# CHAPTER – ONE

## 1. INTRODUCTION

### 1.1 Background of the field work

Our country Nepal is one of the least developed countries in the world. As compared with neighboring countries, Nepal has a very small economy. The main reason or the source of such condition is not only just our poverty but also illiteracy, unemployment and also habit of the following others trends and policies. These problems can be reduced through mobilizing all kinds of available resources. Nepal has adopted mixed economy to develop nation through participation of both private as well as public sector.

Development of any country is directly related with its economic development. The economic development of the country in turn depends upon the capital formation and industrialization. Industrialization can be achieved through proper use of the funds and their investment in the productive sector. Scattered funds around the country can be collected through the financial institution. “Investment can be made through the stock market or capital market. Stock market is such financial market which facilitates the buying and selling of stock conveniently to all those who are interested in carrying out such transaction. It is assured that out such transaction. It is assumed that development of stock market enhances the development of country’s financial sector one it finally help in growth of the nation. Hence it is very essential to have very sound and action stock as well as it help generally public by providing the necessary information and services under one root. Thus, making it easy for them,” Securities market exists in order to securities meaning buyer and seller of securities meaning they are mechanism to create and facilitates the exchange of financial assets” (Pandey1999:570).

In context o f our country, there are many people who are illiterate. Only few know the significance of bank and banking activities. The modern complex economic system cannot function without bank. The banking system has facilitated the transaction of all types. It has made easier to develop the agriculture, industry and trade. At the same time it has helped to accelerate the pace of economic development of country and upliftment of socio-economic condition because of the fact of bank present it says that it is a financial institution which helps, in economic and commercial development of the nation.

Among various sector Risk and Return is most important. It is generally reflected as a pillar of any business enterprises. Return is the motivating force in the investment process, that is, it is the reward undertaking the investment. Therefore it has crucial importance to investors. It is the only rational way for corporation to compare alternative investments that differ in what they offer.

Return is the main attraction for the investor to invest in risky securities as stock accepting a varying degree of risk tolerance. Hence investor wants favorable return to be yield by stock, and go for those, which yield more.

“The Return on investment is dividend plus changes in market price of the share (MPS). It is expressed in percentage. Both of these items are uncertain. So the actual return on investment in common stock may differ substantially from the expected return.” (Sonia, 2001:32)

Risk and Return go together in investments. It is not sensible to talk about returns without talking about risk because investment decisions involve a risk return trade off.

Risk is the chance that the actual outcome from an investment will differ from expected outcome. It is the bitter truth of lie, which is a product of future uncertainty

and its magnitude depends upon the degree of variability in uncertain cash flow. Risk infact is an indication of change of investment back. Interpretation of risk varies as per people's attitude towards it, in real. Risk is any unknown unfavorable event. It is a chance of losing some value.

"Risk defines the variability of possible outcomes from that which was expected" (Van and James, 1999:72)

"Risk refers to the set of unique outcomes for a given which can be assigned probabilities" (Khan and Jain, 1992:89).

"Every investment entails some degree of risk, it requires a present certain sacrifice for a future uncertain benefit" (Clark, 2000:1)

The concept of Risk and Return are the determinant for the valuation of securities. However, risk means that we do not know what is going to happen even though we occasionally have a good idea of the range of possibilities that we face. In the most basic sense risk can be defined as the chance of loss. Assets having greater chances of loss are viewed as ma\ore risky then those with lesser chances of loss. More formally, the term risk is used interchangeable with uncertainty to refer to the variability of return associated with a given assets.

There is the relationship between expected return and expected level of associated risk. The nature of the relationship is that as the level of expected risk increases, the level of expected return also increases. The opposite is true as well. This risk-return relationship is characterized as being a direct relationship or a positive relationship. This risk-return relationship is characterized as being a direct relationship or a positive.

The concept banking system was introduced in Nepal with the establishment of Nepal Bank ltd in1937. The financial monopoly has changed with the introduction of joint venture banks in 1984. The domestic banks of Nepal, Nepal Bank Ltd and Rastriya Banijya Bank could no longer able to enjoy monopoly. The number of commercial bank has seen increasing so in various sectors. Contribution of commercial banks has been increasing in the overall economic development of the country.

## 1.2 Focus of the study

The main focus of this study is the risk and return analysis of the common stock of investment of the listed commercial banks of Nepal. The relationship between risk and return is a topic of major concerned among investor and analyst. The relationship is very critical and very difficult to understand common stock is comparatively risky assets than other security in the capital market. The main purpose of the study is to analyze how one can get sustainable profit by minimizing the risk. For this purpose, expected return, total risk, systematic risk and unsystematic risk are analyzed to give an idea to get sustainable profit by diversifying the risk to avoid future loss of the common stock investment.

The analysis of the risk and return is significant in investment decision as well as managerial decision. It influences risk and return of the shareholders. Consequently the risk and return, analysis influences the market price of the stock. So before making as investment decision a person must analyze the risk and return from particular stock as well as they can make a good risk- minimizing portfolio between their investments in the stock. The investor suffers more for not recognizing the trades off between risk and return. Return and risk are the two most important criteria for investment decision. Return is the income from an investment.

In the context of Nepal, the capital market is growing very slowly. The market is not efficient, there are very few magazines or articles related to capital market and very few students are made on the topic risk and return. Because of these all thing most of the investor is investing all thing most of the investor are investing on the capital market without any proper knowledge and information.

The study will give information about Nepalese capital market by analyzing risk and return and will definitely contribute to increase the analytical power of he investor in capital market. The studying is not only to fulfill but also to provide some knowledge about the Nepalese stock market development. Other theories and tools are also used to support the risk and return theory. It is suggested to the policy maker to make necessary policies to attract private sector investment in the productive sector and reforms in policies ration to stock trade is quite necessary for development of security market in Nepal. It is believed that this study will help many investors to know how they should use their money which investing in financial securities. Apart from all these this study may be matter of interest for academicians, students, teachers etc.

### 1.3 Statement of Problem

It is true that after the establishment of Nepal stock exchange, the capital market has grown rapidly within a very short period. However the attitude, thoughts and knowledge of the most investors is not changed. Most of the investors are least familiar with the financial activities. They don't have idea of risk and return. Without having theoretical knowledge of risk associated with, investment, most of the investors is making investment on stock, which is very wrong and bad trend.

Theory says that the stock price in market is guided by the intrinsic value, which is calculated by and of company's result of financial performance such as dividend, required rate of return and growth rate. In a efficient market condition stock price is equal to the intrinsic value. Since buyer and figures of the company Therefore, one can say that market price and financial performance are positively correlated but

condition here are totally different from whatever the theory has depicted in or applicable in our context. Where most of the investor's doesn't know the information and so they cannot make a rational decision regarding transaction of the stock. Therefore, stock price in Nepal is determined most by other factor than the financial performance of the concerned company.

At the same time there are no any separate institution, which provides information required to make rational decision that can accelerate stock investment and market efficiency. Government policy is found less encouraging in promoting common stock investment. Therefore, courage is needed and at the same time faith to invest in common stock because there are several questions which may have arising in the mind of the individual investors at the time of investment. Some of the common questions that frequently occurs/arise in an investors mind can be listed below.

- How do they know about the magnitude of risk?
- What should be the compensation for bearing risk?
- How can we make higher return through risk?
- What are the criteria for evaluation that the stock they are holding will give them favorable return?
- How can investor diversify the risk?

So, these are the burning issues that have influenced researcher to carry on the studies.

## 1.4 OBJECTIVES OF THE STUDIES

The basic objective of the study is to focus on the risk, return and common stock investment of Nepalese joint venture banks. The study will also try to pin or point the real problems occurring in common stock in joint venture banks. The stated problems are analyzed regarding to banks sectors. The specific levels of objectives of the study are:-

- To evaluate the common stock of listed joint venture banks in terms of risk and return.

- To measure systematic and unsystematic risk of the commercial banks.
- To find overprice, under price and correctly priced of common stocks of joint ventures banks.
- To identify the co-variance and correlation between the return of common stocks of joint venture banks.
- To provide applicable suggestion on the basic of finding to mgmt and govt.

## 1.5 SIGNIFICANCE OF THE STUDY.

Thus research study will provide actual information about contribute in the analytical power of the investor. In Nepalese context, very few studies are and there are no specific magazines and articles on the topic. So, the study will be more significant for exposing and increasing stock investment. The main significance of the study is:-

- This study will be a matter of interest for academic students and investors.
- The study might have the clean concept over their investor, they will be able to distinct the investment among all investment opportunities.
- Their studying will be beneficial for the entire person who is directly or indirectly related to the Nepalese Stock Market.
- This study may provide significant information to Nepalese Stock Market development along with providing ideas to minimize the risk on stock investment.

## 1.6 LIMITATIONS OF THE STUDY

There are many limitation related with study. The study is fully dependent on the data provided by different sources. The main limitations are time taken, reliability of data and other factors which cannot included during the study. Because of limited time secondary data, simple techniques are used to analyze the data. Thus, the limitations of the study are as follow:

- This study is based on few commercial banks. These banks may not be the representative of the total banking sectors.
- The study is not based on primary data. It is based on secondary data. Consequently, the result depends on the reliability of secondary data.
- The study covers only 6years period data from the FY1999/00to FY 2004/05.
- The study is basically concerned with the risk and return analysis of commercial banks and market (NEPSE). It does not consider other financial analysis of the banks.
- Time and money are also the limitation of this study.
- Lack of knowledge and information about the financial term. It is difficult to collect the data from the related party.

### 1.7 Organization of the study

The whole study has been organized into five chapters and they are pointed out below.

**Chapter 1:** This chapter deals with introduction along with background of the study, statement of problem, objective of the study, significance of the study and limitation of the study.

**Chapter 2:** This chapter deals with the review of literature. It also includes discussion on the conceptual framework and review of the major studies in general.

**Chapter 3:** This chapter deals with research methodology which includes research design, population and samples, sources of data, data gathering procedures and methodology of analysis and definition of statistical tools.

**Chapter 4**: This chapter deals with the presentation and analysis of data through the way which has been mention in the methodology. Tables and diagrams are also used to accomplish the research objectives.

**Chapter 5**: This chapter deals with the summary, conclusion and recommendation for the study. At the end of this study bibliography and appendices are also attached.

# CHAPTER –TWO

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## REVIEW OF THE LITERATURE

Review of the literature provides basic foundations to this study. The various approaches employed in the studies are, in fact, derived from the different survey. The purpose of this literature review is to get acquainted with what has been accomplished in the concerned subject matter and what is yet to be accomplished. It also gives the knowledge about the study being undertaken.

Review of the literature refers to the reviewing past studies in the concern subject matters that may be books, articles, journals, thesis/dissertations or any types of publications concerning the banks and the related topic. Review of literature helps to get enough information about the subject matter that is going to be researched. This chapter clears the history of risk and return and its development.

Risk and return analysis of the stock in the present days has been the focal point in the capital market area in relation with portfolio management. In the investment process, risk and return aspects and the formation of an optimal portfolio are the major two tasks. The basic essential of the modern portfolio theory are to avoid risks and to calculate the risk premium that investors needs for involving in the risky investment. The objective of this section is to know how various writers have described about risk and return.

### 2.1 Conceptual Framework

Various books which deal with theoretical aspects of risk and return are taken into consideration. Major focus is given on the investment of common stock and its impact on individual risk and return.

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**Common stock**

The study is focused on common stock investment. "Common stock represents equity or ownership position in a corporation. It is a residual claim, in the sense that creditors and preferred stock holders must be paid as scheduled before common stock holders can receive any payment." (Sharpe, Alexander, Bailey, 1999:450). When investor buys common stock, they receive certificate of ownership as a proof of their being part of ownership of the company. The certificate states the number of share purchased and their value. Securities market exits in order to bring together buyers and sellers of securities to facilitate the exchange of financial assets of stock market. Which probably has the greatest glamour and is perhaps the least understood. Some observers consider it has a legalized heaven for gambling and very investors consider stock market as an interesting game. Load Keynes is the first person to express stock market as "a game of professional's investment". The main purpose is to win or to make lots of money. Success comes to one who treats it as a game to be played not only for profit but also for enjoyment and sports. Stock market provides both opportunity and threats. It is useful for the will-inurned peoples who have better knowledge of market realities and it becomes a danger for the unknown people.

Securities Boards, Nepal, (SEBON) was established on 26 May under the provision of the securities Exchange Act 1983. It was established with the objectives of promoting and protecting the interest of investors by regulating the securities market besides the regulatory role. It is also responsible for the development of securities market in the country.

Among all the forms of securities, common stock appears to be the most romantic. While fixed income investment revenue may be more important to most of the investors, common stock seems to capture their interest the most .The potential reward and penalties associated with common stocks make them an interesting and exciting proposition and common investment is a favorite topic for conversation in

parties and get together. (Securities board Nepal, Annual report, 1999/2000, May 2001:5)

Common stock holders of a corporation are its residual owner. Their claim to income and assets comes after creditors and preferred stocks holders have been paid fully. As a result stockholder return on investment is less certain than the return to lender or to preferred stock holder. The share of the common stock can be authorized either with or without par value. The par value of the stock is merely a stated figure in the corporate charter and is of little economic significance.

Common stock are generally regarded as " fully paid and non assessable ", which means that common stock holders may not lose their initial investment. That is, if the corporation fails to meet its obligation, the stockholder cannot be forced to give the corporation the funds that are needed to payoff the obligation. However as a result of such a failure, it is possible that the value of a corporation shares will be negligible. This will result in the shareholder having listed on amount equal to the price previously paid to buy the shares.

**Common stock fundamentals**

The true owners of business firms are the common stock holders to invest their money in the firm because of their expectation of future returns. A common stock holder is sometimes referred as a residual owner, since in essence he /she receive what is left after all other claim on the firm's income and assets has been satisfied. Here are the fundamental aspects of common stock.

**Control: -**

Common stockholder have voting rights that can be used to elect corporate director who in turn, appoints the corporate officers. Generally, stockholder also has the right to vote on:

- Any issue that will have an effect on the corporation.
- Any proposal that will change their individual percentage ownership.
- Any significant contract or financial arrangement.

**Pre - Emptive right**

A pre - emptive right gives existing stockholder the first option to purchase in a new issue of a corporation stock. The purpose of this provision is to protect stockholder against a loss of voting control and a dilution in their share.

**Liquidation Right**

Common stockholder receives no priority as owners rather than creditors in the distribution of assets resulting from a liquidation of the corporation typically after assets are sold and liabilities as well as preferred stockholder are satisfied.

**Dividends**

The payment of corporate dividend is at the discretion of the board of director. Most corporation pay dividend quarterly. Dividend may be paid as cash, stock or merchandise. Cash dividend is the most common whereas merchandise dividends are the least common. Before dividend are paid to the common stockholder the claim of all creditors, the government and preferred stockholder must be satisfied.

**Common Stock Values**

Terms that are frequently used to refer to common stock values include par value, book value and the market values.

**Par value**

The face value of the stock which is established at the time when the stock is initially issued is called par value. Without a stock split or others action performed by the board of director, the par value of the stock does not change.

**Market value**

Market value is the secondary market which is determined by supply and demand factors and reflects consumers of investors and traders concerning the value of the stock.

**Distribution of Earning and Assets**

Common stock lenders have no guarantee of receiving any periodic distribution of earning in the form of dividend or they are not guaranteed any thing in the event of liquidation. However one thing they are assured of is that they cannot lose any more than they have invested in the firm.

**Voting Right**

Generally each share of common stock entitles the folder to one vote in the election of directors and in order special election votes are generally assignable and must be cost of the annual stockholders meeting

**Meaning of Returns**

The concept of return has different meaning to different investors. Investor might purchase the stock of those firms that pays large cash dividends. Other investors are concerned primarily with growth. They would see project that offer the promise of long term, higher than average growth of sales earning and capital appreciation. With most investment an individual or a business organization spends money today with an expectation of earning even more money in the future. Thus, the concept of return provides investor with a convenient way of expressing the financial performance of an investment.

“The return is the total gain or loss experience on as investment over a given period of time. It is commonly measured as the change in value thus any cash distribution

during the period, expressed as a percentage of the beginning of period investment value." (Lawrence J Gittmen, 2001:238)

**Return on common stock**

"The return from an investment is the realization cash flow earned by its owner during a given period of time. Typically it is expressed as percentage of beginning of period value of the investment. "(Chandra, 1995:62)

Return on common stock is consists of the dividend yield and capital gain. An example derived from the book of Bready and Mayers (1998:68) is taken into consideration to make it clearer. According to them "if current price of share is p0 and expected price expected at the end of the year is P, and the expected dividend per share is Div1. The rate of return that investor expect from share over the next year is defined as the expected price appreciation per share $P_1$-$P_0$, all dividend by the beginning price $P_0$.

$$R \text{ X} \frac{D_1 \Gamma P_1 \text{ Z} P_0}{P_O}$$

**Expected Rate of Return.**

Most of the investment decisions are made for future event. Hence it is necessary to predict the future return than the past return. But future is always uncertain for the common stockholders. There fore it leads to find expected rate of return of a security is the sum of the product of possible rate of return and their probabilities.

$$E(R) = \sum_{j=1}^{n} r_j p_j = r_1 p_1 + r_2 p_2 + \ldots\ldots\ldots\ldots + r_n p_n$$

Where,

$r_j$= Rate of return on $j^{th}$ outcome or event.

$P_j$ = Probability of occurrence of jth outcome or event.

n = no of probabilities

Expected rate of return based on the historian data can be calculated as follows: -

Expected rate of return ( $\bar{R}$ ) $X\frac{r_j}{n}$

Where,

$\sum r_j$ = sum of the return of stock j

n = no. of years that the return are taken

The holding period returns refers to the returns from holding an investment over some period as cash payment received due to ownership and the change in the market price derived by the beginning price. If investors purchase a stock of any company and holds it for certain period he can get return in two ways- one is increased in the volume of that stock as compared to initial one and another is direct cash payment.

For common stock we can define one period return as

$$R\ X\frac{D_t\ \Gamma(p_t\ ZP_{tZ1})}{P_{tZ1}}$$

Where,

R = Expected return

$D_t$ = Dividend received at the time t

$P_{t-1}$= Starting stock price

$P_t$=Ending stock price

"Holding period return mention above is useful with an investment horizon of one year or less. For longer period it is better to calculate rate of returns as investment yield. The yield calculation is present value based and this considers the time value of money." (Van Horn and Watchtowers, 1997:10)

**Meaning of Risk**

Risk and return are the determinant for the valuation of securities. However, risk means that we do not know what is going to happen even though we occasionally

have a good idea of the range of possibilities that we face. In other words, when the firm moves to recognize that the forecast return may or may not be achieved. This is the element of risk in the decision making process. Therefore, risk may be defined as the "likelihood that the actual return from an investment will be less than the forecast return stated differently. It is the variability of return from an investment" (John J Hampton, 1996: 345)

"In the most basic sense, risk is the chance of financial loss. Assets having greater chances of loss are viewed as more risky than those with lesser chances of loss. More formally the term risk is used interchangeably with uncertainty to refer to the variability of returns associated with a given asset. (Lawrence J Gittmen, 2001:237)

**Risk on common stock**

Risk can be defined as the variability of possible returns around the expected return of an investment. For some investment this variability can be quite small. Each investor has his or her own attitude about risk and how much he/she tolerate. Since investment alternative have different types of risks associated with them. The investor must determine which combination of alternative matches his or her particular risk tolerances.

Investment on common stock is risky investment. Many investors consider risk as a chance of occurring some unfavorable event of danger of losing some value. Those investors who can tolerate higher level of risk should be rewarded with high value of returns. Intelligent investing involves combining investment alternatives in a portfolio that offer a fair return for the risk you are willing to assume.

Uncertainty and risk are treated separately in financial analysis. Risk is the unlooked and unwanted event in the future. Some one has said that risk is the sugar and salt of life. Although, risk arises from uncertainty its magnitude depends upon the degree of

variability in uncertain cash flow and it is measured in terms of standard deviation. In financial management the uncertainty of cash flow is translated into a mathematical value by calculating the expected value of all possible uncertain outcomes.

What created risk is an often asked question? Some external factors that cannot be controlled, and some internal factor, which cannot be controlled creates the risk, external factors that cannot be controlled called systematic risk. It includes mainly market risk, interest rate risk, and purchasing power risk. Internal factors that can be controlled are called unsystematic risk. It includes business risk, financial risk etc.

**Measuring Risk:**

We have already discussed above that the risk is a difficult concept to grasp and great deal of the controversy has surrounded attempt to define and measure it. To be most useful, any measure of risk should have definite value we need a measure of the lightness of the probability distribution. One such measure is the standard deviation, the symbol for which is (± ) pronounced sigma. To calculate the standard deviation, following steps should be taken:

Calculation of expected value:

$$\text{Expected Value } E(r) = \sum_{t\ X1}^{n} r_t\, p_t$$

Subtract the expected value, E(r), from each possible outcome deviation = r-E(r)

Square each deviation and multiply it by the probability occurrence of the applicable state of the economy, and then sum this product to obtain the variance ($\exists^2$)

$$\exists^2 = \text{Variance} = \text{Var}(r) = \sum_{t\ X1}^{n} P_t\,[r_t - E(r)]^2$$

The variance of return ($\sigma^{2)}$ for assets using historical returns is calculated

$$\text{Var}(r) = \sum_{t\ X1}^{n} \frac{[r_t\ Z E(r)]^2}{n\ Z1}$$

Take the square root of the variance to obtain the standard deviation. The square root of the variance of the rates of return is called the standard deviation ( ∃ ) of the rates of return.

$$\text{Standard Deviation } (\exists) = \sqrt{\sum_{t\ X1}^{n} \frac{[r_t\ Z E(r)]^2}{n\ Z1}}$$

The standard deviation and the variance are equally acceptable and conceptually equivalent quantitative measure of an assets total risk.

**Coefficient of variation:**

The other useful measure of risk is the coefficient of variation (C.V.). It is the standard deviation divided by the mean expected return, which measures risk per unit of return. The coefficient of variation should be used to compare investments when both the standard deviation and the expected values differ.

$$\text{Coefficient of variation} = \frac{\exists}{E(r)}$$

Where,

∃ =Standard deviation

E(r) = Expected rate of return

**Portfolio Theory**

Portfolio theory gives the concept of diversification of risk by investing the total funds in more than one type of asset or stocks. The concept of portfolio theory was developed by Harry M Markowitz. He explained that the risk could be reduced

without loosing considerable return by investing into portfolio. His approach to investing begins by assumption that an investor has a given sum of money to invest at the present time for a particular length of time which is known as “Holding Period”. This theory explains how investors should construct efficient portfolio by estimating portfolio risk and expected return under uncertain circumstances. However, before Markowitz the risk was talked, but was not quantified. The theory is also known as mean variance efficient portfolios and Markowitz efficient set of portfolios.

The base of portfolio is a well diversification. Efforts to spread and minimize risk take the form of diversification, However it is always a difficulty to find the right kind of diversification and the right reason. There were three types of diversification techniques before the Markowitz diversification technique came into scenario. One is simple diversification, second is superfluous diversification and third is diversification across industries.

Markowitz diversification is the combining of assets, which are less than perfectly positively correlated in order to reduce portfolio risk. It can sometimes reduce risk below the undiversifiable level. Markowitz diversification is more analytical than simple diversification and considers assets correlation or co-variances. The lower the correlation between assets, the more that Markowitz diversification will be able to reduce the portfolio’s risk.

**Return on Portfolio:**

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

The expected return on portfolio consisting of two securities will be

$E (Rp) = W_x X E (r_x) + Wy+E (r_y)$

Where,

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

E ($r_x$) = Expected return on security "X"

E ($r_y$) = Expected return on security "Y"

$W_x$ = Proportion of portfolio invested in security "X"

$W_Y$ = Proportion of portfolio invested in security "Y"

**Risk on Portfolio:**

Expected risk on a portfolio is a function of the proportions invested in the component, the riskiness of the component and correlation of returns on the component securities. It is measured by standard deviation.

Risk on portfolio is a weighted average risk. Therefore, the portfolio risk also accounts for co-variance between the returns of securities. Covariance is the product of the standard deviation of individual securities. The portfolio risk in the case of two-security portfolio can be computed as follows:

$$\pm_p X\sqrt{w_i^2\pm_i^2 \Gamma w_j^2\pm_j^2 \Gamma 2w_i w_j Cov_{ij}}$$

Where,

$\exists$ p = Portfolio standard deviation

Wi = Proportion of the portfolio devoted by security "i"

$\exists_i^2$ = Variance of security "i"

$\exists_j^2$ = Variance of security "j"

$Cov_{ij}$ = Covariance of stock i and j

$W_j$ = Proportion to the portfolio devoted by security j

**Systematic and Unsystematic Risk:**

A security (or assets) risk consists of two components diversifiable and non-diversifiable risk. Diversifiable risk which is called unsystematic risk or avoidable risk or company-specific risk or non – market risk. It is caused by events particular to

the firm. For e.g.-Labor strikes, management errors, inventions, advertising campaigns, shifts in consumer taste etc.

Non–diversifiable risk, which is also called systematic risk, is attributed to forces that affect all firms. It cannot be diversified away. It is also called marker risk or unavoidable risk or beta risk. It is caused due to war, inflation, recession, high interest rates, depressions, and long term changes in consumption in the economy.

Thus the total risk can be divided into two parts.

Total risk = Systematic risk + Unsystematic risk

$$\text{Var}(r_j) = b_j^2 \text{Var}(r_m) + \text{Var}(r_e)$$

Where,

$\text{Var}(r_j)$ =Total risk

$b_j^2 \text{Var}(r_m)$ =Market risk or systematic risk

$\text{Var}(r_e)$= Unsystematic or unique risk of the security.

**Review from Capital Assets Pricing Model (CAPM)**

The relevant risk for an individual asset is systematic risk (market- related risk) because non-market risk can be eliminated by diversification. The relationship between an asset's return and its systematic risk can be expressed by the CAPM, which is also called the security market line (SML). The equation for the CAPM is

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

Where, $E(R_j)$=Expected return for an asset.

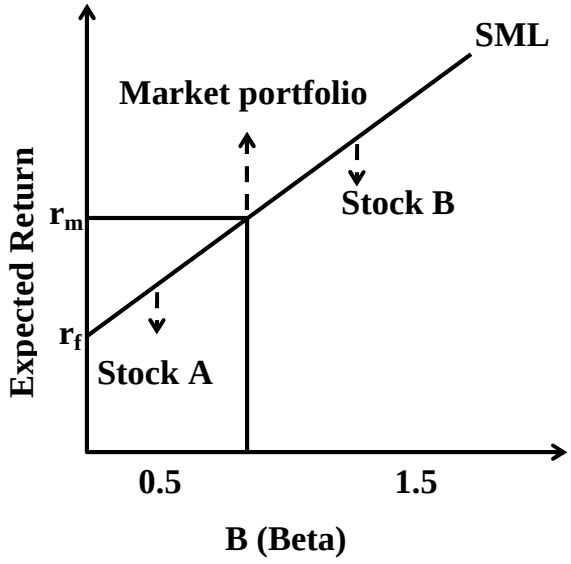
$R_f$ =Risk free rate of return.

$E(R_m)$ =Expected market return.

$B_j$ =Asset's beta

The CAPM is an equilibrium model for measuring the risk-return tradeoff for all assets including both inefficient and efficient portfolios. A graph of the CAPM is given in the figure.

That's what the CAPM says.




**2.2 <u>Reviews from Thesis</u>:**

However, risk and return is not a new concept of financial analysis, in context of Nepal and it's very slow growing capital market, very little studies are made regarding this topic. In this section some thesis are reviewed which have done on risk and return topic and the objective of this section is to know how the relation between risk and return is described and measured by different thesis.

"Mr. Sudeep Upadhyay". He has conducted the study in the title of "Risk and Return on Common Stock Investment of Commercial Bank in Nepal" (2001).

With the objectives to evaluate the common stock of the listed commercial banks in terms of risk and return and to perform sector wise comparison on the basis of market capitalization from the study. Mr. Upadhyay has find out that the common stock of

Nepal Grind lays Bank (Now Standard Chartered Bank) bears the maximum rate of return (127.84%) and SBI Bank has minimum (7.77%) rate of return. In the context of industries return of other sector is highest and manufacturing and production sector is found least performer.

This study has proved that "High Risk High Return" because in this study it has found common stock of NGBL is most risky and Nepal. SBI is least risky. Common stock of Everest Bank is most volatile. Common stock of Nepal Indosuez Bank is the least volatile and common stocks of all the commercial banks are overpriced. Mr. Upadhyay has recommended for the portfolio construction, to select the stock that has higher return with not correlated or negatively correlated stocks otherwise stock cannot be diversify risk properly. (Upadhyay, 2001).

"Miss Nisha Shakya.."She has done study in risk and return analysis in common stock investment which may helps in decision making about stock investment. The specific objective of this study is to assess the general investor's perception, attitude and awareness towards risk associated with return, to calculated risk and return of selected securities and their portfolio and to analyze the volatility of common stock and other valuates. Researchers find out that, 58.3% investors consider return and 33.3 percent investors consider risk before investing. To invest in common stock 50 percent prefer primary market, 21.67 percent prefer secondary and 28.3 percent of total investor prefers both markets. 71.7 percent of total investors give first preference to the banking sector. 46.7 percent investors have knowledge about correlation coefficient. 48.3 percent of total investor prefers C.V. and 36.7 percent prefer S.D. for measuring risk.

Miss Shakya recommended that, if negatively correlated assets are combined in portfolio them risk can be minimized to some extent. Only negatively correlated assets are favorable with view point of diversification. (Shakya, 2003)

Another study by Mr. Jeet Bahadur Sapkota, entitled “Risk and Return Analysis in Common Stock Investment” is a very closely related to this study. Researcher’s main objective of the study is to analyze the risk and return of the common stock in Nepalese stock market. This study is focused on the common stock of commercial banks. Mr. Sapkota in his study has concluded that “Commercial stock is the most risky security and lifeblood of stock market because of the highest expect so it attracts more investors. Private Cs holders are the passive owners of the company. But the private investor's plays a vital role in economic development of the nation by mobilizing the dispersed capital remained in different form in the society. But lack of information and poor knowledge, Nepalese private investors cannot analyze the securities as well as market property. (Sapkota, 2001)

Miss Sabina Shrestha has done study on the topic of “Risk and return analysis of commercial bank in Nepal”. So this study is closely related and helpful to this study. According to her, the relationship between risk and return is described by investor’s perception about risk and their demand for compensation. No investors will like to invest in risky assets unless he/she is assured of adequate compensation for the acceptance of risk. Hence risk plays a central role in the analysis of investment. Investors often ask about an investment and like to know if the risk will command higher premium.

Miss Shrestha has recommended that in comparison with inter industry, banking sector is more profitable. So, the stock of banking sector is found to have the highest return when it has the medium risk whereas manufacturing and processing sector is found to have the lowest return and lowest risk. Therefore, the investor may buy the stocks of banking sectors considering risk and return factor.

# CHAPTER –THREE

## RESEARCH METHODOLOGY

Research methodology is the systematic way of solving research problems. Research is systematic and organizational effort to investigate a specific problem that needs a solution. This process of investigation involves series of well thought out activities of gathering, recording, analyzing and interpreting the data with the purpose of finding answer to the problems. The main aim of the study is to analyze the importance of risk and return in our nation Nepal. The research work analyzes the topic with different dimensions. During the research work, I interviewed a number of business persons and bank personnel to know about risk and return along with their understanding on the matter. Generally, it describes about the research design, the population and the sample and sources of data and tools and techniques that will be used to analyze.

### 3.1 Research Design

Research design is the main part of the thesis or any research work. It is a plan, structure and strategy of investigation." By research design we mean an overall framework or plan for the collection and analysis of data" (Wolf and Pant, 2002). This research is on risk and return analysis and it is based on recent historical data, which covers the Six years data i.e. from the FY 1999/2000 to 2004/2005.It deals with the common stocks of commercial banks on the basis of available information. As the title of the study suggests, it is more analytical and empirical but less descriptive.

### 3.2 Sources of data

For the purpose of research, I basically prefer two types of information, i.e.

- Internal Information

- External Information

This information was collected with the help of both primary and secondary data.

**Primary Data**

Primary data are those collected by the researchers on the concerned topic, which are original in nature. While studying about risk and return, I came across primary data with sourced from the opinion of different people, questionnaire response, direct interviews etc.

**Secondary Data**

Secondary data are those collected by the researchers on the concerned topic, which are not original in nature or are originally collected for some other purpose. The secondary data constitute the chief material on the basis of which statistical work is carried out in many investigations. The required data are collected from the web page, different books related to risk and return, financial and statistical reports, journals and from the previous research studies.

### 3.3 Population and sample

The term population means large group. Due to its large group the data should be collected from each and every unit. However, the effort, money and time required for carrying out complete enumeration will generally be extremely large and in many cases may be so prohibitive that the very idea of collecting information may be dropped. The solution of this is the adoption of sampling techniques which is chosen to represent all the population. The sample allows the researchers more time to make an intensive study of a research problem. Therefore, for this study three commercial banks are taken as sample. They are

Himalayan Bank Ltd (HBL)

Nepal Everest Bank Ltd (EBL)

Nepal Arab Bank Ltd (NABIL)

### 3.4 Data Collection Procedure

The data collection procedure is summarized below:

- Financial documents provided by the company.
- Trading report published by Nepal stock exchange.
- Related websites.
- Materials published in papers and magazines.
- Other related books and booklets.

### 3.5 Tools and Techniques

The analysis of data has been done using several financial and statistical tools and techniques. The following tools are used to analyze the data which are presented in the study. The data presented in the study shall be analyzed by the following tools.

#### 3.5.1 Market Price of Stock (P)

Market price of stock is one of the major data of this study. There are three types of price i.e. high, low and closing price of each year which are available. We can use average price (high and low) or closing price of the stock. Closing price or average price represents the price of whole year. But, to get the real average volume and price of each transaction in the stock and duration of time of each transaction in the whole year are essential. It is very difficult to obtain and include these all information and average of high and low price in not reliable and representatives information. The closing price of stock is used as market price of stock.

#### 3.5.2 Dividend (D)

Dividend is relevant during the computation of rate of return, which reward to the shareholders for their investment. If company declares only cash dividend there is no problem while taking exact amount of dividend. But if company declares bonus shares, shareholders will receive extra number of shares consequently. To get a real

amount of dividend, there are no any models. So the model has been developed considering practical as well as theoretical aspect. At this situation,

Total dividend amount =Cash dividend +stock dividend% x next year's MPS

Some times the company issued right issued; at par. In this situation, we can calculate total dividend amount by this model.

Total dividend amount =Cash dividend +Right share% (Next year MPS – Price of right share)

Where,

MPS =Marker Price per Share

### 3.5.4 Return on common stock (Rj)

It is know as realized rate of return or single period rate of return. It is cash received plus price changes in period of stock (capital gain /loss). It is calculated in the form of percentage. It is calculated by adding change in market price with total dividend and than dividing by market price of previous year.

Symbolically,

$$\text{Return on common stock} = \frac{(Pt \; Z \, Pt \; Z1) \; \Gamma \; D1}{Pt \; Z1}$$

Where,

$P_{t-1}$=Starting stock price

$P_t$=Ending stock price

$D_1$=Cash dividend for time t.

### 3.5.4 Expected Rate of Return

One of the main objectives of the study is to calculate the expected rate of return on common stock. Generally, the rate is obtained by the arithmetic mean of the past year return.

Symbolically,

$$E(Rj) = \frac{Rj}{n}$$

Where,

E (Rj) = Expected rate of return on stock j

Rj = Return of stock j

n = Number of years that the return is taken

∑ = Sign of summation.

### 3.5.5 Standard Deviation (S.D. or *σ*):

The risk is measured in various ways. One of the popular statistical measures of an asset risk is the standard deviation. Standard deviation is a weighted average deviation from the expected value and it gives an idea of how far above and below the expected value with the actual value is likely to be. The larger standard deviation indicates a greater variation of returns. Standard deviation can be calculated by using the following formula.

$$\text{S.d or ó} = \sqrt{\frac{[R \text{ Z} E(R)]^2}{N \text{ Z} 1}}$$

Where ó = Sigma, denoted for standard deviation

R = Return

E (R) = Expected Return

N = No. of observation / No. of years.

### 3.5.6. Coefficient of variation:

Another useful measure to evaluate risky investment is the coefficient of variation. Coefficient of variation is defined as the ratio of the standard deviation to the expected return. It is the relative measurement of risk and return. It is used to standardize the risk per unit of return i.e. measure the risk per rupee. As the coefficient of variation increases, so does the risk of an asset.

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

ó = Standard Deviation

E (R) = Expected return

### 3.5.7 Beta coefficient (β)

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

$$Bj = \frac{Cov(r_j r_m)}{\exists_m^2}$$

Where,

Bj = Beta coefficient of stock j

Cov ($r_j$ $r_m$) = Covariance of return for security "j" with those of the market.

$$= \frac{[Ri \, Z E(Ri)][Rm \, Z E(Rm)]}{n \, Z 1}$$

### 3.5.8 Market Return ($R_m$):

Market return refers to the average return of the market as whole. The market return for this study has been obtained by taking differences between the endives, i.e. NEPSE index whose market dividend is ignored. It is calculated as,

$$R_m = \frac{NI_t \, Z \, NI_{t Z 1}}{NI_{t Z 1}}$$

Where,

$NI_t$ = NEPSE index at time "t"

$NI_{t-1}$ = NEPSE at time t-1

$R_m$ = Return of market

### 3.5.9 Expected Return on Market E (Rm)

It is average return of future expectation. It is calculated by summing up the past return and dividing by number of samples period.

$$E(R_m)\ X\frac{Rm}{n}$$

Where,

$E(R_m)$ =Expected return on market

$\sum (R_m)$ = Summation of market return

n = Number of samples period

### 3.5.10 Correlation Coefficient ($P_{ij}$)

The correlation is also a measure of the relationship between two assets. Its values are limited between the range of +1 and -1. Correlation and covariance are related by the following equation.

$$P_{ij}= \frac{Covij}{|i\ |j}$$

Where,

$P_{ij}$= Correlation coefficient for assets i and j.

$Cov_{ij}$ = Covariance between assets i and j.

$\partial i \partial_j$ = Standard deviation of return for assets i and j.

### 3.5.11 Portfolio Risk and Return.

A portfolio is a combination of investment assets. Investors have different types of investment opportunities but they have limited resources for investment. So that investors have to choose that investment opportunity which maximizes return for a given level of risk. Thus, portfolio management is related to the efficient portfolio investment in financial assets.

**Portfolio Return, E ($R_P$)**

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

Symbolically,

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

Where,

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

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

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

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

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

**Portfolio Risk**

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

$$\exists_P = \sqrt{\pm_A^2 W_A^2 \Gamma \pm_B^2 W_B^2 \Gamma 2 W_A W_B \circ_{AB} \pm_A \pm_B}$$

Where,

$\exists_P$ = Portfolio standard deviation

$\exists_A$ = Standard Deviation of security A

$\exists_B$ = Standard Deviation of security B

$W_A$ = the portion of the portfolio devoted by asset A

$W_B$ = the proportion of the portfolio devoted by asset B

$P_{AB}$ = Correlation between the assets A & B

### 3.5.12 Risk minimizing portfolio

It is the portfolio with the lowest level of risk in the efficient frontier. It is also called risk minimizing weight or optimal weight. In two- stock portfolio, the optimal weight to invest in stock A and B are calculated as follows:

$$W_A = \frac{\exists_B^{\,2} Z\partial_{AB}\exists_A\exists_B}{\exists_A^{\,2}\Gamma\exists_B^{\,2} Z 2p_{AB}\exists_A\exists_B}$$

$W_B = 1 - W_A$

W ere,

$W_A$ = Optimal weight to invest in stock A

$W_B$ = Optimal weight to invest in stock B

$ó^2_A$ = Variance of stock A

$ó^2_A$= Variance of stock B

$P_{AB}$ = Correlation between stock A and Stock B

### 3.5.13 Partitioning of total risk

The total variation of the rate of return for an individual security as measured by the standard deviation or variance of the rate of return. According to CAPM total risk can be divided into two parts. They are systematic risk and unsystematic risk.

Total Risk (σ) = Systematic Risk + Unsystematic Risk

**Systematic Risk**

Systematic risk is the portion of the total risk of an individual security caused by market factor that simultaneously affects the prices of all securities. It cannot be diversified away. It is also called market risk or unavoidable risk or non –diversifiable risk or beta risk. The systematic risk is the changes in interest rate, inflation, investors' expectation above the overall performance of the economy.

$$\text{Systematic Risk} = \frac{\partial_{AM}\exists_A\exists_M}{\exists_M}$$

$$= \rho_{AM}\,\sigma_A$$

OR,

$$\text{Systematic risk} = \frac{COV_{AM}}{\pm_{M}}$$

Where,

$\text{Cov}_{AM}$ = Covariance of return of assets A with market.

**Unsystematic Risk:**

Unsystematic risk is the portion of the total risk that can be diversified away. It is also called non-market risk or avoidable risk or company –specific risk or diversifiable risk. It is caused by events particular to the firm. For example: - Management errors, labor strikes, inventions, advertising campaigns, shifts in consumer tasted, etc.

$$\text{Unsystematic Risk} = \sigma_A - \frac{\text{Cov}_{AM}}{\exists_M}$$

$$= \sigma_A - \rho_{AM}\,\sigma_A$$

$$= \sigma_A\,(1-\rho_{AM}\sigma_A)$$

**Proportion of systematic risk and unsystematic risk**

The proportion of systematic risk indicates the percentage of variance of stock's return explained by the change in the market return and it cannot be diversified. The proportion of unsystematic risk indicates the % of variance of stock's return and is called unexplained variance which is firm specific risk and it can be diversified.

$$\rho^2 = \frac{B_j^{\,2}\exists_M^{\,2}}{\exists_j^{\,2}}$$

$$1 - \rho^2 = \frac{\text{Var}(e)}{\exists_j^{\,2}}$$

Where,

$\rho^2$ = Proportion of systematic risk

$1\text{-}P^2$ = Proportion of unsystematic risk

$\sigma_j^2$ = Variance of stock j

### 3.5.14 Required rate of return:

Required rate of return refers to the minimum return that an investor expects at least no to suffer from loss. It means if they get the return below the required rate of return they suffer from loss. SML gives required rate of return as follows:

$R_j = R_f + (R_M - R_f) B_j$

Where,

$R_j$ = required rate of return on stock J

$R_f$ = Risk face rate of return

$R_m$ = Market rate of return.

$B_j$ = Beta coefficient of stock J

## 3.6 Method of Analysis and Presentation

Results are presented in tabular form and clear interpretation on it is given simultaneously. All the method of analysis and presentation are applied as simple as possible. Detail calculations are shown in the report. To make the report more simple and easy charts, diagram and graphs have been used. Summary, conclusion and recommendations are presented finally.

# CHAPTER FOUR

## DATA PRESENTATION AND ANALYSIS

This chapter is the main part of study. In this chapter the effort has been made to analyze risk and return on common stock investments which include detail data of market price of share and dividend of each, selected commercial banks and their interpretation and analysis. With reference to the various readings and literature review in the preceding chapter effort is made to analyze the recent Nepalese stock market movement to the listed commercial banks. The analysis of data consists of organizing tabulating and assessing financial and statistical result. Different tables and diagrams are used to make the result easily understandable.

### 4.1 Analysis of Individual Commercial Banks

Three commercial banks are taken as sample for study among many banks listed in NEPSE. For every bank common stock on risk and return are analyzed properly. Market price per share (MPS) and dividend per share (DPS) of each selected banks are shown in the table below.

Risk and return is considered to be one of the best ways to analyze the behavior of changing market price of common stock. In this analysis it is attempted to find out periodical realized rate of return, its expected return or average rate of return, standard deviation, coefficient of variation. In the following paragraph each banks are introduced and their common stocks risk and return are analyzed here.

## Table No: 4.1

## Sample Companies Market Price per Share (MPS) and Dividend per Share (DPS)

| COMPANY NAME | | | FISCAL YEAR | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 1998/99 | 1999/00 | 2000/01 | 2001/02 | 2002/03 | 2003/04 | 2004/05 |
| Nepal Arab Bank Ltd. (NABIL) | MPS | High (Rs.) | 762 | 1495 | 2301 | 1500 | 875 | 1005 | 1515 |
| | | Low (Rs.) | 404 | 700 | 1310 | 465 | 700 | 705 | 1000 |
| | | Closing (Rs.) | 700 | 1400 | 1500 | 735 | 735 | 1000 | 1505 |
| | DPS | Cash (Rs.) | 50 | 55 | 40 | 30 | 50 | 65 | 70 |
| | | Stock (%) | - | - | 25 | - | - | - | - |
| Himalayan Bank Ltd. (HBL) | MPS | High (Rs.) | 1200 | 1780 | 2726 | 1530 | 950 | 1010 | 1181 |
| | | Low (Rs.) | 700 | 1000 | 1325 | 610 | 750 | 600 | 835 |
| | | Closing (Rs.) | 1000 | 1700 | 1500 | 1000 | 836 | 840 | 920 |
| | DPS | Cash (Rs.) | 50 | 50 | 27.5 | 25 | 1.31 | - | 11.58 |
| | | Stock (%) | - | 25 | 25 | 30 | 10 | 20 | 20 |
| Everest Bank Ltd. (EBL) | MPS | High (Rs.) | 440 | 980 | 1850 | 740 | 490 | 723 | 905 |
| | | Low (Rs.) | 184 | 400 | 670 | 325 | 349 | 400 | 625 |
| | | Closing (Rs.) | 407 | 980 | 750 | 430 | 445 | 680 | 870 |
| | DPS | Cash (Rs.) | - | - | - | - | 20 | 20 | - |
| | | Stock (%) | - | - | 100 | - | 22 | - | 20 |

### 4.1.1 Nepal Arab Bank Ltd (NABIL)

Nepal Arab Bank Ltd is the first joint venture commercial bank in Nepal which is joint venture of Nepalese promoters and Emirates Bank International (Dubai). It was established in 1984 AD (2041). Now, its 50% equity shares are hold by Emirates Bank International, 20% equity are hold by Nepalese promoters and Financial Institution and remaining 30% have been issued for general public of Nepal. The bank listed in NEPSE in 1986 AD. NABIL provides full range of commercial banking services. While doing business, its focal objective is to satisfy the customers. It is fully equipped with modern technology, which includes ATM, credit cards, state of art, world renewed software from Infosys Technologies system, Internet banking system and Telebanking system. The authorized capital issued capital and paid up capital of NABIL are Rs 50 crores, Rs 49.16 crores and Rs 49.10 crores respectively with par value of Rs 100 and total no. of equity outstanding 4909950 as on end of FY 2004/2005.

**Table no: 4.2**

**Market Price per Share and Dividend per Share of NABIL**

| Fiscal Year | High MPS | Low MPS | Closing MPS | DPS | Stock Div. | Total Div. |
|---|---|---|---|---|---|---|
| 1998/1999 | 762 | 404 | 700 | 50 | - | 50 |
| 1999/2000 | 1495 | 700 | 1400 | 55 | - | 55 |
| 2000/01 | 2301 | 1310 | 1500 | 40 | 25 | 223.75 |
| 2001/02 | 1500 | 465 | 735 | 30 | - | 30 |
| 2002/03 | 875 | 700 | 735 | 50 | - | 50 |
| 2003/04 | 1005 | 705 | 1000 | 65 | - | 65 |
| 2004/05 | 1515 | 1000 | 1505 | 70 | - | 70 |

[Data Source: NEPSE Index and AGM Report of NABIL]

**Market Price per Share and Dividend per Share of NABIL are shown below**

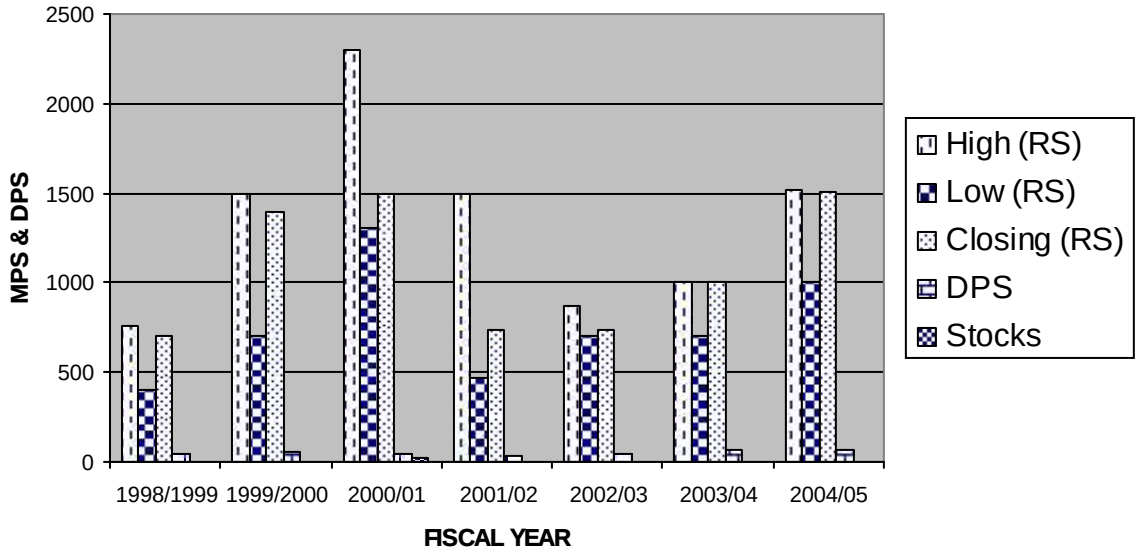



**Table no: 4.3**

**Annual Returns, Expected Rate of Return, S.D. and C.V. of NABIL**

| F/Y | **Closing Price** | **Dividend (D)** | $R = \frac{P_t - P_{t-1} + D_1}{P_{t-1}}$ | $(R - \bar{R})^2$ |
|---|---|---|---|---|
| 1998/1999 | 700 | 50 | - | - |
| 1999/2000 | 1400 | 55 | 1.0785 | 0.5774 |
| 2000/01 | 1500 | 223.75 | 0.2312 | 0.0076 |
| 2001/02 | 735 | 30 | -0.49 | 0.6538 |
| 2002/03 | 735 | 50 | 0.068 | 0.0628 |
| 2003/04 | 1000 | 65 | 0.4489 | 0.0169 |
| 2004/05 | 1505 | 70 | 0.575 | 0.0657 |
| **Total** | | | **1.9116** | **1.3842** |

Data Source: Table No: 4.2

We have,

Expected rate of return E(R) =∑R/n =1.9116/6 =0.3186

Std. Deviation ( ⊐ ) = $\sqrt{\frac{R\,Z\,\bar{R}^{\,2}}{n\,Z1}}\sqrt{\frac{1.3842}{6\,Z1}}\;X\,0.5261$

Coefficient of Variation = $\frac{\pm}{E(R)}\;X\frac{0.5261}{0.3186}\;X1.6512$

Expected rate of return (Trend Value) of each year are calculated on the basis of rate of return on common stock of NABIL by using least square method.

**Table No: 4.4**

**Year Wise Expected Rate of Return of NABIL**.

| FY | Rate of Return (Y) | Deviation from FY 2001/02 | XY | $X^2$ | Trend Value($Y_C$) |
|---|---|---|---|---|---|
| 1999/00 | 1.0785 | -2.5 | -2.6962 | 6.25 | 0.4118 |
| 2000/01 | 0.2312 | -1.5 | -0.3468 | 2.25 | 0.3745 |
| 2001/02 | -0.49 | -0.5 | 0.245 | 0.25 | 0.3372 |
| 2002/03 | 0.068 | 0.5 | 0.034 | 0.25 | 0.2999 |
| 2003/04 | 0.4489 | 1.5 | 0.6733 | 2.25 | 0.2627 |
| 2004/05 | 0.575 | 2.5 | 1.4375 | 6.25 | 0.2253 |
| **Total** | **1.9116** | **0** | **-0.6532** | **17.5** | |

Data Source: Table No: 4.3

We have,

The equation of trend line is $Y_c$ = a +bx

As $X$ X0, a = $\frac{Y}{n}$ X$\frac{1.9116}{6}$ X0.3186

b= $\frac{XY}{X^2}$ X$\frac{Z0.6532}{17.5}$ XZ0.0373

Here,

Trend Line $Y_C$ =0.3186 + (-0.0373) X

When X=2.5 =0.3186 + (-0.0373) (-2.5) =0.4118

X=-1.5 =0.3186+ (-0.0373) (-1.5) =0.3745

X=-0.5 =0.3186+ (-0.0373) (-0.5) = 0.3372

X=0.5 =0.3186+ (-0.0373) (0.5) =0.2999

X=1.5 =0.3186+ (-0.0373) (1.5) = 0.2627

X=2.5=0.3186 + (-0.0373) (2.5) = 0.2253

### 4.1.2 Himalayan Bank Ltd (HBL)

Himalayan Bank Ltd is a joint venture commercial bank with Habib Bank Ltd of Pakistan which was established in 1992 AD. This is the first joint venture bank managed by Nepalese Chief Executive. The main objective of the bank is to provider modern banking facilities like tale –banking to businessman, industrialists, and other profession. It also provides loan to agriculture and industrial sector. Now, its 20% shares are hold by Habib Bank of Pakistan and 80% equity hold by Nepalese promoters, financial institutions, organized institution, general public and others. The authorized capital is Rs 100crores and issued capital is 65 crores. The paid up value is Rs 53.625 crores with 5250000 numbers of equity shares outstanding as on end of FY 2004/05. The shares were listed in Nepal Stock Exchange Ltd on 2050.03.21B.S.

**Table no: 4.5**

**Market Price per Share and Dividend per Share of HBL**

| Fiscal Year | High MPS | Low MPS | Closing MPS | DPS | Stock Div. | Total Div. |
|---|---|---|---|---|---|---|
| 1998/1999 | 1200 | 700 | 1000 | 50 | - | 50 |
| 1999/2000 | 1780 | 1000 | 1700 | 50 | 25 | 425 |
| 2000/01 | 2726 | 1325 | 1500 | 27.5 | 25 | 277.5 |
| 2001/02 | 1530 | 610 | 1000 | 25 | 30 | 275.8 |
| 2002/03 | 950 | 750 | 836 | 1.31 | 10 | 85.31 |
| 2003/04 | 1010 | 600 | 840 | - | 20 | 184 |
| 2004/05 | 1181 | 835 | 920 | 11.58 | 20 | 231.58 |

[Data Source: NEPSE Index and AGM Report of HBL]

**Market Price per Share and Dividend per Share of HBL are shown below**

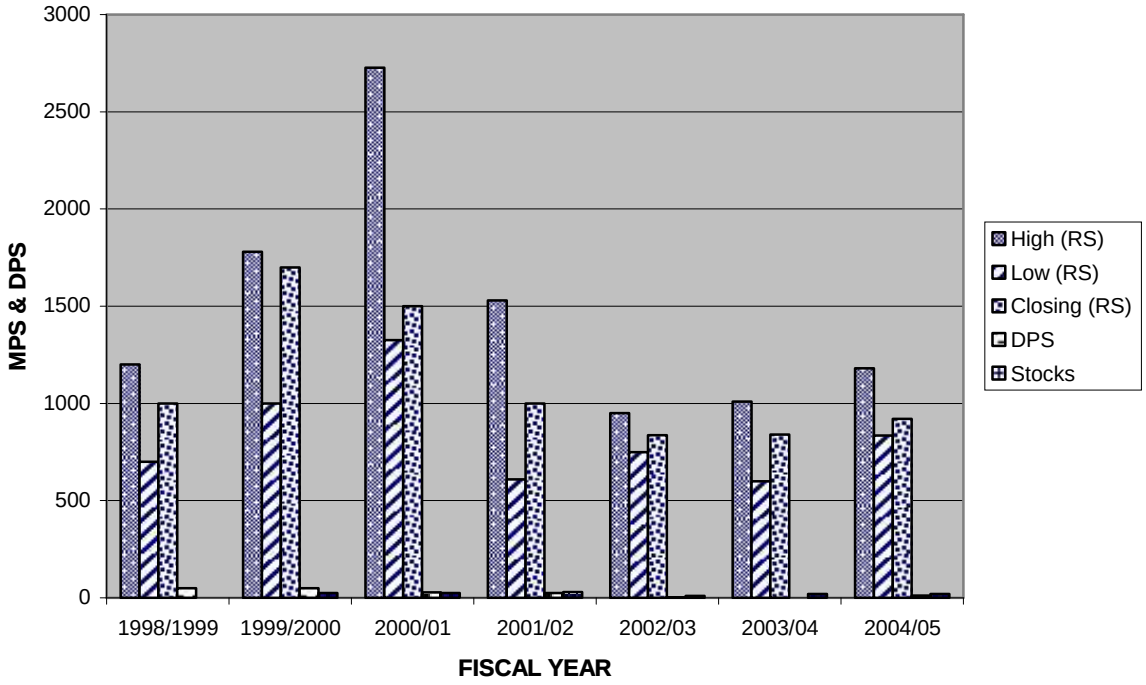


**Table no: 4.6**

**Annual Returns. Expected rate of return S.D. and C.V. of HBL**

| F/Y | Closing Price | Total Div. (D) | $R = \frac{D_1 + (P_1 - P_{t-1})}{P_{t-1}}$ | $R - \bar{R}$ | $(R - \bar{R})^2$ |
|---|---|---|---|---|---|
| 1998/99 | 1000 | 50 | - | - | - |
| 1999/00 | 1700 | 425 | 1.125 | 0.8687 | 0.7546 |
| 2000/01 | 1500 | 277.5 | 0.0455 | -0.2108 | 0.0444 |
| 2001/02 | 1000 | 275.8 | -0.1494 | -0.4057 | 0.1645 |
| 2002/03 | 836 | 85.31 | -0.0786 | -0.3349 | 0.1121 |
| 2003/04 | 840 | 184 | 0.2248 | -0.0315 | 0.0009 |
| 2004/05 | 920 | 231.58 | 0.3709 | 0.1146 | 0.0131 |
| **Total** | | | **1.5382** | | **1.0896** |

Data Source: Table No: 4.5

We have,

Expected rate of return $\bar{R} = \frac{R}{N} = \frac{1.5382}{6} = 0.2563$

Standard Deviation $= \pm \sqrt{\frac{(R - \bar{R})^2}{n-1}} = \sqrt{\frac{1.0896}{6-1}} = 0.4668$

Coefficient of variation (C.V ) $= \frac{\pm}{E(R)} = \frac{0.4668}{0.2563} = 1.8213$

Expected rate of return (Trend Value) for each year are calculated on the basis of rate of return on common stock of HBL by using least square method.

**Table No: 4.7**

**Year Wise Expected Rate of Return of HBL**.

| FY | Rate of Return (Y) | Deviation from FY2001/02(X) | XY | $X^2$ | Trend Value ($Y_c$) |
|---|---|---|---|---|---|
| 1999/00 | 1.125 | -2.5 | -2.8125 | 6.25 | 0.4820 |
| 2000/01 | 0.0455 | -1.5 | -0.0682 | 2.25 | 0.3917 |
| 2001/02 | -0.1494 | -0.5 | 0.0747 | 0.25 | 0.3014 |
| 2002/03 | -0.0786 | 0.5 | -0.0393 | 0.25 | 0.2111 |
| 2003/04 | 0.2248 | 1.5 | 0.3372 | 2.25 | 0.1208 |
| 2004/05 | 0.3709 | 2.5 | 0.9272 | 6.25 | 0.0305 |
| **Total** | **1.5382** | **0** | **-1.5809** | **17.5** | |

Data Source: Table No: 4.6

We have,

The equation of trend line is $Y_c = a + bx$

As $X$ X0, a = $\frac{Y}{n}$ X$\frac{1.5382}{6}$ X0.2563

b= $\frac{XY}{X^2}$ X$\frac{Z1.5809}{17.5}$ XZ0.0903

Here,

Trend Line $Y_C$ =0.2563+ (-0.0903) X

When X=-2.5 =0.2563+ (-0.0903) (-2.5) =0.4820

X=-1.5 =0.2563+ (-0.0903) (-1.5) =0.3917

X=-0.5 =0.2563 + (-0.0903) (-0.5) = 0.3014

X=0.5 =0.2563 (-0.0903) (0.5) =0.2111

X=1.5 =0.2563 + (-0.0903) (1.5) = 0.1208

X=2.5=0.2563+ (-0.0903) (2.5) =0.0305

### 4.1.3. Everest Bank Ltd (EBL)

Everest Bank Ltd was established in 1994 A.D (2051 B.S) under the company act 1964 with an objective of carrying out commercial banking activities under the commercial bank act 1974. EBL joined hands with Punjab National Bank (PNB). India as its joint venture partner in 1997. PNB is the largest nationalized bank having 110 years of banking history with more than 4500 offices all over the India of which 1400 branches are interconnected .PNB has over 1000 ATM spreads across India.

EBL is playing a pivotal role in facilitating remittance to and from across globe. The bank has Draft Drawing Arrangements with 175 branches of PNB all over the India. With an aim to facilitate the remittance of Nepalese citizens working abroad, the bank has entered into arrangements with renowed banks and exchange companies across the globe. It provides complete range of services.

**Table no: 4.8**

**Market Price per Share and Dividend per Share of EBL**

| Fiscal Year | High MPS | Low MPS | Closing MPS | DPS | Stock Div. | Total Div. |
|---|---|---|---|---|---|---|
| 1998/1999 | 440 | 184 | 407 | 0 | 0 | 0 |
| 1999/2000 | 980 | 400 | 980 | 0 | 0 | 0 |
| 2000/01 | 1850 | 670 | 750 | 0 | 100 | 430 |
| 2001/02 | 740 | 325 | 430 | 0 | 0 | 0 |
| 2002/03 | 490 | 349 | 445 | 20 | 22 | 169.6 |
| 2003/04 | 723 | 400 | 680 | 20 | 0 | 20 |
| 2004/05 | 905 | 625 | 870 | 0 | 20 | 275.8 |

[Data Source: NEPSE Index &AGM report.]

**Market Price per Share and Dividend per Share of EBL are shown below**

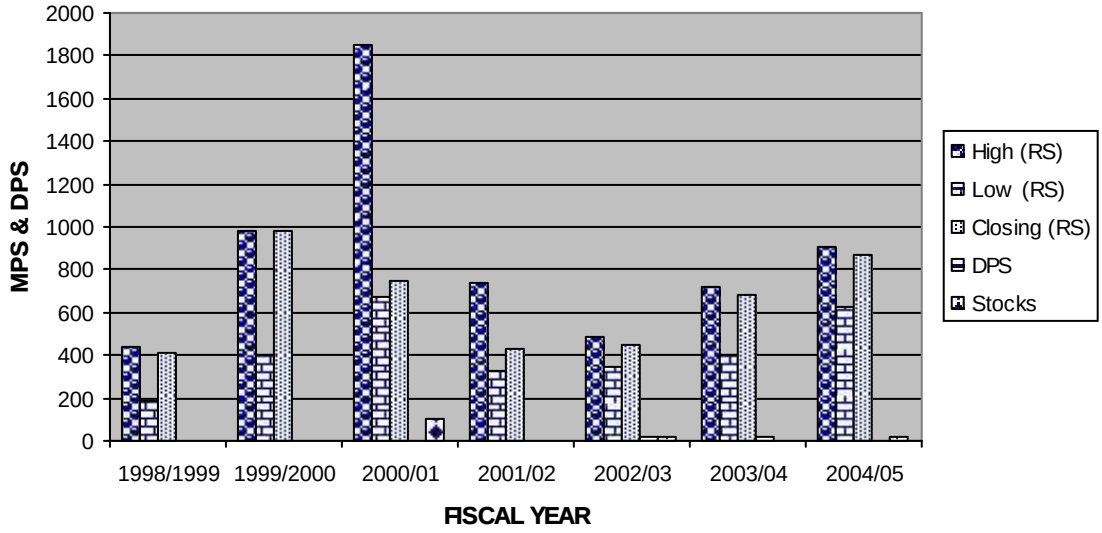



**Table no: 4.9**

**Annual Returns, Expected rate of return, S.D, and C.V. of EBL**

| F/Y | **Closing Price** | **Total Div. (D)** | $R = \frac{D_1 + (P_1 - P_{t-1})}{P_{t-1}}$ | $(R - \bar{R})$ | $(R - \bar{R})^2$ |
|---|---|---|---|---|---|
| 1998/99 | 407 | - | - | - | - |
| 1999/00 | 980 | - | 1.4078 | 0.9291 | 0.8632 |
| 2000/01 | 750 | 430 | 0.2040 | -0.2747 | 0.0754 |
| 2001/02 | 430 | - | -0.4266 | -0.9053 | 0.8195 |
| 2002/03 | 445 | 169.6 | 0.4293 | -0.0494 | 0.0024 |
| 2003/04 | 680 | 20 | 0.5730 | 0.0943 | 0.0088 |
| 2004/05 | 870 | 275.8 | 0.685 | 0.2063 | 0.0425 |
| **Total** | | | **2.8725** | | **1.8118** |

Data Source: Table No: 4.8

We have,

Expected rate of return $\bar{R}$ X$\frac{R}{N}$ X$\frac{2.8725}{6}$ X0.4787

Standard Deviation $\pm$ AX$\sqrt{\frac{R\,Z\,\bar{R}^{2}}{n\,Z1}}$ X$\sqrt{\frac{1.8118}{6\,Z1}}$ X0.6019

Coef f icient of variation (C.V ) = $\frac{\pm}{E(R)}$ = $\frac{0.6019}{0.4787}$ X1.2573

Expected rate of return (Trend Value) for each year are calculated on the basis of rate of return on common stock of HBL by using least square method.

**Table No: 4.10**

**Year Wise Expected Rate of Return of EBL.**

| FY | Rate of Return (Y) | Deviation from FY2001/029(X) | XY | $X^2$ | Trend Value ($Y_c$) |
|---|---|---|---|---|---|
| 1999/00 | 1.4078 | -2.5 | -3.5195 | 6.25 | 0.5052 |
| 2000/01 | 0.2040 | -1.5 | -0.306 | 2.25 | 0.4946 |
| 2001/02 | -0.4266 | -0.5 | 0.8532 | 0.25 | 0.484 |
| 2002/03 | 0.4293 | 0.5 | 0.2146 | 0.25 | 0.4734 |
| 2003/04 | 0.5730 | 1.5 | 0.8595 | 2.25 | 0.4628 |
| 2004/05 | 0.685 | 2.5 | 1.7125 | 6.25 | 0.4522 |
| Total | 2.8725 | 0 | -0.1857 | 17.5 | |

Data Source: Table No: 4.9

We have,

The equation of trend line is $Y_c$ = a +bx

As $X$ X0, a = $\frac{Y}{n}$ X$\frac{2.8725}{6}$ X0.4787

$$b = \frac{XY}{X^2} X \frac{Z0.1857}{17.5} XZ0.0106$$

Here,

Trend Line $Y_C$ =0.4787 + (-0.0106) X

When X= -2.5 = 0.4787 + (-0.0106) (-2.5) = 0.5052

X= -1.5 = 0.4787 + (-0.0106) (-1.5) = 0.4946

X= -0.5 = 0.4787 + (-0.0106) (-0.5) = 0.484

X= 0.5 =0.4787 (-0.0106) (0.5) = 0.4734

X=1.5 =0.4787 + (-0.0106) (1.5) = 0.4628

X= 2.5= 0.4787 + (-0.0106) (2.5) = 0.4522

## 4.2 Inter -Bank Comparison

### On the Basis of Risk and Return Analysis

After analyzing the expected returns, standard deviation, coefficient of variation of sample banks from the FY1999/00 to 2004/05. The results are presented in the following table 4.11.

**Table No: 4.11**

| S.N | Sample Banks | Expected Return | Standard Deviation | Coefficient of Variation | Remarks | | |
|---|---|---|---|---|---|---|---|
| | | | | | E(R) | ± | CV |
| 1 | NABIL | 0.3186 | 0.5261 | 1.6512 | | | |
| 2 | HBL | 0.2563 | 0.4668 | 1.8213 | Lowest | Lowest | Highest |
| 3 | EBL | 0.4787 | 0.6019 | 1.2573 | Highest | Highest | Lowest |

Data Source: Result from section 4.1

The table shows that the expected rate of return and standard deviation are higher in EBL than other sample banks. HBL has the lowest return and risk among others. C.V

measures the risk per unit. C.V of common stock of EBL is minimum than others. Minimum C.V indicate the lower risk. To earn one unit of return an investor has to bear 1.2573 unit of risk by investing in EBL.

### 4.3 Portfolio and Risk Diversification Analysis

Portfolio is a combination of more than two types of assets for the investment. In this study the portfolio analysis has done to find out that portfolio return is more than the individual security's return. To invest in single security it is risky, but to be relatively safe if hold in a portfolio. The major objective of portfolio analysis is to suggest the assets for investment that stabilized the earning and minimize the risk.

To calculate portfolio return and risk, we have to calculate co-variance between two securities. Table No: 4.12 show the calculation of covariance return on common stock of NABIL and HBL

**Table No: 4.12**

**Covariance on common stock of NABIL and HBL**

| F/Y | $R_{NABIL} - \overline{R}_{NABIL}$ | $R_{HBL} - \overline{R}_{HBL}$ | $(R_{NABIL} - \overline{R}_{NABIL})(R_{HBL} - \overline{R}_{HBL})$ |
|---|---|---|---|
| 1999/00 | 0.7599 | 0.8687 | 0.6601 |
| 2000/01 | -0.0874 | -0.2108 | 0.0184 |
| 2001/02 | -0.8086 | -0.4057 | 0.3280 |
| 2002/03 | -0.2506 | -0.3349 | 0.0839 |
| 2003/04 | 0.1303 | -0.0315 | -0.0041 |
| 2004/05 | 0.2564 | 0.1146 | 0.0293 |
| **Total** | | | **1.1156** |

Data Source: Table No: 4.3 & 4.6

We have,

$$COV_{NABIL,\ HBL} = \frac{\sum\{R_{NABIL} - E(R_{NABIL})\}\{R_{HBL} - E(R_{HBL})\}'}{n - 1}$$

$$= \frac{1.1156}{6 - 1} \times 0.2231$$

Now, with the help of $COV_{NABIL,\ HBL}$ we can calculate optimal weight of stock of NABIL &HBL which minimizes the risk.

$$W_{NABIL} = \frac{\sigma^2_{HBL} - Cov(R_{NABIL,} R_{HBL})}{\sigma^2_{NABIL} + \sigma^2_{HBL} - 2Cov(R_{NABIL}, R_{HBL})}$$

$$= \frac{0.2179 - 0.2231}{0.2768 + 0.2179 - 2(0.2231)} = \frac{-0.0052}{0.0485} \times -0.1072$$

Where,

$W_{HBL}$=1-$W_{NABIL}$

=1-(-0.1072)

=1.1072

Here,

$W_{NABIL}$=Proportion or weight to invest in stock of NABIL.

$\sigma^2_{NABIL}$ =Variance of stock of NABIL.

$\sigma^2_{HBL}$ =Variance of stock of HBL.

$W_{HBL}$ =Proportion or weight to invest in stock of HBL.

If an asset has negative weight, two economic interpretations are possible. First negative weight can be used to represent a short sale. Secondly a negative weight may indicate that investor created a levered or borrowed or margined portfolio by selling or issuing a security that has the same risk and return statistics as the assets with the negative weights.

Negative weight of stock of NABIL represents the amount borrowed from the stock of NABIL i.e. the sales proceeds received from the short sale of stock of NABIL and its own funds, both are invested in the stock of HBL bank. Therefore, it can be said that if we construct a portfolio with only positive weights than such a portfolio is known as lending portfolio and if we construct a portfolio with negative weights, than such a portfolio is called borrowing portfolio.

Therefore, it can be concluded that portfolio of stock of NABIL &HBL are called borrowing portfolio and lending portfolio.

Now, we can calculate portfolio return and risk of NABIL& HBL. Portfolio return is the sum of returns on individual securities multiplied by their respective weights.

We have,

$$E(R_P) = W_{NABIL} \times E(R_{NABIL}) + W_{HBL} \times E(R_{HBL})$$
$$= (-0.1072) \times 0.3186 + 1.1072 \times 0.2563$$
$$= -0.0341 + 0.2837$$
$$= 0.2496 \text{ or } 24.96\%$$

Portfolio risk is given as:

$$\pm_P = \sqrt{\pm^2_{NABIL} \mid W^2_{NABIL} \Gamma \pm^2_{HBL} \mid W^2_{HBL} \Gamma 2W_{NABIL} \mid W_{HBL} \mid Cov(R_{NABIL}, R_{HBL})}$$
$$= \sqrt{0.2768 \mid (Z0.1072)^2 \Gamma 0.2179 \mid (1.1072)^2 \Gamma 2(Z0.1072) \mid 1.1072 \mid 0.2231}$$
$$= \sqrt{0.2702 \, Z0.0529} \; X0.4661$$

Using the diversification, we can reduce the risk. Standard deviation of NABIL & HBL was 0.5261 &0.4668 respectively before the diversification. But now after the portfolio construction the risk minimizes to 0.4661.

**Correlation between common stock of NABIL & HBL stocks**.

We know that,

$$\circ_{NABIL,HBL} = \frac{Cov(R_{NABIL,} R_{HBL})}{\pm_{NABIL} \mid \pm_{HBL}}$$

$$= \frac{0.2231}{0.5261 \mid 0.4668} \times \frac{0.2231}{0.2455} \times 0.9087$$

The correlation between the return of the two securities plays a significant role in the risk reduction by portfolio construction. If the correlation is perfectly positive i.e. 1, than the portfolio cannot reduce any level of risk. And if the correlation is perfectly negative i.e. -1, than the proper combination of the two securities can reduce unsystematic risk even up to zero. It means the positive correlation between securities is not so beneficial and vice-versa. Here in case of portfolio of NABIL'S and HBL'S common stock, the correlation is positive. That's why the portfolio construction between these two securities is not so beneficial in terms of risk reduction.

**Table No: 4.13**

**Covariance on common stock of NABIL & EBL**

| FY | $\bullet R_{NABIL} \; Z E(R_{NABIL})'$ | $\bullet R_{EBL} \; Z E(R_{EBL})'$ | $\bullet R_{NABIL} \; Z E(R_{NABIL})' \bullet R_{EBL} \; Z E(R_{EBL})'$ |
|---|---|---|---|
| 1999/00 | 0.7599 | 0.9291 | 0.7060 |
| 2000/01 | -0.0874 | -0.2747 | 0.0240 |
| 2001/02 | -0.8086 | -0.9053 | 0.7320 |
| 2002/03 | 0.2506 | -0.0494 | 0.0124 |
| 2003/04 | 0.1303 | 0.0943 | 0.0122 |
| 2004/05 | 0.2564 | 0.2063 | 0.0528 |
| **Total** | | | **1.5394** |

Data Source: Table No: 4.3 & 4.9

We have,

$$\text{Cov } (R_{NABIL,} R_{EBL}) = \frac{\bullet\{R_{NABIL} \; Z E(R_{NABIL})\}\{R_{EBL} \; Z E(R_{EBL})\}'}{n \; Z 1} \times \frac{1.5394}{6 \; Z 1} \times 0.3078$$

Now, with the help of Cov ($R_{NABIL}$,$R_{EBL}$), we can calculate optimal weight of stock of NABIL & EBL which minimizes the risk.

$$W_{NABIL} = \frac{\pm^2_{EBL} - Cov(R_{NABIL}, R_{EBL})}{\pm^2_{NABIL} + \pm^2_{EBL} - 2Cov(R_{NABIL}, R_{EBL})}$$

$$= \frac{0.3622 - 0.3078}{0.2768 + 0.3622 - 2 \times 0.3078} \times \frac{0.0544}{0.0234} \times 2.3247$$

Where,

$W_{EBL}$ = 1-$W_{NABIL}$

= 1-2.3247

= (-1.3247)

Here,

$W_{NABIL}$ =Proportion or weight to invest in stock of NABIL.

$\pm^2_{NABIL}$ =Variance of stock of NABIL.

$\pm^2_{EBL}$ =Variance of stock of EBL.

$W_{EBL}$ =Proportion or weight to invest in stock of EBL.

If an asset has negative weight, two economic interpretations are possible. First negative weight can be used to represent a short sale. Secondly a negative weight may indicate that investor created a levered or borrowed or margined portfolio by selling or issuing a security that has the same risk and return statistics as the assets with the negative weights.

Negative weight of stock of EBL represents the amount borrowed from the stock of EBL i.e. the sales proceeds received from the short sale of stock of EBL and its own funds, both are invested in the stock of NABIL bank. Therefore, it can be said that if we construct a portfolio with only positive weights than such a portfolio is known as

lending portfolio and if we construct a portfolio with negative weights, then such a portfolio is called borrowing portfolio.

Therefore, it can be concluded that portfolio of stock of NABIL &EBL are called borrowing portfolio and lending portfolio.

Now, we can calculate portfolio return and risk of NABIL& EBL. Portfolio return is the sum of returns on individual securities multiplied by their respective weights.

We have,

$E(R_P) = W_{NABIL} \mid E(R_{NABIL}) \Gamma W_{EBL} \mid E(R_{EBL})$

$=2.3247 \mid 0.3186 \Gamma (Z1.3247) \mid 0.4787$

$=0.7406-0.6341 = 0.1065$ or10.65%

**Portfolio Risk is given as:**

$$\pm_{\circ} X\sqrt{\pm^{2}_{NABIL} \mid W^{2}_{NABIL} \Gamma \pm^{2}_{EBL} \mid W^{2}_{EBL} \Gamma 2W_{NABIL} \mid W_{EBL} \mid Cov(R_{NABIL}, R_{EBL})}$$

$$= \sqrt{0.2768 \mid (2.3247)^{2} \Gamma 0.3622 \mid (Z1.3247)^{2} \Gamma 2 \mid 2.3247 \mid (Z1.3247) \mid 0.3078}$$

$$= \sqrt{O.2356}\, X 0.4854$$

Using the diversification, we can reduce the risk. Standard deviation of NABIL & EBL was 0.5261 & 0.6019 respectively before the diversification. But after portfolio construction the risk minimizes to 0.4854.

**Calculation of correlation between NABIL & EBL stocks.**

We know that,

$$\circ_{NABIL,EBL} \text{X} \frac{Cov(R_{NABIL}, R_{EBL})}{\pm_{NABIL} \mid \pm_{EBL}}$$

$$= \frac{0.3078}{0.5261 \mid 0.6019} \text{X} \frac{0.3078}{0.3166} \text{X} 0.9722$$

The correlation between the return of the two securities plays a significant role in the risk reduction by portfolio construction. If the correlation is perfectively positive i.e. 1, than the portfolio cannot reduce any level of risk. And if the correlation is perfectly negative i.e. -1, than the proper combination of the two securities can reduce unsystematic risk even up to zero. It means the positive correlation between securities is not so beneficial and vice-versa. Here in case of portfolio of NABIL'S and EBL'S common stock, the correlation is positive. That's why the portfolio construction between these two securities is not so beneficial in terms of risk reduction.

**Table No: 4.14**

**Covariance on common stock of HBL & EBL**.

| Year | $[R_{HBL}-E(R_{HBL})]$ | $[R_{EBL}-E(R_{EBL})]$ | $[R_{HBL}-E(R_{HBL})][R_{EBL}-E(R_{EBL})]$ |
|---|---|---|---|
| 1999/00 | 0.8687 | 0.9291 | 0.8071 |
| 2000/01 | -0.2108 | -0.2747 | 0.0579 |
| 2001/02 | -0.4057 | -0.9053 | 0.3672 |
| 2002/03 | -0.3349 | -0.0494 | 0.0165 |
| 2003/04 | -0.0315 | 0.0943 | -0.0029 |
| 2004/05 | 0.1146 | 0.2063 | 0.0236 |
| **Total** | | | **1.2694** |

Data Source: Table No: 4.6 & 4.9

We have,

$$\text{Cov } (R_{HBL},R_{EBL}) = \frac{\P\{R_{HBL} \text{ Z} E(R_{HBL})\}\{R_{EBL} \text{ Z} E(R_{EBL})\}'}{n \text{ Z} 1}$$

$$= \frac{1.2694}{6 \text{ Z} 1} \text{X} 0.2538$$

Now, with the help of Cov ($R_{HBL}$,$R_{EBL}$), we can calculate optimal weight of stock of HBL &EBL which minimizes the risk.

$$W_{HBL} = \frac{\pm^2_{EBL} - Cov(R_{HBL}, R_{EBL})}{\pm^2_{HBL} + \pm^2_{EBL} - 2Cov(R_{HBL}, R_{EBL})}$$

$$= \frac{0.3622 - 0.2538}{0.2179 + 0.3622 - 2 \times 0.2538}$$

$$= \frac{0.1084}{0.5801 - 0.5076} \text{ X} \frac{0.1084}{0.0725} \text{ X} 1.4951$$

… $W_{EBL} = 1 - W_{HBL}$

$= 1 - 1.4951$

$= -0.4951$

Here,

$W_{HBL}$ = Proportion or weight to invest in stock of HBL.

$W_{EBL}$ = Proportion or weight to invest in stock of EBL.

$\pm^2_{EBL}$ =Variance of stock of EBL.

$\pm^2_{HBL}$ = Variance of stock of HBL.

If an asset has negative weight, two economic interpretations are possible. First negative weight can be used to represent a short sale. Secondly a negative weight may indicate that investor created a levered or borrowed or margined portfolio by selling or issuing a security that has the same risk and return statistics as the assets with the negative weights.

Negative weight of stock of EBL represents the amount borrowed from the stock of EBL i.e. the sales proceeds received from the short sale of stock of EBL and its own funds, both are invested in the stock of HBL bank. Therefore, it can be said that if we construct a portfolio with only positive weights than such a portfolio is known

as lending portfolio and if we construct a portfolio with negative weights, then such a portfolio is called borrowing portfolio.

Therefore, it can be concluded that portfolio of stock of HBL &EBL are called borrowing portfolio and lending portfolio.

Now, we can calculate portfolio return and risk of HBL & EBL. Portfolio return is the sum of returns on individual securities multiplied by their respective weights.

We have,

$$E(R_P) = W_{HBL} \times E(R_{HBL}) + W_{EBL} \times E(R_{EBL})$$

$$= 1.4951 \times 0.2563 + (-0.4951) \times 0.4787$$

$$= 0.3831 - 0.2370$$

$$= 0.1461 \text{ or } 14.61\%$$

Portfolio risk is given as:

$$\sigma_P = \sqrt{\sigma_{HBL}^2 \times W_{HBL}^2 + \sigma_{EBL}^2 \times W_{EBL}^2 + 2 W_{HBL} \times W_{EBL} \times Cov(R_{HBL}, R_{EBL})}$$

$$= \sqrt{0.2179 \times (1.4951)^2 + 0.3622 \times (-0.4951)^2 + 2 \times 1.4951 \times (-0.4951) \times 0.2538}$$

$$= \sqrt{0.2} = 0.4472$$

Using the diversification, we can reduce the risk. Standard deviation of HBL & EBL was 0.4668 &0.6019 respectively before the diversification. But after the portfolio construction the risk minimizes to 0.4472.

**Calculation of correlation between HBL & EBL stocks.**

We know that,

$$\rho_{HBL,EBL} = \frac{Cov(R_{HBL}, R_{EBL})}{\sigma_{HBL} \times \sigma_{EBL}}$$

$$= \frac{0.2538}{0.4668 \times 0.6019}$$

$$= 0.9035$$

The correlation between the return of the two securities plays a significant role in the risk reduction by portfolio construction. If the correlation is perfectively positive i.e. 1,than the portfolio cannot reduce any level of risk. And if the correlation is perfectly negative i.e. -1, than the proper combination of the two securities can reduce unsystematic risk even up to zero. It means the positive correlation between securities is not so beneficial and vice-versa. Here in case of portfolio of HBL'S common stock and EBL'S common stock, the correlation is positive. That's why the portfolio construction between these two securities is not so beneficial in terms of risk reduction.

### 4.4 Analysis of Market Risk and Return

**Table No: 4.15**

**Rate of return, Expected return, Standard deviation and Coefficient of Variation of Market.**

| FY | NEPSE Index (NI) | $R_m = \frac{NI_t \; Z \; NI_{tZ1}}{NI_{tZ1}}$ | $[R_m - E(R_m)]$ | $[R_m \; Z \; E(R_m)]^2$ |
|---|---|---|---|---|
| 1998/99 | 216.92 | - | - | - |
| 1999/00 | 360.70 | 0.6628 | 0.57 | 0.3249 |
| 2000/01 | 348.43 | -0.0340 | -0.1268 | 0.0160 |
| 2001/02 | 227.54 | -0.3469 | -0.4397 | 0.1933 |
| 2002/03 | 204.80 | -0.0999 | -0.1927 | 0.0371 |
| 2003/04 | 222.04 | 0.0841 | -0.0087 | 0.0001 |
| 2004/05 | 286.67 | 0.2910 | 0.1982 | 0.0392 |
| **Total** | | **0.5571** | | **0.6106** |

Data Source: NEPSE Index

We have,

$$\text{Expected rate of return, E } (R_m) = \frac{R_m}{n} \text{ X} \frac{0.5571}{6} \text{ X} 0.0928$$

$$\text{Standard deviation } (\pm_m \text{ X} \sqrt{\frac{[R_m \text{ Z} E(R_m)]^2}{n \text{ Z} 1}} \text{ X} \sqrt{\frac{0.6106}{6 \text{ Z} 1}} \text{ X} 0.3494$$

$$\text{Coefficient of variation (CV) } = \frac{\pm_m}{E(R_m)} \text{ X} \frac{0.3494}{0.0928} \text{ X} 3.7650$$

**4.5 Comparison of Sample Bank with Market.**

**4.5.1 Nepal Arab Bank Ltd (NABIL).**

**Table No: 4.17**

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

| Statistics | NABIL | Market |
|---|---|---|
| Expected Return, E(R) | 0.3186 | 0.0928 |
| Variance $(\pm^2)$ | 0.2768 | 0.1221 |
| Standard Deviation $(\pm)$ | 0.5261 | 0.3494 |
| Coefficient of variation (CV) | 1.6512 | 3.7650 |
| Systematic risk $(\ ^2\pm_m^2)$ | 0.2640 | - |
| Unsystematic risk $(e^2)$ | 0.0128 | - |
| Beta $(\ )$ =Index of systematic risk | 1.4713 | 1 |
| Alpha $(\sim)$ =Intercept | 0.1820 | - |
| Correlation with market $(°)$ | 0.9765 | - |
| Proportion of systematic risk $(°^2)$ | 0.9537 | - |
| Proportion of unsystematic risk $(1 \text{ Z } °^2)$ | 0.0463 | - |

Data Source: Table No: 4.3, 4.15 & Appendix 'I'

NABIL'S common stock's expected rate of return is higher than the market (0.3186>0.0928) which means NABIL'S stock return is 3.4331 times higher than the market return. This is due to that every year this bank is paying high dividend. NABIL'S common stock standard deviation is higher than the market standard deviation (i.e.0.5261>0.3494).

Coefficient of variation is better measure of risk because it measure risk per unit. CV of NABIL is less than CV of market (i.e.1.6512<3.7650) which means common stock of NABIL has less risk per unit return than the market.

Beta coefficient of NABIL is 1.4713 which is greater than the market. It means that NABIL is highly volatile than the market return. So, it is called aggressive asset.

The intercept is 0.1820; it shows that the NABIL'S return with market return is zero. Expected return of NABILis 18.20%; when the market earns nothing. If the yearly market return is expected to be 1%, expected yearly return of NABIL is

$$R = \sim \Gamma \mid E(R_m)$$

$$= 0.1820 \Gamma 1.4713 \mid 0.0928$$

$$= 0.3185 \text{ or } 31.85\%$$

The correlation with market is 0.9765. The positive correlation indicates that the market (NEPSE) return goes up, return of NABIL also goes up or vise versa. The coefficient of determination or proportion of systematic risk is 0.9537. It indicates the percentage of variance of NABIL'S. So, it is called the systematic (market) risk and therefore, it is undiversifiable

The [0.0463((1 Z ° $^2$) ] residual variance is specific risk of the firm. It is also called unsystematic risk and it is diversifiable.

### 4.5.2 Himalayan Bank Ltd (HBL).

**Table No: 4.18**

**Summary of Risk and Return of HBL and Market**.

| Statistics | HBL | Market |
|---|---|---|
| Expected Return, E(R) | 0.2563 | 0.0928 |
| Variance ($\pm^2$) | 0.2179 | 0.1221 |
| Standard Deviation ($\pm$) | 0.4668 | 0.3494 |
| Coefficient of variation (CV) | 1.8213 | 3.7650 |
| Systematic risk ( $^2\pm_m^2$) | 0.2033 | - |
| Unsystematic risk ($e^2$) | 0.0146 | - |
| Beta ( )=Index of systematic risk | 1.2909 | 1 |
| Alpha (~)=Intercept | 0.1366 | - |
| Correlation with market (°) | 0.9658 | - |
| Proportion of systematic risk (°$^2$) | 0.9329 | - |
| Proportion of unsystematic risk (1 Z °$^2$) | 0.0671 | - |

Data Source: Table No: 4.6, 4.15 & Appendix 'II'

HBL common stocks rate of return is higher than the market (0.2563> 0.0928) which means HBL stock return is 2.7618 times higher than the market return. This is due to that every year this bank is paying high dividend. HBL common stock standard deviation is higher than the market standard deviation (i.e.0.4668>0.3494).

Coefficient of variation is better measure of risk because it measures risk per unit. CV of HBL is less than the CV of market (i.e.1.8213<3.7650) which means common stock of HBL has less risk per unit return than the market return.

Beta coefficient of HBL is 1.2909 which is more than the market. It means that return of HBL bank is highly volatile than the market. So, it is called aggressive asset.

The intercept is 0.1366; it shows that the HBL'S return with market return is zero. Expected return of HBL is 13.66%, when the market earns nothing. If the yearly market return is expected to be 1%, expected yearly return of HBL is

R= ~ Γ ⏐ $E(R_m)$

= 0.1366+1.2909 ⏐ 0.0928

=0.2563 or 25.63%

The correlation with market is 0.9658. The positive correlation indicates that the market return goes up; return of HBL bank also goes up or vice versa.

The coefficient of determination or proportion of systematic risk is 0.9329. It indicates that the percentage of the variance of HBL'S return explained by the change in the market returns. Thus, 93.29 percent risk of HBL bank is explained by the market. It is known as systematic risk and therefore, it cannot be diversified.

The 6.71 percent (1- ° $^2$) residual variance is specific risk of the firm. It is called unsystematic risk and it is diversifiable.

### 4.5.3 Nepal Everest Bank Ltd (EBL)

**Table No: 4.19**

**Summary of Risk and Return of EBL & Market**.

| Statistics | EBL | Market |
|---|---|---|
| Expected Return(R) | 0.4787 | 0.0928 |
| Variance ($\pm^2$) | 0.3622 | 0.1221 |
| Standard Deviation ($\pm$) | 0.6019 | 0.3494 |
| Coefficient of variation (CV) | 1.2573 | 3.7650 |
| Systematic risk ( $^2\pm^2_m$) | 0.3356 | - |
| Unsystematic risk ($e^2$) | 0.0266 | - |
| Beta ( ) = Index of systematic risk | 1.6586 | 1 |
| Alpha (~ ) =Intercept | 0.3247 | - |
| Correlation with market | 0.9625 | - |
| -Proportion of systematic risk ($°^2$) | 0.9265 | - |
| Proportion of unsystematic risk | 0.0735 | - |

Data Source: Table No: 4.9, 4.15&Appendix 'III'.

EBL'S common stocks expected rate of return is higher than the market (0.4787>0.0928) which means EBL'S stock return is 5.1584 times higher than the market return. This is due to that every year this bank is paying high dividend. HBL'S common stock standard deviation is higher than the market standard deviation (i.e.0.6019>0.3494).

Coefficient of variation is better measures of risk because it measure risk per unit. CV of EBL is less than the CV of market (i.e.1.2573< 3.7650) which means common stock of EBL has less risk per unit return than the market return.

Beta coefficient of EBL is 1.6586 which is more than the market. It means that the return of EBL bank is highly volatile than the market return. So, it is called aggressive asset.

The intercept is 0.3247; it shows that the EBL'S return with market return is zero. Expected return of EBL is 32.47%, when the market earns nothing. If the yearly market return is expected to be 1%, expected yearly return of EBL is

$$R = \sim \Gamma \mid E(R_m)$$

$$= 0.3247 \Gamma 1.6586 \mid 0.0928$$

$$= 0.4786 \text{ or } 47.86\%$$

The correlation with market is 0.9625. The positive correlation indicates that the market return goes up; return of EBL also goes up or vice versa. The coefficient of determination or proportion of systematic risk is 0.9265. It indicates the percentage of variance of EBL .So, it is called the systematic (market risk) and therefore, it is undiversifiable.

The 0.0735 (1- $\circ^2$) residual variance is specific risk of the firm. It is called unsystematic risk and it is diversifiable.

**Table No: 4.20**
**Summary of Risk and Return of Sample Banks**.

| Statistics | NABIL | HBL | EBL |
|---|---|---|---|
| E(R) | 0.3186 | 0.2563 | 0.4787 |
| $\pm^2$ | 0.2768 | 0.2179 | 0.3622 |
| $\pm$ | 0.5261 | 0.4668 | 0.6019 |
| CV | 1.6512 | 1.8213 | 1.2573 |
| $^2\pm^2_m$ | 0.2640 | 0.2033 | 0.3356 |
| $e^2$ | 0.0128 | 0.0146 | 0.0266 |
| | 1.4713 | 1.2909 | 1.6586 |
| $\sim$ | 0.1820 | 0.1366 | 0.3247 |
| $\circ$ | 0.9765 | 0.9658 | 0.9625 |
| $\circ^2$ | 0.9537 | 0.9329 | 0.9265 |
| 1- $\circ^2$ | 0.0463 | 0.0671 | 0.0735 |

Data Source: Table No: 4.11 and Appendix I to III.

## 4.6 Price Evaluation of Selected Banks.

CAPM is a model that assumes stocks required rate of return is equal to the risk free rate plus its risk premium. Where risk premium is measured by the beta coefficient. Beta coefficient plays a vital role in CAPM approach. If the required rate of return is less than expected rate of return then the stock is said to be under priced and if the required rate of return is more than the expected rate of return then the stock is said to be overpriced.

For this analysis, risk free rate is measured which is taken from the interest rate of Treasury bill issued by Nepal Rastra Bank.

**Table No: 21**

**Calculation of Required Rate of Return and Price Evaluation by CAPM Model.**

| Banks | Beta | $E(R_i)\,X R_f\ \Gamma[E(R_m)\,Z R_f\ ]_i$ | E(R) | Price Situation |
|---|---|---|---|---|
| NABIL | 1.4713 | 0.1098 | 0.3186 | Under Priced |
| HBL | 1.2909 | 0.1033 | 0.2563 | Under Priced |
| EBL | 1.6586 | 0.1166 | 0.4787 | Under Priced |

Where,

E(R) = Expected rate of return (from table no: 4.20).

$R_f$ =Risk Free Rate of Return (0.0566).

$E(R_{m)}$ =Market Rate of Return (0.0928).

= Beta of Individual Sample Banks. (From table No: 4.20)

All the stocks of commercial bank are under priced because the required rate of return is less than the expected rate of return. So, the investors can gain by buying the stocks. Their stocks value will increase in the near future by providing the investors higher return. So, the investors should buy these stocks and who are holding shouldn't sell.

**4.7 Correlation between Banks.**

The correlation coefficient always lies between +1 & -1. It is also a measure of the relationship between two assets. Returns of securities are very perfectly together when the correlation coefficient is +1 and is perfectly opposite directing when it is -1. A zero correlation coefficient implies that there is no relationship between the return of securities. Correlation between the returns of the two securities plays a significant role in risk reduction by portfolio construction.

**Table No: 22**

**Correlation Matrix**

| Sample | NABIL | HBL | EBL |
|---|---|---|---|
| NABIL | 1 | 0.9087 | 0.9722 |
| HBL | - | 1 | - |
| EBL | - | 0.9035 | 1 |

Above table shows that correlation between sample bank's stocks. If the correlation between stocks is +1, any part of the risk cannot be reduced by diversification. On the other hand, if correlation between stocks is -1, the proper combination of two stocks can reduces all the risk. So, in conclusion it can be said that as long as correlation between securities return is negative, construction of portfolio is beneficial.

# CHAPTER -5

## Findings, Conclusion, and Recommendation.

### 5.1 SUMMARY

Investor generally invests their cash only to those areas where there is high return and low risk. This study occupies an important role in the development of stock market.

Lack of information and proper knowledge is chief problem faced by an individual investor who are manipulated by the market intermediaries. Investors invest their wealth on the basis of guess and hunches because they do not have any information about the financial assets and there is also the lack of idea to reach the ideal information. Investor purchase stocks merely looking past trend of stock prices and sometimes they have to bear heavy loss due to inadequate information and knowledge related to the stock investment. One expects favorable reruns by holding stock. How can one make higher return assuming lower risk?

The main objective of the study is to analyze the risk and return of common stocks in Nepalese context. The study is focused on the common stock of listed commercial banks. Thus, listed three commercial banks are taken as sample to analyze the risk and return on common stock investment. While analyzing the risk and return, brief review of related studies has been performed. This analysis of risk and return is a significant in investment decision as well as managerial decision. It influences risk and return of the shareholders. Consequently the risk and return analysis influences the market price of stock. So, before making an investment decision, a person must analyze the risk and return of a particular stock as well as they can make a good risk minimizing portfolio between their investments in the stock.

However, different scholars have suggested various statistical as well as financial tools like required rate of return, expected rate of return, standard deviation, variance, coefficient of variation, beta coefficient, correlation coefficient, coefficient of determination, portfolio return and risk, least square regression equation and so on. Different diagrams, tables, graph are used to present the result. All the data are collected from the secondary sources. Secondary sources of data are NEPSE, AGM report of various banks, trading report of SEBO, website etc. Findings of analysis are summarized and conclusions are outlined below.

## 5.2 FINDINGS OF THE STUDY:

It is very important part of the study. All people, investors, bankers, researchers and other who are related with the investment of common stock may gain advantage from the findings of this study. From the analysis of this study the major result on risk and return on common stock investment in Nepalese commercial banks are summarized below.

# Expected return on the common stock of EBL is highest among all the sample banks (i.e. 0.4787) and the lowest among all is HBL (i.e. 0.2563).

# Standard deviation is only the way to measure the systematic risk, which is not defined by the market and is measured by the beta coefficient. On the basis of S.D, Common Stock of EBL is more risky. Since, it has high standard deviation (i.e. 0.6019) and common stock of HBL is less risky because it has lowest standard deviation (i.e. 0.4668).

# Most of the investors invest only keeping the return in the mind but they are found unable to calculate the risk factor of the security. Most of the Nepalese private investors invest in single security. Some of the investors use their funds in two or more securities. But it is found that they don't make analysis of portfolio before

selecting security. They invest their fund in different securities on the basis of expectation and assumption of individual securities rather than analysis of the effect of portfolio. It seems that they don't have the knowledge of risk diversification by using portfolio of their investment.

# Coefficient of variation is more rational and the best way of investment decision because it measure the risk per unit of return. On the basis of C.V, common stock of EBL has lower C.V. It has 1.2573 unit of risk per unit of return. And the common stock of HBL can be considered as more risky because it has higher C.V (i.e. 1.8213) among all the selected banks.

# Beta coefficient measures the systematic risk and explains the sensitivity or volatility of stock with market. In this context, common stock of all the selected banks is greater than market beta.

# Alpha is the intercept, where the characteristics line intercepts the vertical axis. It measures the $i^{th}$ assets rate of return when the market return $r_m$=0.EBL has 32.47% alpha which is higher alpha among sample banks and the common stock of HBL has lower alpha i.e. 13.66%. On the basis of alpha analysis common stock of all sample banks have positive alpha value.

# Correlation is also a measure of the relationship between two assets. Its values are limited between the range of +1 and -1. All the sample banks have positive correlation with market. The positive correlation indicates that when market returns goes up, return on common stock of sample banks also goes up and vice-versa. Correlation coefficient of NABIL is higher (i.e.0.9765) while correlation coefficient of EBL is lower (i.e. 0.9625).

# Common stock of NABIL has higher coefficient of determination or proportion of systematic risk (i.e. 95.37 %/) which cannot be minimized through diversification where as common stock of EBL has lower proportion of systematic risk (i.e. 92.65%).

# Lower the coefficient of determination means higher the proportion of unsystematic risk. Common stock of EBL has higher diversification risk (i.e. 7.35%) and the common stock of NABIL has lower diversifiable risk (i.e.4.63%). Unsystematic risk can be avoided through diversification. From the above analysis, investors are recommended to purchase those stocks which have high expected return with low proportion of undiversification risk to make portfolio investment.

#Unsystematic risk can reduce by making a portfolio of individual security significantly. If investors select the securities for investment which have highly negative correlation of returns, the risk can be reduced totally. If the correlation between the return of two securities is highly positive, risk cannot be reduce. So, significantly in this research work all the sample banks have positive correlation among their returns.

# Capital assets pricing model describes the relationship between assets return and its systematic risk. We can identify whether the stock is overpriced or under priced by comparing expected rate of return and required rate of return. If the required rate of return is lower than the expected rate of return, than the stock is known as under priced and if the required rate of return is more than the expected rate of return, the stock is overpriced. This study shows that all the stocks of sample banks are under priced.

## 5.3 RECOMMENDATION AND SUGGESTIONS

Common stock is most risky security among all the marketable securities. Therefore, the investor must have proper knowledge and information while taking an investment decision. Before making an investment decision in stock market, the investors should analyze the market situation carefully by analyzing their own risk return attitude, needs and requirements. Several discussions with stock broker should be done and the decision should be taken on the basis of reliable information rather than rumor and imagination.

# Since the return of EBL for given sample period is the highest. So, those investors could be more benefited if they invest in the common stock of EBL. By the sametime, the risk of EBL is also maximum which is consistent with risk and return theory.

# According to this study, the sample banks have higher return than the market return. And under CAPM approach, stocks of all sample banks are under priced. From this angle, the investors are suggested to purchase these stocks and the investors those who are holding these stocks should not sell.

# If the investor is risk averter then he/she should choose the stock of HBL. And if the investor is risk seeker then he/she should choose the stock of EBL.

# To assess profitable investment, it is better to measure the coefficient of variation because it is a measure of relative dispersion. It measure the risk per unit of return and more useful than absolute one i.e. S.D. of a given security.

However, this study is done under certain limitation both methodological as well as scope limitation, further research in this field will give more information to

the investors, market makers and corporate for further study. Some recommendations are outlined.

# Risk and return analysis is completely untouched area in Nepalese context. It is strongly suggested that future study should be done/conducted on this topic and research should include maximum number of sample of long period data.

# It is recommended to use latest risk and return analysis tools and techniques.

# Risk and Return should be based on optimal portfolio.

# Analysis of personal risk, attitude and requirement will be helpful before making an investment decision in stock market. Investors should make several discussions with stock broker before reaching at the final decision. Investors should not invest only in imagination and rumors.

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# APPENDICES

## Appendix-I

**Calculation of beta ( ) coefficient and other values of NABIL.**

| FY | [R-E(R)] | $[R_m - E(R_m)]$ | $(R - E(R))(R_m - E(R_m))$ |
|---|---|---|---|
| 1999/00 | 0.7599 | 0.57 | 0.4331 |
| 2000/01 | -0.0874 | -0.1268 | 0.0110 |
| 2001/02 | -0.8086 | -0.4397 | 0.3555 |
| 2002/03 | -0.2506 | -0.1927 | 0.0482 |
| 2003/04 | 0.1303 | -0.0087 | -0.0011 |
| 2004/05 | 0.2564 | 0.1982 | 0.0508 |
| **Total** | | | **0.8975** |

Data Source: Table No: 4.3 &4.15

We have,

$$\text{Cov}(R, R_m) = \frac{(R - E(R))(R_m - E(R_m))}{n - 1} \times \frac{0.8975}{6 - 1} \times 0.1795$$

$$\text{Beta Coefficient } (\beta) \times \frac{Cov(R, R_m)}{\sigma_m^2} \times \frac{0.1795}{(0.3494)^2} \times 1.4959$$

Calculation of alpha $(\alpha)$ intercept

We have,

Expected return of NABIL, E(R) = 0.3186

Expected return of market, E(R) =0.0928

Now,

$$\alpha = E(R) - \beta \mid E(R_m)$$

$$= 0.3186 - 1.4713 \mid 0.0928$$

$$= 0.1820$$

**Calculation of systematic risk and unsystematic risk**

We have,

Variance or Total risk of NABIL $(\pm^2) = 0.2768$

Variance of market $\pm^2_m = 0.1220$

Total risk =Systematic risk +Unsystematic risk

$\pm X \quad ^2\pm^2_m \Gamma e^2$

Systematic risk = $\quad ^2\pm^2_m X(1.4713)^2 \mid 0.1220 X 0.2640$

Unsystematic risk = Total risk –Systematic risk

$= 0.2768\text{-}0.2640 \quad = 0.0128$

**<u>Partitioning of Total Risk</u>**

**Coefficient of determination or proportion of systematic risk**

$$(\circ^2) X \frac{Systematic \quad Risk}{Total \quad Risk} X \frac{0.2640}{0.2768} X\ 0.9537 \text{Or } 95.37\%$$

Proportion of unsystematic risk $(1\text{-} \circ^2) X\ 1\text{-}0.9537 = 0.0463$ or 4.63%

Correlation with market $(\circ) X \sqrt{0.9537} = 0.9765$

## Appendix-II

**Calculation of Beta ( ) coefficient and other values of HBL.**

| FY | [R-E(R)] | $[R_m \; Z E(R_m)]$ | $\bullet R \; Z E(R)' \bullet R_m \; Z E(R_m)'$ |
|---|---|---|---|
| 1999/00 | 0.8687 | 0.57 | 0.4951 |
| 2000/01 | -0.2108 | -0.1268 | 0.0267 |
| 2001/02 | -0.4057 | -0.4397 | 0.1783 |
| 2002/03 | -0.3349 | -0.1927 | 0.0645 |
| 2003/04 | -0.0315 | -0.0087 | 0.0002 |
| 2004/05 | 0.1146 | 0.1982 | 0.0227 |
| **Total** | | | **0.7875** |

Data Source: Table No: 4.6 &4.15

We have,

$$\text{Cov}\ (R, R_m)\ \text{X}\frac{[R\ \text{Z}E(R)]\quad [R_m\ \text{Z}E(R_m)]}{n\ \text{Z}1}\ \text{X}\frac{0.7875}{6\ \text{Z}1}\ \text{X}0.1575$$

$$\text{Beta Coefficient}\ (\quad)\ \text{X}\frac{Cov(R, R_m)}{\pm\ {}^{2}_{m}}\ \text{X}\frac{0.1575}{0.1220}\ \text{X}1.2909$$

**Calculation of alpha (~) intercept.**

We have,

Expected rate of return of HBL, E(R) = 0.2563

Expected rate of return of market(R) = 0.0928

Now,

$$\sim\ \text{X}E(R)\ \text{Z}\quad |\ E(R_m)$$

$$=0.2563\ \text{Z}1.2909\ |\ 0.0928\ \text{X}0.1366$$

**Calculation of systematic and unsystematic risk.**

We have,

Variance or Total risk of HBL ($\pm^2$) =0.2179

Variance of market ($\pm^2_m$) =0.1220

Total risk =Systematic risk +Unsystematic risk

$\pm^2$ X $^2\pm^2_m \Gamma e^2$

Now,

Systematic risk = $^2\pm^2_m$ X$(1.2909)^2$ | 0.1220 X0.2033

…Unsystematic risk =Total risk- Systematic risk

=0.2179-0.2033 =0.0146

**Partitioning of Total Risk**

Coefficient of determination or proportion of systematic risk

$\circ^2$ X$\frac{Systematic \quad Risk}{Total \quad Risk}$

$= \frac{0.2033}{0.2179}$ X0.9329 or 93.29%

Proportion of Unsystematic Risk = 1- $\circ^2$

=1-0.9329 =0.0671 or 6.71%

Correlation with market ($\circ$) X$\sqrt{0.9329}$ X0.9658

## Appendix-III

**Calculation of Beta ( ) coefficient and other values of EBL.**

| Fiscal Year | [R-E(R)] | $[R_m \; Z E(R_m)]$ | [R-E(R)] $[R_m \; Z E(R_m)]$ |
|---|---|---|---|
| 1999/00 | 0.9291 | 0.57 | 0.5295 |
| | | -0.1268 | 0.0348 |
| | -0.2747 | -0.4397 | 0.3980 |
| 2000/01 | -0.9053 | - 0.1937 | 0.0095 |
| 2001/02 | -0.0494 | -0.0087 | -0.0008 |
| | 0.0943 | 0.1982 | 0.0408 |
| 2002/03 | 0.2063 | | |
| 2003/04 | | | |
| 2004/05 | | | |
| **Total** | | | **1.0118** |

Data Source: Table No: 4.9 &4.15

We have,

$$\text{Cov}(R, R_m) = \sqrt{\frac{\bullet R \; Z E(R)' \bullet R_m \; Z E(R_m)'}{n \; Z 1}} \; X \frac{1.0118}{6 \; Z 1} \; X 0.2023$$

$$\text{Beta Coefficient} ( \; ) \; X \frac{Cov(R, R_m)}{\pm \; {}^{2}_{m}} \; X \frac{0.2023}{0.1220} \; X 1.6586$$

Calculation of alpha $(\sim)$ intercept

We have,

Expected return of EBL, E(R) =0.4787

Expected return of market, E(R) =0.0928

Now,

$\sim \; X E(R) \; Z \quad | E(R_m)$

$X 0.4787 \; Z 1.6586 \; | \; 0.0928 \; X 0.3247$

**Calculation of systematic and unsystematic risk**

Variance or Total risk of EBL ( $(\pm^2)$ =0.3622

Variance of market $(\pm_m^2)$ =0.1220

We have,

Total risk =Systematic risk +Unsystematic risk

$\pm^2 \text{ X } {}^2\pm_m^2 \Gamma e^2$

Systematic risk = ${}^2\pm_m^2 \text{ X} 2.7509 \mid 0.1220 \text{ X} 0.3356$

Unsystematic risk =Total risk –Systematic risk

=0.3622-0.3356 = 0.0266

**Partitioning of Total Risk**

**Coefficient of determination or proportion of systematic risk**

$$\circ^2 \text{ X} \frac{Systematic \quad risk}{Total \quad Risk} \text{ X} \frac{0.3356}{0.3622} \text{ X} 0.9265 or \quad 92.65\%$$

Proportion of unsystematic risk= 1- $\circ^2$

=1-0.9265

=0.0735 or 7.35%

Correlation with market ( $\circ$ ) = $\sqrt{0.9265}$ =0.9625