= 41.3252$$

$$C_{NABIL} = \frac{1064 - 1.7802}{1 + 1064 - 0.0436}$$

$$= 39.9687$$

$$C_{SBI} = \frac{1064 - 1.9331}{1 + 1064 - 0.0516}$$

$$= 36.7930$$

AT-5A: Calculation of systematic and unsystematic Risk of each stocks

Stock	Total Risk σ_i^2	Beta (β_i)	Market Variance σ_m^2	Systematic $\sigma_i^2 \beta_m^2$	Unsystematic Risk σ_{ei}^2 (TR − SR)
NABIL	0.6641	2.31	0.1065	$(2.31)^2 \times 0.1065 = 0.5683$	(0.6641-0.5683)=0.0958
HBL	0.1113	1	0.1065	$(1)^2 \times 0.1065 = 0.1065$	(0.1113-0.1065)=0.0048
BOK	0.6275	1.0122	0.1065	$(1.0122)^2 \times 0.1065 = 0.1091$	(0.6275-0.1091)=0.5184
SBI	0.5812	2.2103	0.1065	$(2.2103)^2 \times 0.1065 = 0.5203$	(0.5812-0.5203)=0.0609
EBL	0.1201	1.0333	0.1065	$(1.0333)^2 \times 0.1065 = 0.1137$	(0.1201-0.1137)=0.0064

AT-5B: Calculation of proportion of systematic risk and unsystematic risk

Stock	Proportion of SR = $\frac{SR}{TR}$	Proportion of USR =1 Proportion of SR
NABIL	$\frac{0.5686}{0.6641} \times 0.8557$	1 - 0.8557 = 0.1443
HBL	$\frac{0.1065}{0.1113} \times 0.9568$	1 - 0.9568 = 0.0432
BOK	$\frac{0.1091}{0.6275} \times 0.1738$	1 - 0.1738 = 0.8262
SBI	$\frac{0.5203}{0.5812} \times 0.8952$	1 - 0.8952 = 0.1048
EBL	$\frac{0.1137}{0.1201} \times 0.9467$	1- 0.9467 = 0.0533

AT: 6A Calculation of Expected returns and risk for different portfolios under minimum variance port folio

For portfolio A

$E(R_N)$= Expected return of NABIL's=0.7778

$E(R_H)$ = Expected return of HBL's = 0.3801

$\pm_N^2$ = Variance of NABIL = 0.6642

$\pm_H^2$ = Variance of HBL= 0.11125

COV (N, H) = Co-variance of NABIL and HBL=0.2678

We know,

$E(R_P)$ i.e. $E(R_A)$ = $E(R_N)\times W_N + E(R_H)\times W_H$

$= 0.7778\times(-0.65)+0.3801\times(1.65)$

$= 0.1216$

$= 12.16\%$

$\pm_p$ *i.e.* $\pm_A$ $X\sqrt{W_N{}^2\pm_N^2 \Gamma w_H^2 \pm_H^2 \Gamma 2W_N W_H \mid Cov(N_i H)}$

$X\sqrt{(Z0.65)^2 \mid (0.6642)\Gamma(1.65)^2 \mid (0.1125)\Gamma 2 \mid (Z0.65) \mid (1.65) \mid (0.2678)}$

$X\sqrt{0.0091}$

$X0.0952$ *or* 9.52%

Working note:

Optional weight

$$w_N \; X\frac{\pm_H^2 Z\mathrm{cov}_{(N,H)}}{\pm_N^2 \Gamma \pm_H^2 Z2\,\mathrm{cov}_{(N,H)}}$$

$$X\frac{0.11125 Z0.2678}{0.6642\Gamma 0.11125 Z2 \mid 0.2678}$$

$$X\frac{Z0.15655}{0.23985}$$

$$XZ0.65$$

w_H $X1ZZw_N$

$X1Z(Z0.65)$

$X1\Gamma 0.65$

$X1.65$

For portfolio B

E (R_N) = Expected return of NABIL=0.7778

E (R_B) = Expected return of BOK = 0.6934

$\pm_N^2$ = Variance of NABIL = 0.6642

$\pm_B^2$ = Variance of BOK= 0.6275

Cov. (N,B)= Covariance of NABIL and BOK=0.0741

$$E(R_P) \; i.e. E(R_B) = E(R_N) \times W_N + E(R_B) \times W_B$$
$$= 0.7778 \times 0.48 + 0.6934 \times 0.52$$
$$= 0.7339 \; or \; 73.39\%$$

$$\pm_P \; i.e. \pm_B = \sqrt{\pm_N^2 \times w_N^2 + \pm_B^2 \times w_B^2 + 2 w_N w_B \; \text{cov}_{(N,B)}}$$
$$= \sqrt{0.6642 \times (0.48)^2 + 0.6275 \times (0.52)^2 + 2 \times 0.48 \times 0.52 \times 0.0741}$$
$$= \sqrt{0.3597}$$
$$= 0.5997 \; i.e. \; 59.97\%$$

w/ Note

$$w_B = \frac{\pm_N^2 \times \text{cov}_{(N,B)}}{\pm_N^2 + \pm_B^2 \times 2 \text{cov}_{(N,B)}}$$
$$= \frac{0.6642 \times 0.0741}{0.6642 + 0.6275 \times 2 \times 0.0741}$$
$$= \frac{0.5901}{1.1435}$$
$$= 0.52$$
$$w_N = 1 - w_B$$
$$= 1 - 0.52 = 0.48$$

For portfolio 'C'

E(R_N) = Expected return of NABIL=0.7778

E(R_S) = Expected return of HBL's = 0.4815

$\pm_N^2$ = Variance of NABIL = 0.6642

$\pm_S^2$ = Variance of SBI= 0.5812

Cov (N,S) = Covariance of NABIL and SBI=0.5595

$$E(R_P) \; i.e. E(R_C) \; X E(R_N) \mid W_N \; \Gamma E(R_S) \mid W_S$$

$$X 0.7778 \mid 0.17 \; \Gamma 0.4815 \mid 0.83$$

$$X 0.5319 \; i.e. \; 53.19\%$$

$$\pm_P \; i.e. \pm_C \; X \sqrt{\pm_N^2 \mid w_N^2 \; \Gamma \pm_s^2 \mid w_S^2 \; \Gamma 2 W_N w_S \; \text{cov}_{(N,S)}}$$

$$X \sqrt{(0.17)^2 \mid 0.6642 \; \Gamma (0.83)^2 \mid 0.5812 \; \Gamma 2 \mid 0.17 \mid 0.83 \mid 0.5595}$$

$$X \sqrt{0.5775}$$

$$X 0.7599$$

W/Notes

Optimal weight

$$w_S \; X \frac{\pm_N^2 \; Z \text{cov}_{(N,S)}}{\pm_S^2 \; \Gamma \pm_S^2 \; Z 2 \text{cov}_{(N,S)}}$$

$$X \frac{0.6642 \; Z 0.5595}{0.5812 \; \Gamma 0.6642 \; Z 2 \mid 0.5595}$$

$$X \frac{0.1047}{0.1264}$$

$$X 0.83 \; i.e. 83\%$$

$$w_N \; X 1 \; Z \; w_S$$

$$X 1 \; Z 0.83$$

$$X 0.17$$

For portfolio D

$E(R_N)$ = Expected return of NABIL=0.7778

$E(R_E)$ = Expected return of EBL = 0.6283

$\pm_N^2$ = Variance of NABIL = 0.6642

$\pm_E^2$ = Variance of EBL= 0.1201

cov(N,E)= Covariance of NABIL and EBL=0.2562

$$E(R_P) \; i.e. E(R_D) \; X E(R_N) \mid W_N \; \Gamma E(R_E) \mid W_E$$

$$X 0.7778 \mid (Z 0.50) \; \Gamma 0.6283 \mid (1.50)$$

$$X 0.5536 \; i.e. \; 55.36\%$$

$$\pm_P \; i.e. \pm_D \; X \sqrt{\pm_N^2 \mid w_N^2 \; \Gamma \pm_E^2 \mid w_E^2 \; \Gamma 2 W_N w_E} \; \text{cov}_{(N,E)}$$

$$X \sqrt{(Z 0.50)^2 \mid 0.6642 \; \Gamma (1.50)^2 \mid 0.1201 \; \Gamma 2 \mid (Z 0.50) \mid (1.50) \mid 0.2562}$$

$$X \sqrt{0.05198}$$

$$X 0.2279$$

W/Note

$$w_E = \frac{\sigma_N^2 - \mathrm{cov}_{(N,E)}}{\sigma_N^2 + \sigma_E^2 - 2\,\mathrm{cov}_{(N,E)}}$$

$$= \frac{0.6642 - 0.2562}{0.6642 + 0.1201 - 2 \times 0.2562}$$

$$= \frac{0.408}{0.2719}$$

$$= 1.50$$

$$w_N = 1 - w_E$$

$$= 1 - 1.50$$

$$= -0.50$$

We have

$$\text{Expected Return } (\bar{R}) \text{ X} \frac{R}{n}$$

$$= \frac{3.886}{5} \text{X} 0.7777$$

$$\text{Standard deviation } (\pm) = \sqrt{\frac{\phi(R \text{ Z} \bar{R})^2}{n \text{ Z} 1}}$$

$$= \sqrt{\frac{2.6567}{5 \text{ Z} 1}} \text{ X} 0.8149$$

$$\text{Co-efficient of variation (C.V.)} = \frac{\pm}{\bar{R}}$$

$$= \frac{0.8149}{0.7777}$$

$$= 1.0478$$

We, have,

$$\text{Expected Return } (\bar{R}) \text{ X } \frac{\phi R}{n}$$

$$\text{X} \frac{1.9006}{5}$$

$$= 0.3801$$

i.e. 38.01%

$$\text{Variance } (\pm)^2 \text{ X} \frac{\phi(R \text{ Z} \bar{R})^2}{n \text{ Z} 1}$$

$$\text{X} \frac{0.4446}{5 \text{ -} 1}$$

$$= 0.11125$$

$$\text{Standard Deviation } (\pm) \text{ X} \sqrt{\frac{\phi(R \text{ Z} \bar{R})^2}{n \text{ Z} 1}}$$

$$\sqrt{\frac{0.4446}{5 \text{ Z} 1}}$$

$$= 0.3334 \text{ or, } 33.34\%$$

$$\text{Coefficient of Variation (C.V.)} = \frac{\pm}{\bar{R}}$$

$$= \frac{0.3334}{0.3801}$$

$$= 0.8771$$

We have,

Expected Return $(\overline{R})$ $= \frac{\phi R}{n}$

$\frac{\text{X } 3.4672}{5}$

$= 0.6934$

$= 69.34\%$

Variance $(\pm)^2$ $= \frac{\phi(R \text{ Z } \overline{R})^2}{n \text{ Z} 1}$

$\text{X}\frac{2.5098}{5 \text{ Z} 1}$

$= 0.6275$

Standard Deviation $(\pm)$ $= \sqrt{\frac{\phi(R \text{ Z } \overline{R})^2}{n \text{ Z} 1}}$

i.e. $\sqrt{\pm^2}$

$= \sqrt{0.6275}$

$= 0.7921$

Coefficient of variation (C.V.) $= \frac{\pm}{R}$

$\text{X}\frac{0.7921}{0.6934}$

$= 1.1424$

We have,

Expected Return $(\bar{R})$ $X\frac{\phi R}{n}$

$X\frac{2.4075}{5}$

= 0.4815 or 48.15%

Variance $(\pm^2)$ = $\frac{\phi(R Z \bar{R})^2}{n Z 1}$

$X\frac{2.3249}{5 Z 1}$

= 0.5812

Standard deviation $(\pm)$ X $\sqrt{\pm^2}$

= $\sqrt{0.5812}$

= 0.7624

Coefficient of Variation (C.V.) = $\frac{\pm}{\bar{R}}$

$X\frac{0.7624}{0.4815}$ X 1.5833

We have,

$$\text{Expected Return } (\bar{R}) \text{ X} \frac{\phi R}{n}$$

$$\text{X} \frac{3.1417}{5}$$

$$\text{X} 0.6283 \textit{ or } 62.83\%$$

$$\text{Variance } (\pm^2) \text{ X} \frac{\phi (R \text{ Z} \bar{R})^2}{n \text{ Z} 1}$$

$$= \frac{0.4805}{5 \text{ Z} 1}$$

$$\text{X} 0.1201$$

$$\text{Standard deviation } (\pm) \text{ X} \sqrt{\pm^2}$$

$$= \sqrt{0.1201}$$

$$= 0.3467$$

$$\text{Coefficient of variation } (C.V.) = \frac{\pm}{\bar{R}}$$

$$\text{X} \frac{0.3467}{0.6283}$$

$$= 0.5518$$

E.R. - Expected return

S. D. - Standard devotion

C.V. - Coefficient of variation

We have,

Expected market return, E (R_m) or $\bar{R}_m = \frac{\phi R_m}{n}$

$= \frac{1.3928}{5}$

$= 0.2786$

Standard deviation (σ_m) $= \sqrt{\frac{\phi (Rm - \bar{R}\, m)^2}{n\, Z1}}$

$= \sqrt{\frac{0.4258}{5\, Z1}}$

$= 0.3263$

Coefficient Variation (C.V.) $= \frac{\pm_m}{\bar{R}_m}$

$= \frac{0.3263}{0.2786}$

$= 1.1712$

$Z_{BOK}\ X \frac{1.01122}{5184} (62.5765\, Z 52.1249)$

$= 0.0002 \times 10.4516$

$= 0.0021$

$Z_{EBL} = \frac{1.03333}{64} (54.9985\, Z 52.1249)$

$= 0.0161 \mid 2.8736$

= 0.0463

$$\sum_{i=1}^{2} Z_i \text{ X } Z_{BOK} + Z_{EBL}$$

= 0.0021 + 0.0463

= 0.0484

$$Xi \text{ X} \frac{Z_i}{\sum_{i=1} z_i}$$

$$X_{BOK} \text{ X} \frac{0.0021}{0.0484}$$

= 0.0434 i.e. 4.34%

$$X_{EBL} \text{ X} \frac{0.0463}{0.048}$$

= 0.9566 i.e. 95.66%