# RISK AND RETURN ANALYSIS ON COMMON STOCK INVESTMENT OF LISTED COMMERCIAL BANKS IN NEPAL

**(WITH SPECIAL REFFERENCE TO FIVE LISTED COMMERCIAL BANKS)**


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# RECOMMENDATION

**This is to certify that the thesis**
**Submitted by**
**Paramanand Prasad Yadav**
**Entitled**

**"RISK AND RETURN ANALYSIS ON COMMON STOCK INVESTMENT OF LISTED COMMERCIAL BANKS IN NEPAL"**

**(With reference to five listed commercial banks)**

Has been prepared as approved by this deparment in the prescribed format of the faculty of Management.This thesis is forwarded for evaluation.

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| Rambabu Prasad Chaurasiya | Shambhu Prasad Chaurasiya |
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# VIVA-VOCE SHEET

**We have conducted the viva-voce examination of the thesis**

**Presented by**

**Paramanand Prasad Yadav**

## *Entitled*

**"RISK AND RETURN ANALYSIS ON COMMON STOCK INVESTMENT OF LISTED COMMERCIAL BANKS IN NEPAL"**

**(With reference to five listed commercial banks)**

And found the thesis to be original work of the student and written according to the prescribed format. We recommend the thesis to be accepted as fulfillment of the requirement of the Master's Degree in Business Studies (MBS).

## Viva-Voce Committee

Head of Research committee):- ----------
Member (Thesis Supervisor):- ----------
Member (External Expert):- ----------

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# DECLARATION

I hereby declare that the work reported in this thesis entitled "RISK AND RETURN ANALYSIS ON COMMON STOCK INVESTMENT OF LISTED COMMERCIAL BANKS IN NEPAL" (With reference to five listed commercial banks) a comparative study of (NABIL, NIBL, SCBL, HBL and BOKL) submitted to the office of the dean, faculty of management, T.U. is my original work done in the form of partial fulfillment of the requirements for the degree of Master of Business Studies (M.B.S.) under the supervison of Mr Rambabu Chaurashia , a Lecture of Hari Khetan Multiple Campus.

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It is extremely gratifying to examine the risk and return on common stock investment of commercial banks its impact on the investors. This research paper is designed to highlight the methods of analyzing risk and return factors on common stock investment in the present situation. Five listed commercial banks are selected as the representative enterprises to evaluate common stock and have been compared the risk return of these banks to market. During the course of my study, I found myself fortunate enough to receive a great deal of help and pursuance from various persons and institution. I express my humble gratitude to all of them.

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I have tried to make this report relevant and avoid mistakes. However, I would like to apologize for any mistakes revealed.

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**ABBREVIATION**

| | |
|---|---|
| **AGM** | - Annual General Meeting |
| **APT** | - Arbitrage Pricing Theory |
| **BOKL** | - Bankof Kathmandu Limited |
| **C.S.** | - Common Stock |
| **C.V** | - Cofficient of Variation |
| **CAPM** | - Capital Assets Pricing Model |
| **CML** | - Capital Market Line |
| **D.F.** | - Degree of Freedom |
| **D.P.S.** | - Dividend Per Share |
| **e.g.** | - For Example |
| **E.P.S.** | - Earning Per Share |
| **E.R.R.** | - Exted Rate of Return |
| **et.al.** | - and others |
| **F/S** | - Fiscal Year |
| **HMG/N** | - His Magesty's Government of Nepal |
| **i.e.** | - that is |
| **ibid** | - from the same place |
| **Ltd.** | - Limited |
| **M.P.S.** | - Market Price Per Share |
| **NABIL** | - Nepal Arab Bank Limited |
| **NBBL** | - Nepal Bangladesh Bank Limited |
| **NEPSE** | - Nepal Stock Exchange Limited |
| **NIBL** | - Nepal Investment Bank Limited |
| **No.** | - Number |
| **NRB** | - Nepal Rastra Bank |
| **Pvt.** | - Private |
| **R.R.R.** | - Required Rate of Return |
| **Rf** | - Risk Free Rate |
| **Rs.** | - Rupees |
| **S.N.** | - Serial Number |
| **S.D.** | - Standard Deviation |
| **SEBO/N** | - Security Board of Nepal |
| **SML** | - Security Market Line |
| **SR** | - Systematic Risk Factor |
| **T.U.** | - Tribhuvan University |
| **USR** | - Unsystematic Risk Factor |
| **Vol,** | - Volume |

# CHAPTER-1

# INTRODUCTION

## 1.1 Background

The business world is entirely different from the one in the past. The changing life style has always been challenging to the business community and has given opportunity to produce thousand types of goods and services to satisfy the changing needs of people. Markets for products and services have developed throughout the world and the competition among firms had altered their managers to forecast the future preference of society. All this has induced business to gear up investment in many fields where investment needs huge amount of money, which cannot be covered by the firms past profits and surplus of individual investors only but they need large no. of investors which can be through common stock financing.

Today each and every managerial decision making is based on financial analysis. It covers the acquisition, utilizations, control and administration of funds. Virtually all individuals and organizations earn or raise money and invest money. The finance is concerned with the conversion of capital funds to meet the finance needs of business organizations. In a short period, the field of finance has developed considerably. Securities raise funds in capital market that certainly help to expand the nation economy. The concept of banking system was introduced in Nepal with the establishment of Nepal bank limited in 1973. The financial scenario has changed with the establishment of joint venture banks in 1984. The number of commercial banks has been increasing and so in the investment volume and opportunity in various sectors that extends to agriculture, industry, commercial and social sectors. There are many commercial banks are operating in Nepal, among them some are listed in Nepal stock exchange, which claims the highest contribution on the market capitalization in compare to another sectors and these are also found better in terms of Earning per Share (EPS).

Security market exits in order to bring together buyers and sellers of securities, meaning their mechanism are created to facilitate the exchange of financial assets. Stock

market, which probably has the greatest glamour and is perhaps the least understood. Lord Keynes was 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 those who treat it as game to be played not for profit but also for enjoyment and sports. Stock market provides both opportunities and threats. Opportunities for the well informed people having better knowledge of market realities and threats for the unknown people.

In Nepalese context, the institutional set up of securities market began along with the "Securities Exchange Centre" (now Nepal Stock Exchange Limited) in 1976 A.D. Through after considerable development, there still exists some problem in the development of stock markets in Nepal. Most of the shareholder and investors are least familiar with risk and return behaviors of stock.

The concept of risk and return are the determinant for the valuation of securities. However, risk means that we don't know what is going to happen even through 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 changes 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 assets. Return is the income received in investment. People invest their belongings with an expectation of getting some reward for leaving its liquidity. They only invest in those opportunities where they can get higher return. Hence investor wants favorable return to be yield by its stock and go for those which yield more.

A stock reflects the uncertainty about future return, such that the actual return may be less than expected return. The main sources of uncertainty are the prices at which the stock will be sold. Dividends tend to be much more stable than stock prices which contribute to the immediate return received by investors and at the same time reduce the amount of earnings reinvested by the firm which limits its potential growth. And stock prices can be affected by economics factors such as interest rates, economic growth inflation, and the strength of the dollars. They can also be affected by micro economic factors such as specific policies enacted by a particular firm that will affect future

earnings. The risk of stock can be measured by its price volatility, its beta and by the value of risk analysis methods.

## 1.2 Statement of the problem

After the economic liberalization and globalization policies adopted by the Nepalese government, large number of public limited companies is being established for providing banking services, insurance service, participating in development works, manufacturing companies, processing and others. The opportunities are limited where as such institution are mushrooming and competing themselves intensively. After the emergence of NEPSE, the concept of capital market has been developed and has been growing rapidly in short span of time.

Due to lack of information and poor knowledge, individual investors are manipulated or exploited by the financial institution or other market intermediaries to such an extent that investing in common stock is intolerably hazardous. Investor's attitude and perception plays a great role in rational decision, which is influenced by the knowledge and access to the date required for analysis. But not only general public but also university graduates and post graduates feel difficulty in analyzing the risk and return while making stock investment decision.

At the same there is no any separate institution which provides information required to rational decision that can accelerate the stock investment and market efficiency. Government policy is less encouraging in promoting common stock investment. The Nepalese stock market is characterized by a low trading volume, absence of professional brokers, early stage of growth, limited movement of share prices and limited information available to investors. The number of investors in stock market is still very view, who are not confident to get appropriate returns from the listed companies. People assume more risk in stock investment than its real risk. To boost confidence analysis in the field is a must. Unavailability of clear and simple technique to analyze risk associated with returns is also a constraint. It denotes that many investors should be well aware of degree of risk in which they are going to make investments of their saving funds.

There are very few practices of analyzing this aspect in Nepalese context. Most of the investors seem to be investing their funds haphazardly without considering risk involved in their investment.

Further theory says that a stock prices in the market is guided by the intrinsic values which is calculated by add of companies result of financial performance such as dividend, required rate of return and growth rate. In an efficient market condition, stock prices are equal to the intrinsic values since the buyers and sellers are fully aware of facts and figures of the companies. Therefore, one can say that the market price and financial performance are positively correlated but condition here is totally different from that. Since the theories has depicted is not applicable in our context, where more of the investors don't know to interpret the information and so they can't make a rational decision regarding transaction of the stocks. Therefore, the sock prices in Nepal are determined by more the other factors rather than the financial performance of the concerned companies.

For instance we can take the case of Nepal industrial and commercial Bank as a latest example which issued shares at par and within six month period the share prices has risen to more than two hundred percent that is not only rare but virtually impossible in an efficient market condition.

Therefore, it needs courage and at the same time faith to investing common stocks. In most of the time which can be generated through proper evaluation with giving view to the prevailing market atmosphere, but how can relay on these stock, what are the criteria for the evaluation that the stock they are holding will give them a favorable return, What should be the compensation they have to receive for bearing a risk, How do they know about the magnitude of risk, How can one make higher return through lower risk. These are the burning issues that have influenced the researcher to carry out this study.

## 1.3 Objectives of the study

The basic objectives of this study is to assess the risk associated with return on common stock investment of the listed commercial banks on the basis of selective financial as well as statistical tools.

The specific objectives of this study are as follows:-

a. To evaluate common stocks of listed commercial banks in terms of risk and return and to perform sector wise comparison on the basis of market capitalization.
b. To assess the risk compensating return of commercial banks and its position in stock exchange.
c. To analyze the volatility of common stocks and other relevant variables as an affecting factors in portfolio construction of common stocks.
d. To identify the correlation between return of each commercial banks.
e. To suggest to optimal portfolio of sample Banks.
f. To make relevant suggestions and practical ideas on the basis of findings.

## 1.4 Significance of study

Mostly the public companies obtain funds from the public investors through financial market stock. The long run objectives of every company are to maximize share holder wealth position where as the investors seeks to get good returns in future.

In Nepalese context, there is lacks wider investment opportunities which provides good rate of return. So there has been huge amount of unutilized saving funds with general publics. Increasing trends of MPS of public companies, mainly joint ventures commercial banks attract the investors. Therefore they are investing their saving funds in common stocks of public companies with a good expectation of higher capital gain in future. But there seems very least consciousness about the real financial condition of the companies and degree of risk involved in their investment.

This research has attempted to analyze the MPS of sample companies with reference to their financial indicators and risk in common stock investment, which may probably provide real pictures of sample companies to both the outstanding and potential investors in order to take proper investment decision. Similarly, this piece of task may work as guide for future researcher and concerned persons.

Further, this research will attempt to clarify concrete pictures of different aspect of risk and return, which will be beneficial to the investors for taking right investment decision.

## 1.5 Limitation of the study

The limitations of the study are as follows;

a. The study is based on five commercial banks listed in NEPSE.
b. The five years data are analyzed.
c. The study is done on the basis of availability secondary data and information so the consistency of findings and conclusion is totally depending upon the reliability of secondary data and information.
d. The study cannot cover all the dimension of the subject matter due to the limited time period.
e. The study only focus the analysis of risk and return associated with common stock investment of selected companies.

## 1.6 Organization of the study

This study has been broadly divided into five chapters which are as follows;

1) Chapter I: Introduction.
   It includes general introduction, statement of the problem, objectives of the study, significance of the study, limitations of the study and organization of the study.
2) Chapter II: Review of Literature.
   It consists of the review of concept and previous various studies relevant to this study.
3) Chapter III: Research Methodology.
   It focuses on the research design, population and sample, source of data, data gathering procedure and tools etc.
4) Chapter IV: Data presentation and analysis.
   This chapter attempt to analyze and evaluate the data with the help of financial as well as statistical tools and interprets the result so obtained.

5) Chapter V: Summary conclusion and recommendation.
It sums up the results obtained through analysis and recommends some suggestions.

# CHAPTER- 2

## REVIEW OF LITERATURE

This chapter deals with the theoretical aspect of the topic “Risk and Return on Common Stock Investment” in more detail and descriptive manner. Review of literature means reviewing research studies or either relevant proposition in the related area of the

study so that all the past studies, their conclusions and deficiencies may be known and further research can be conducted. It is an integral and mandatory process in research works. (Joshi, P.R., 2002, page-111)

For this study, some academic course books, journals, articles, relevant studies and the related thesis has been reviewed. In additional, independent studies carried out by well-known Nepalese financial experts are also taken into consideration.

The total study has been divided into two sections. Section first deals with the conceptual framework and section second deals with the review of previous studies in the same area.

## 2.1 Conceptual Framework

There are various books regarding risk and return, which are taken into consideration. Major focus of finance is trade off between risk and return. Here main focus in its implication in the investment of common stock.

### 2.1.1 Common Stock

The study is focused on common stock investment. Therefore light is thrown on it. Common stock represents an ownership position in a corporation. It is a residual claim, in the sense that creditors and preferred shareholders must be paid before common stockholder. In bankruptcy, common stockholder are in the principal entitled to any value remaining after all other claimants have been satiesfied[2]. Thus risk is highest with common stock and so must be in its expected return. When investor buys common stock, they receive certificate of ownership as a proof of there being part of the company. The certificate states the number of share purchased and their par value.

Common stock holders of a corporation are its residual owners, their claim to income and assets comes after creditors and preferred stockholders have been paid full. As a result, stockholder return on investment is less certain than the return to lender or to preferred stockholders. On the other hand; the share of a common stock can be authorized

either with or without par value. The par value of a stock is merely a stated figure in the corporate charter and is of little economic significance. (James C. Van Horne, 1997, p-560)

The great advantage of the corporate form of organization is the limited liabilities of its owners. Common stocks are generally "fully paid and non assessable, meaning that common stockholders may lose their initial investment, not more. That is, if the corporation fails to meet its objectives, the stockholders cannot be forced to give the corporation the funds that are needed to payoff the obligations. However, as a result of such a failure, it is possible that the value of corporation's shares will be negligible. This will result in the shareholder's is having listed an amount equal to the price previously paid to the buy the shares.

A corporation exists only when it has been granted a charter, or certificate of incorporation, by a state. This document specifies a right and obligation of stockholders. If may be amended with the approval of the stockholders, perhaps by a majority or a two – third vote , where each share of stock generally entitles its owner to one vote, Both the initial terms of charter and term of any amendment must also be approved by the state in which the corporation in chartered. (William F. Sharpe, Gordon J. Alexander and Jaffery V. Bailey, 1999, p-502)

The main features of common stocks are discussed below;

## (i) Stock Certificate

A single certificate has typically represented the ownership of a firm's with a number of shares held by a particular investor noted on it. Such a stock certificate is usually registered, with the name, address and the holding of the investor included on the corporation books.

## (ii) Ownership Right

Common stockholders are owner of the firm; they often have voting right that permit them to select firm's director and to vote on special issue. In contrast, debt holders may receive voting privilege only when the firm has violated the condition of a term loan agreement or bond indenture.

## (iii) Claims on Income and Assets

The claims of stockholders receive claims on both income and assets that are secondary to the claims of creditors.

## (A) Claims on Income

The claims of stockholders on income cannot be paid until the claims of all creditors have been satisfied. These claims include both interest and scheduled principal payments. Once these claims have been satisfied, the firm's board of directors can decide whether to distribute dividend to the owners. The firm's ability to pay dividends may be limited by legal, contractual and or internal constraints.

## (B) Claims on Assets

The claims of stockholders on the firm's assets are secondary to the claims of creditors. When the firm becomes bankrupt, assets are sold and the proceeds are distributed in this order;

a. To employees and customers.
b. To the government.
c. To the secured creditors.
d. To the unsecured creditors.
e. To the stockholders.

## (iv) Maturity

Common stock is a permanent form of financing. It does not mature and therefore repayment of the initial amount paid in it not required. Since common stock does not mature and will be liquidated only during bankruptcy proceedings. The owner must recognize that although a ready market may exist for the firm's shares, the price that

can be realized may fluctuates. This potential fluctuation of the market price of equity makes the overall return to a firm overall return to a firm's owner even more risky.

### (V) Tax treatment

Interest payments to the date holders are treated as tax – deductible expenses on the firms income statement, whereas divided payments to the common stockholders are non tax-deductible. The Tax-deductibility of interest primarily accounts for the fact that the explicit cost of debt is generally less than the explicit cost of equity.

Thus stockholders are the last to receive any distribution of assets during bankruptcy proceedings.

## 2.1.2 Common Stock Fundamentals

The true owners of business firms are the common stock holders, who invest their money in the firm because of their expectation of future returns. A common stockholder is sometimes referred to as a residual owner, since in essence she or he receives what is left after all other claims on the firm's income and assets have been satisfied.

Here, the fundamental aspects of common stocks are as follows;

### (i) Control

Common stock has voting right that can be used to elect corporate directors, who in turn, appoint the corporate officers. Generally, stockholders also have the right to vote on (a) any issue that will have a material effect on the corporation, (b) any proposal that will change their individual percentage ownership and (c) any significant contract or financial arrangement. The extent of control depends on the voting rights specified in the corporate charter. Members of the board of director are elected by two methods; straight voting and cumulative voting .Straight voting is essentially one vote per share for each director.

## (ii) Preemptive Rights

Preemptive rights give existing stockholders the first option to purchase a proportionate interest in a new issue of a corporation's stock. The purpose of this provision is to protect stockholders against a loss of voting control and a dilution in the value of their shares.

## (iii) Liquidation Right

As owners rather than creditors, common stockholder receive no priority in the distribution of assets resulting from a liquidation of the corporation. Typically, after assets are sold and liabilities and preferred stock holders are satisfied, little if any cash will be available for common stockholders.

## (iv) Dividend

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

## (v) Common Stock Values

Terms that are frequently used to refer to common stock values includes par value, book value and the market values. These terms are quite different, and in most cases, the rupees amount of these values is not related for an individual stock.

(A) Par Value

The face value of the stock, established at the time the stock in initially issued, is the par value. Without a stock split or other action by the board of directors, the par value of the stock does not change.

(B) Book Value

Book value per share is calculated by dividing the total common equity on the balance sheet by no of shares outstanding. This figure represents the assets value per share after deducting liabilities and preferred stock.

(C) Market Value

Market value in the secondary market is determine by supply and demand factors and reflects the consensus opinion of investors and traders concerning the "value" of stock.

### (vi) Distribution of Earning and Assets

Common stockholders have no guarantee of receiving any periodic distribution of earning in the form of dividend, or are they guaranteed anything 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.

### (vii) Voting Rights

Generally, each share of common stock entitles the holder to one vote in the election of directors and in other special election. Votes are generally, assignable and must be cast at the annual stockholder's meeting.

Thus common stock is more risky than the bonds and preferred stock issued by the same corporation. Although all common stock has certain similar characteristics, risk can vary dramatically for different categories of stock. Before investing in common stock, an investor should understand their risk return characteristics. (John M. Cheney, Edward A. Moses, 1999, p 419-424)

## 2.2 Meaning of Return

Return is the benefit or income received on investment. In other word, investment return is defined as the after tax increase in the value of initial investment. The increase in value of assets can come from two source; a direct cash payment to the

investors or an increase in the market value of the investment relative to the original purchase price. Therefore the rate of returns is the relative value of benefit on investment, which is important to measure the speed at which the investors wealth increase or decreases.

The return is the total gain or lose experienced on an investment over a given period of time. It is commonly measured as the change in value plus any cash distribution during the period, expressed as a percentage of the beginning-of-period investment value (Lawrence J.Gitman, 2001 p.238)

### 2.2.1 The Return of Common Stock

Shareholders expect two forms of return from the purchase of common stock, capital gain and dividend. "Since dividends would be more attractive to shareholders, one might think that there would be a tendency for corporation to increase distribution of dividends. But one might equally pressure that gross dividends would be reduced some what, with an increased in net after tax dividends retained earnings for the corporation." (Smith Dan trap,1977, p-90-91). Thus investor seeks the maximization of dividends as well as stock price.

Sharpe expressed that the rate of return is the rate of change in wealth over a period of time. By applying the following formula return can be calculated as suggested by them;

$$\text{Return} = \frac{\textit{End} \text{ of period Wealth} - \text{Begining of period Wealth}}{\textit{Begining of} \text{ period Wealth}}$$

Similarly, Francis defined the single period rate of return as the total return of an investor which is received during the investment period of holding period stated as percent of the investments price at the start of the holding period or it can be calculated as below;

$$\text{Return} = \frac{\text{Ending Wealth - Begining Wealth}}{\textit{Begining}\ \text{Wealth}}$$

The writer further adds an investor can obtain two kinds of income from an investment in a share of stock:

(i) Income from price appreciation or loss from price appreciation.

(ii) Cash flow income from cash dividend or coupon interest payment.

By considering both of these incomes the rate of return formula can be re-stated in a form appropriate for almost any investment will be as follows:

$$\text{Return} = \frac{\text{Price Change} + \text{Cash Flow(if any)}}{\text{Price at the Begining of the period}}$$

$$R_t = \frac{(P_t - P_{t-1}) + C_t}{P_{t-1}}$$

Where,

$R_t$ = Rate of return during the period t.

$P_t$ = Price or Value of asset at time t.

$P_{t-1}$ = Price or value of asset at time t-1

$C_t$ = cash received during the period of t

Cherey and Moses have also been expressed that rate of return over the holding period is change in price plus cash receipts divided by beginning price. If the investment

is more than one-year period, the rate of return is computed as the equation proposed by Gupta and Choudhary (L.C. Gupta and Utpal K. Choudhary, 2000,p 357-364) as follows;

$$\text{Initial purchase price} = \frac{D_1}{(1+r)^1} + \frac{D_2}{(1+r)^2} + \frac{D_3}{(1+r)^3} + \ldots + \frac{D^n + S^n}{(1+r)^n}$$

Where,

r = internal rate of return (IRR) of discount rate or rate of return

$D^1$, $D^2$ ……$D^n$ = year to year cash dividend and

$S^n$ = the terminal price realized on sale after n years.

Most investors expect regular dividend to be declared and paid on common stocks from a mature and Stable Corporation against they an increase in the market value of common stock overtime. These two components are the return to investors.

Investment decisions are based on expectations about the future, which leads a investor its expected return from the investment. The expected rate of return from the investment for any assets is the weighted average rate of return, using the probability of each rate of return as the weight. It is based upon the expected cash receipts (e.g. dividends or interests) over the holding period and the expected ending, or selling price or it is an ex-ante, or unknown future return. Unless the rate of return is guaranteed, most investors recognize that several rates of returns are possible. Investors summarize the possible rate of return into a single number called the expected rate of return.

The most common formulas for calculating expected rate of return proposed by Gitman are as follows;

$$\overline{R} = \sum_{t=1}^{n} R_i \times P_{ri}$$

Or

$$\overline{R} = \frac{\sum_{t=1}^{n} R_i}{n}$$

Where,

$\bar{R}$ = The expected rate of return

$R_i$ = The return for the $I^{th}$ outcome

$P_{ri}$ = The probability of the $I^{th}$ outcome

n = number of the outcomes considered

$\sum$ = Sign of summation

## 2.3 Meaning of Risk

The dictionary defines risk as "the chance of injury, damage or loss". This is intuitively pleasing definition. However, verbal definitions can be interpreted in different ways by different people. They can be made clearer only by means of other verbal definitions or by examples, which are not always entirely appreciate and are rarely conscious.

However, risk means that we do not know what is going to happen even through occasionally have a good idea of the range of possibilities that we face. In other words, when the firm should 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 p-340)

In the most basis sense, risk is the chance of financial loss. Assets having 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.Gitman, 2001 p-237).

Risk is defined in Webster's as "a hazard, a peril; exposure to loss or injury". Thus, risk refers to the chance that some unfavorable event will occur. If anybody engage in skydiving, such people are taking a change with his life skydiving is risky. (Eugene F. Brigham, Lewis C. Gapenski and Michael C. Ehrhardt, 2001, p-160)

### 2.3.1 Risk on Common Stock Investment

An investment is commitment of money that is expected to generate additional money and every investment entails some degree of risk, it requires a present certain sacrifice for a future uncertain benefit.

In the world of uncertainty, the expected return may not be realized. Risk can be though of as the possibility that the actual return from holding a security will deviate from the expected return. The greater the magnitude of deviation and the greater the probability of its occurrence, the greater is said to be the risk of the security. However, madura (Jeff Madura, 2001,p-257) defines a stock volatility as a measure of risk because it may indicate the degree of uncertainties surrounding the stock's future. Similarly, Hampton defines risk, as the likelihood that the actual return from an investment will be less than the forecasted return; stated differently it is variability of return from an investment.

In the most basic sense, risk is the chance of financial loss. Assets having greater chance of loss are viewed as more risky than those with lesser chance of loss. But Pradhan ( Surendra Pradhan , 2000 pp 303-313) argued that uncertainty and risk are treated separately in financial analysis. In financial analysis, uncertainty refers to fluctuation sides the rate of return in both positive and negative side fluctuation. But the writer agreed with the fact that in the measurement of risk, it is included both positive and negative side uncertainties.

He further adds, the investment decision in the world of uncertainty is mainly influenced by two parameters i.e. the expected value and the standard deviation: which are calculated as follows:

(i) Expected value:

$$E(R) = \sum_{t=1}^{n} R_i \times P_{ri}$$

Where,

E(R) = The expected value of return

$P_{ri}$ = The probability distribution and

$R_i$ = The return on $i^{th}$ outcomes

(ii) Standard Deviation

$$\pm_R = \sqrt{\sum_{t=1}^{n} [R_i - E(R)]^2 \times P_{ri}}$$

Where,

$\pm R$ = Standard deviation of Return

Not only this, the writer again adds that the coefficient of variation (CV) is another way of expressing risk, and is quite appropriate to use it in many areas because it is a measure of relative dispersion whereas S.D. is a absolute measure of degree of variability. The S.D. can not be sufficient to compare two or more projects of different size with different expected values. To overcome this problem, it is necessary to express the magnitude of variability on relative term in common unit for which the C.V. is widely used. In the distribution of returns of returns on stocks, it measures risk per unit of expected return, which is calculated as follows;

$$\text{Co-efficient of Variation (C.V.)} = \frac{\pm_R}{E(R)}$$

Similar as above, Gitman said that the risk of n asset could be measured quantitatively by using statistical tools of S.D. and C.V. The most common satisfied indictor of an assets risk is the S.D.; which measures the dispersion around the expected value of return. The expected value of return is the most likely return on an asset, which is calculated as follows;

$$\pm_R = \sqrt{\sum_{t=1}^{n} [R_i - E(R)]^2 \times P_{ri}}$$

Where,

$\pm R$ = Standard deviation of Return

$P_{ri}$ = The probability distribution and

$R_i$ = The return on $i^{th}$ outcomes

n = number of the outcomes considered and

E(R) = The expected value of return

Or, the formula that is commonly used to find the S.D. of return is a situation in which all outcomes are known to and their probabilities are assumed equal is:

$$\pm_R = \sqrt{\frac{\sum_{t=1}^{n} [R_i - E(R)]^2}{n-1}}$$

C.V. is the measure of relative dispersion that that is useful in computing the risk of assets with the differing expected return. It can be presented as follows:

$$\text{C.V.} = \frac{\pm_R}{E(R)}$$

At last the writer describes the higher the value of C.V., the greater the risk and higher the value of S.D., the greater the risk involved in the asset.

"Every investment involves uncertainties that make future investment returns risky. The source of uncertainty that contribute to investment risk are interest rate risk, purchasing power risk, bull-bear market risk, management risk, default risk, liquidity risk, political risk, industry risk etc. the uncertainties discussed above are the major sources of investment risk, but by means do they make up an exhaustive list. If all the uncertainty could be listed, they would add up to total risk, or total variability return.

Van Horne describes the total risk into two main parts: these are systematic and unsystematic risk, or it can be presented as follows:

Total = systematic risk + unsystematic risk

The writer describes the systematic risk mentioned above can also be known as non diversifiable or unavoidable risk whereas the unsystematic risk can also be known as

diversifiable or avoidable risk. Systematic risk is due to overall market risk. Change in the world energy situation, change in the nation's economy risk that affect security overall, or the investor. Who holds a well – diversified portfolio will be exposed to this type of risk. Unsystematic risk is unique to particular company, being independent of economic, political and other factor. For most stocks, unsystematic risk accounts for between 60-70 percent of stock's total risk or S.D. (James CC. Van Horne and John M. Wacxhouricz, 1997, p 208). Various studies suggest that 15-20 stocks selected randomly are sufficient to eliminate most of the unsystematic risk of a portfolio. Conceptually, diversification can be viewed in the manner portrayed in fig. 2.1 as below:

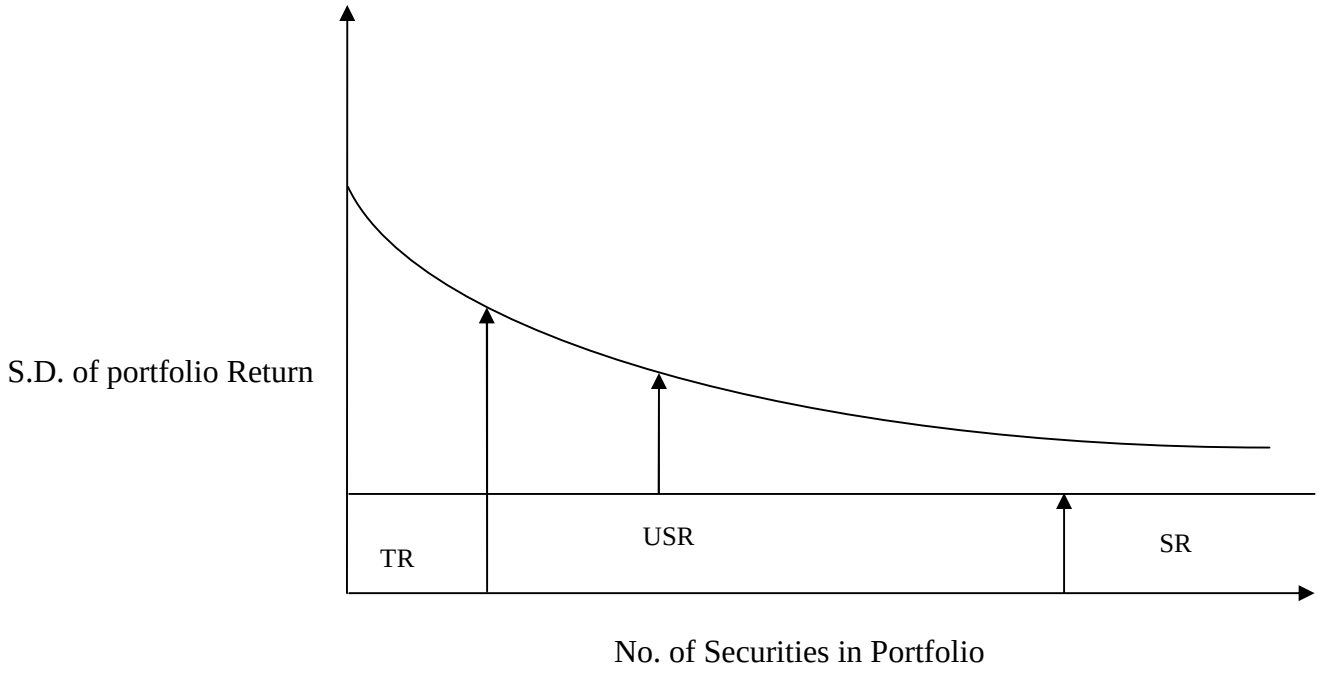



Fig. 2.1:- Total, unsystematic and systematic risk

The figure above represents as the no. of randomly selected securities hold in portfolio is selected, the total risk (TR) of portfolio is reduced is keeping with the reduction of unsystematic risk (USR).Efficient diversification reduces the total risk of the portfolio to the point where only systematic risk (SR) remains.

Similarly, Francis has proposed that total risk can be measured by the help of S.D. or variance denoted as var (ri) which square of S.D. This measure of total risk is portioned into its systematic and unsystematic components, symbolically

Var(ri)= $_i \times Var\ (r_m) + Var\ (e)$

Where,

$Var(r_i)$ = Variance of return from assets.

$_i$ = Beta Coefficient of asset i

$Var\ (r_m)$ = Variance of market returns and

Var (e) = Residual Variance or standard error squared.

The beta coefficient is the index of systematic risk which also measures the slope of the characteristic line. It can be measured by the following formula.

$$j = \frac{Cov(r_j, r_m)}{Var(r_m)}$$

Where,

j = Beta coefficient of asset j

$Var(r_m)$ = Variance of market return and

$Cov(r_j, r_m)$ = Covariance of returns of the asset with the market.

Beta coefficient may be used for making the systematic risk different assets. If the beta is largest than 1, the asset in more volatile than market and is called an aggressive asset. If beta is less than 1, the asset is defensive asset and its price fluctuation is less volatile than the market.

**Relationship between Risk and Return**

In general, it is known that there is positive relation between risk and return.

"The relationship between risk and return is described by investor's perception about risk and their demand for compensation.

Investors will invest in a project only if it promises adequate risk-premium for the level of risk involved. Therefore, it is the investor's required risk- premium that established a link between risk and return. In a market dominated by rational investors,

higher risk will be rewarded higher premium and the trade off between the two assumes a linear relationship between risk and risk premium as illustrated in the figure 2.2 below:

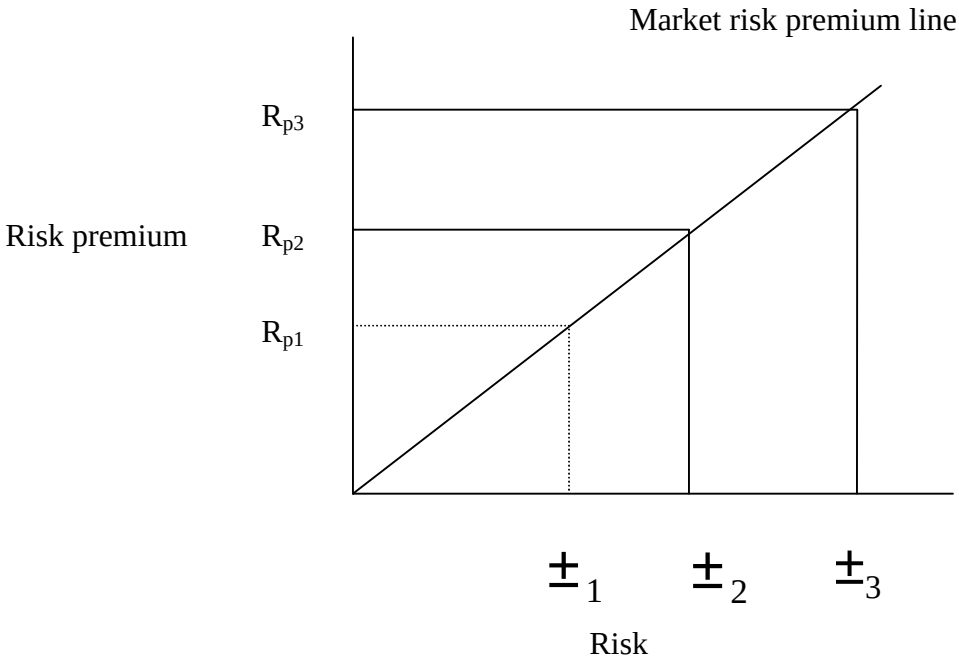



Fig.2.2 General Pattern of risk and Return

The figure represents a higher premium for higher risk in a linear fashion indicating a premium of $R_{p1}$ for degree of risk ($\pm_1$), $R_{p2}$ for degree of risk ($\pm_2$) and so on. Under the assumption of linear relationship, the risk premium increase or decrease in proportion to change in the level of risk.

According to Hampton, the expected return from any investment proposal will be linked to a fundamental relationship to the degree of risk in the proposal. In

Order to be acceptable, a higher risk proposal must offer a higher forecast return than lower risk proposal. He tries to show the relationship with the help of figure 2.3 given below.

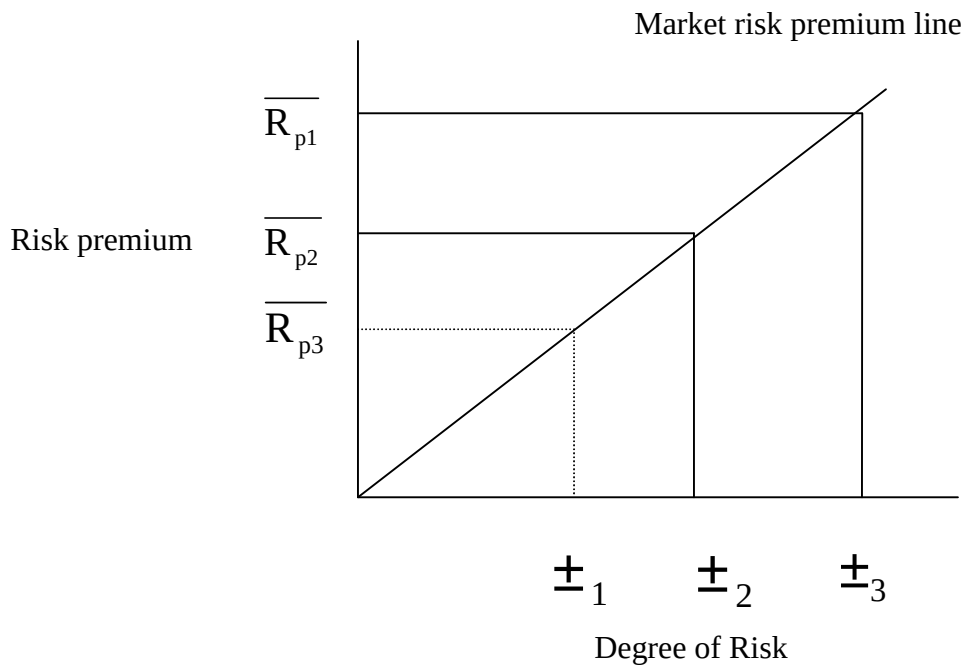



Fig.2.3: General Pattern of Risk and Return

The figure representation if the level of risk increase, the return will also increase. Here it is seen that the value of expected return is increase from level $\overline{R_{p1}}$ to $\overline{R_{p2}}$ as a result the level of risk is also increased from level $\pm_1$ to $\pm_2$. Similarly, if it increases from the level $\overline{R_{p2}}$ to $\overline{R_{p3}}$ consequently the level of risk will also increase from $\pm_2$ to $\pm_3$ and vice-versa.

"Based on the behavior of the risk averse investors, there is implied an equilibrium relationship between risk and expected return for each security. In market equilibrium, a security will be expected to provide a return commensurate with its unavoidable risk. This is simply the risk that can not be avoided by diversification. The greater the unavoidable risk of a security, the greater the return that investors will expect from the security. The relationship between expected return and unavoidable risk, and valuation of securities that follows, is the essence of the capital asset pricing model (CAMP). This model was developed by Sharpe and Lintner in the 1960s and it has important implications for finance ever since. CAMP model is simple in concept and has real world

applicability." Assets having a greater probability of loss are left as more risky than those with

less chance of loss. Investor must seek to identify the securities having low risk and having higher return. However, return cannot be increased but by well diversification of the funds in different stock making a portfolio, unsystematic risk can be reduced and can be eliminated if diversification is efficient. One way in which investor can reduce risk by spreading their capital across range of investments. This can be known by the following proverb. "Don't put all the eggs in a single basket."

While consulting different books from different authors, it is found that large no. of investor is risk averter. They generally invest their investment in portfolio. Investors rarely place their entire wealth into a single asset rather they contact a portfolio or group of investment. Therefore, it is needed to extent analysis of risk and return to include portfolio.

The expected return on a portfolio is simply the weighted being the fraction of the total portfolio invested in each asset.

$$\overline{R_p} = \sum_{t=1}^{n} W_i R_i$$

Where,

$\overline{R_p}$ = The expected return on the portfolio

$w_i$ = The Weight of individual stock i.

n = Total no. stock in the portfolio.

$R_i$ The return of individual stock i.

$w_i$ is the fraction of the portfolio's rupees value invested in the stock 'i'. It is the value of the investment in stock 'i' divided by the total value of the portfolio and that the $w_i$ must sum to 1.

While the portfolio expected return is a straight forward weighed average of returns on the individual security. Where as portfolio standard deviation is not the weighted average of individual security standard deviation. To take a weighted average of individual security standard deviations would be to ignore the relationship or

correlation between the return. Correlation between securities returns complicates the calculation of portfolio standard deviation by forcing to calculate the co-variance between return for every possible pair wise combination of securities in the portfolio. But this dark cloud in mathematical complication contains a silver lining correlation between securities provided the possibility of eliminating some risk without reducing potential return.

The standard deviation of probability distribution of possible portfolio, $\pm_p$ is :

$$\pm_p = \sum_{j=1}^{n} \sum_{k=1}^{n} wjwk¢jk$$

Where,

$\pm_p$ = Standard Deviation of Portfolio.

n = Total no. of different securities in the portfolio.

$w_j$ = Proportion of the total funds invested in security j.

$w_k$ = Proportion of the total funds invested in security k.

$¢jk$ = Co- variance between possible return for securities j and k.

The correlation coefficient always lies in the range from '-101' to '1.0'. A positive correlation coefficient indicates that the returns from two securities generally move in the same direction, while a negative correlation coefficient implies that they generally move in opposite direction. The stronger the relationship the lower the correlation is to one of two extremes values.

The portfolio theory provides a normative approach to the investor's decision to invest in assets or securities under risk. It is based on the assumption that investors are risk averter. This implies that investors hold well diversified portfolios instead of investing their entire wealth in a single assets or securities. Thus the investor holds a well diversified portfolio rather than individual assets or securities. The second assumption of the portfolio theory B is that the returns of securities are normally distributed. This means that the mean (the expected value) and variance (or standard deviation) analysis is the foundation of the portfolio decision. (I.M. Pandey,2001,pp 338-341)

The risk of a portfolio would be measured in terms of its variance or standard deviation) of a portfolio is not simply the weighted average of variance (or S.D.) is affected by the association of movement of return of two securities. Covariance between two securities.

i. Determine the expected return for securities.

ii. Determine the deviation of possible returns for each security.

iii. Determine the sum of product of each deviation of return of two securities and probability.

We can use the following equation to calculate co-variance, i.e.

$$\text{Cov}_{jk} = \sum_{i=1}^{n} P_i [R_j - \overline{R_j}][R_k - \overline{R_k}]$$

Where,

The variance of the two security portfolio is given by the following equations;

$$¢_p^{\,2} = ¢_j^{\,2} w_j^{\,2} + ¢_k^{\,2} w_k^{\,2} + 2 w_j w_k ¢_j ¢_k Cov_{jk}$$

The variance of a portfolio is not simply the weight average of the variance of returns of the individual securities in the portfolio. The variance of a portfolio includes the proportionate variance of the individual's securities and covariance of the securities, along with the weights of securities. The covariance depends on the correlation between the securities in the portfolio. Thus the overall risk of the portfolio would be less than the weighted average risk of the securities for two or negative correlation. It is a common practice to use a tabular approach, as given, to calculate the variance of a portfolio,

I

| | |
|---|---|
| $¢_j^{\,2}$ | $Cov_{jk}$ |
| $Cov_{jk}$ | $¢_k^{\,2}$ |

I I

| | |
|---|---|
| $w_j^{\,2}$ | $W_j W_k$ |
| $W_j W_k$ | $W_k$ |

I I I

| | |
|---|---|
| $¢_j^{\,2} W_j^{\,2}$ | $W_j W_k Cov_{jk}$ |
| $W_j W_k Cov_{jk}$ | $¢_k^{\,2} W_k^{\,2}$ |

The first two tables contain the variance, covariance and weights of two securities 'j' and 'k' in the portfolio. The third table gives the cell-by-cell product of the two

tables. The total of values in the third table is the variance of the portfolio of securities 'j' and 'k' the question arises is that what is the best combination of 'j' and 'k' in that portfolio variance B minimum A portfolio that has the lowest level of variance (risk) is referred to the optimum portfolio. A risk –averter investor will have a trade off between risk and return. We can use the following formula for estimating optimal weights of securities 'j' and 'k'.

$$W_j^* = \frac{¢_k^2 - Cov_{jk}}{¢_j^2 + ¢_k^2 2Cov_{jk}}$$

Where,

$w_j$* = The proportion of investment in securities 'j'. And thus investment in security 'k' will be'1-$w_j$*'. Any other combination of 'j' and 'k' will yield a higher variance.

Investing wealth in more than one security can reduce the risk. However, the extent of the benefits of portfolio diversification depends on the correlation between returns of securities.

## Sharpe: The Single Index Model

The Markowitz Model was theoretically elegant and conceptually sound. However, its serious limitation was that it related each security to every other security in the portfolio, demanding the sophistication and volume of work well beyond the capacity of all but a few analysts. Consequently, its application remained severally limited until William F. Sharpe Published a model simplifying the mathematical calculations required by the Markowitz Model.

Sharpe assumed that, for the sack of simplicity, the return on a security could by regarded as being linear related to a single index like the market index. Theoretically, the market index should consist of all the securities trading on the market. However, a popular average can be treated as surrogate for the market index. Acceptance of the idea of a market index, Sharpe argued, would obviate the need for calculating thousands of co-variances between individual securities, because any movement in securities could be attributed to movements in the single underlying factor being measured by the market

index. The simplification of the Markowitz Model has come to be known as the Market Model or Single Index Model (Bhalla, V.K.,2001,p-526).

**Characteristic Lines**

In major market moves, most securities move in the same direction, although at different rates. An analyst's view of the relationship between returns on the market portfolio can be expressed by using a characteristics line. Figure-I shows an example. The vertical axis plots the excess return on the security in question. This is the difference between the holding period return on the security and the risk less rate of interest for that period. In symbols;

Excess return on security (i) = $\overline{Ri} - T$

Where,

$\overline{Ri}$ = holding period return on security i.

T= riskless rate of interest.

The horizontal axis in figure-I plots its excess return on the market portfolio, in symbols;

Excess return on market portfolio = $\overline{Rm} - T$

Where,

$\overline{Rm}$ = holding period return on the market portfolio.

T = riskless rate of interest.

The market portfolio includes all securities, each in proposition to market value outstanding. The characteristics line, summarizing the relationship between the two excess returns, can be written as follows:

$$\overline{Ri} - T = \sim_i + {}_{im}(\overline{Rm} - T) + r_i$$

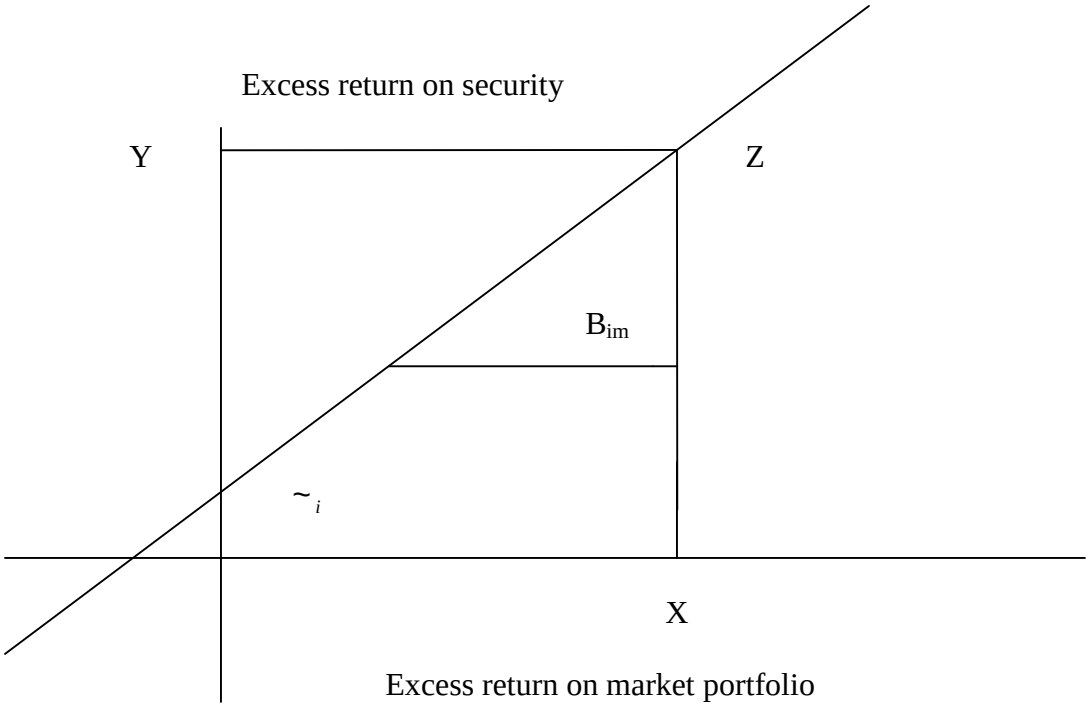



Fig.2.4: A security characteristics Line

The value of alpha (~$_i$) and beta ( $_{im}$) indicate the vertical intercept and slope, respectively, of the line, as shown in figure 1. The value of ~$_i$ can be thought of as an excess return on the security that goes with an excess return of zero on the market portfolio, whereas $_{im}$ is the ratio of a change in the securities excess return to a change in the market portfolio. A beta of one indicates that if the market portfolio excess return is

1% larger than expected, than the best guess is that the securities excess return is also likely to be 1% larger than expected. A beta of 2.0 indicates that if the market portfolio's excess return larger than expected, the best guess is that the securities excess return is likely to be 2% larger than expected. A beta of 0.5 indicates that if the market portfolio's return is larger than expected, the best guess is that the security's excess return is likely to be 0.5% of 1% larger than expected. And so on.

Securities with beta values greater than one are termed aggressive: in up markets their prices tend to rise at a faster rate than the average security. On the other hand, they tend to fall to rise at a faster rate in down markets. Securities with beta values less than

one are termed defensive: in up markets their prices tend to rise at a slower rate than the average security. On the other hand, they tend to fall at a slower rate in down markets.

The nature of the residual component of the unsystematic return, known as the error, $\bar{r}_1$, represents the uncertain portion of the non market of the excess return on security i. This can be demonstrate by referring the characteristics line into two parts, as follows;

$$\overline{R_i} - T = [\overline{\ _{im}}(\overline{R_m} - T)] + [\sim_1 + \bar{r}_1]$$

Market (systematic) Component — Non-market (unsystematic) Component

The term in the first set of brackets is the market related portion of excess return; the tern in the second set is the non market portion. By convention, represents the expected non market excess return, while $r_i$ represents the deviations the from this expectation. Before the fact, the best guess is that $r_i$ will be zero.

## 2.4 Review of Capital Assets Pricing Model (CAMP)

The relationship between expected return and unavoidable risk and the valuation of securities that follows, is the essence of the capital assets pricing mode (CAMP), This model was developed by William F. Sharpe (Who was the novel prize winner in economics in 1990) and John Linter in the 1960's and it has had important for finance ever since.

With this method the investor needs to estimate the expected returns and variances for all securities need to be estimated and the risk free rate needs to be determined. Once this is done the investor can identify the composition of the tangency portfolio as well as its expected return and standard deviation. At this junction the investor can proceed to

identify the optimal portfolio where one of his her indifference curve touches but does not interest the efficient set. This portfolio involves an investment in the tangency portfolio along with a certain amount of risk free borrowing a lending because the efficient set in linear.

Such an approach to investing can be viewed as an exercise in normative economics. Where investors are told what they should do. Thus, the approach is descriptive in nature. This model provides the intellectual basis for a no of the current practices in the investment industry.

As with any model, there are assumptions to be made. Some of the assumptions behind the CAMP are also behind the normative approach to investing. These assumptions are as follows:

i. Investors evaluate portfolio by looking at the expected returns and standard deviations of the portfolio over one period over one period horizon.
ii. Investors are never satisfied, so when given a choice between two, they will choose the one with the higher expected return.
iii. Investors are risk averse, so when given a choice between two identical portfolios. They will choose the one with the lower S.D.
iv. Individual assets are infinitely divisible, meaning that an investor can buy a fraction of a share of he or she so desires.
v. There is a risk free rate at which an investor may either land (i.e. invest) money or borrow money.
vi. Taxes and transaction costs are irrelevant.
vii. All investors have the same one-period horizon.
viii. The risk free rate is the same for all investors.
xi. Information is freely and instantly available to the investors.
x. Investors have homogeneous expectations, meaning that they have the same perceptions in regard to the expected returns, standard deviations and covariance of securities.

By considering the above assumption, the writers have further described that in the world of CAMP, it is a simple matter to determine the relationship between risk and return for efficient portfolios. Figure 2.4 Portrays it graphically.

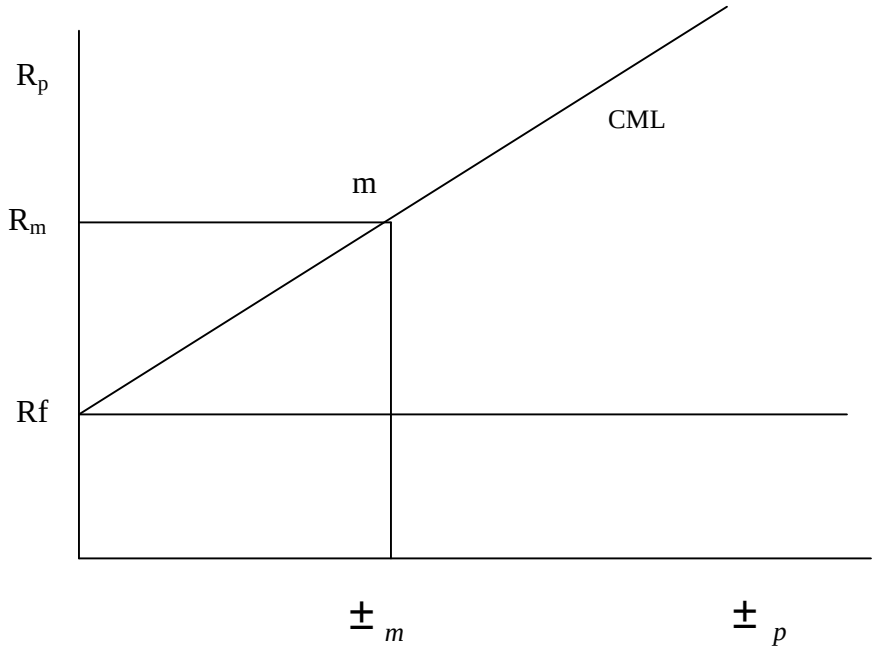



Fig.: 2.5: The Capital Market Line (CML)

In the above figure, point 'm' represents the market portfolio and 'Rf' represents the risk-free rate of return. Efficient portfolio plot along the line starting at 'Rf' and going through 'm' and consists of alternative combinations of risk and return obtainable by combining the market portfolio with risk-free borrowing or lending. This linear efficient set of the CAMP is known as the capital market line (CML). All portfolios other than those employing the market portfolio and risk free borrowing or lending would lie below than CML, although some might plot very close to it. The slope and intercept of the CML can be though of the price of time and the price of risk, respectively.

The CML represents the equilibrium relationship between expected return and S.D. for efficient portfolios. Individual risky securities will always plot below the line because a single risky security when held by itself is an inefficient portfolio. The CAMP does not imply any particular relationship between the expected return and the S.D. of an individual security.

The exact form of the equilibrium relationship between risk and return can be written as:

$$\bar{r}_i = rf + [\frac{r_m - rf}{\pm_m^2}]\pm_{im}$$

Where,

$r_i$ = Return from security 'i'

$r_f$ = Risk-free rate of return.

$r_m$ = Market return

$\pm^2$ = Market variance and

$\pm_{im}$ = Covariance of security 'I' with market portfolio.

As the slope is positive, the equation indicates that securities with larger covariance with market ($\pm_{im}$) will be priced so as to have large expected returns ($r_i$ ). This relationship between return in known as the security market line (SML) which is shown as below:

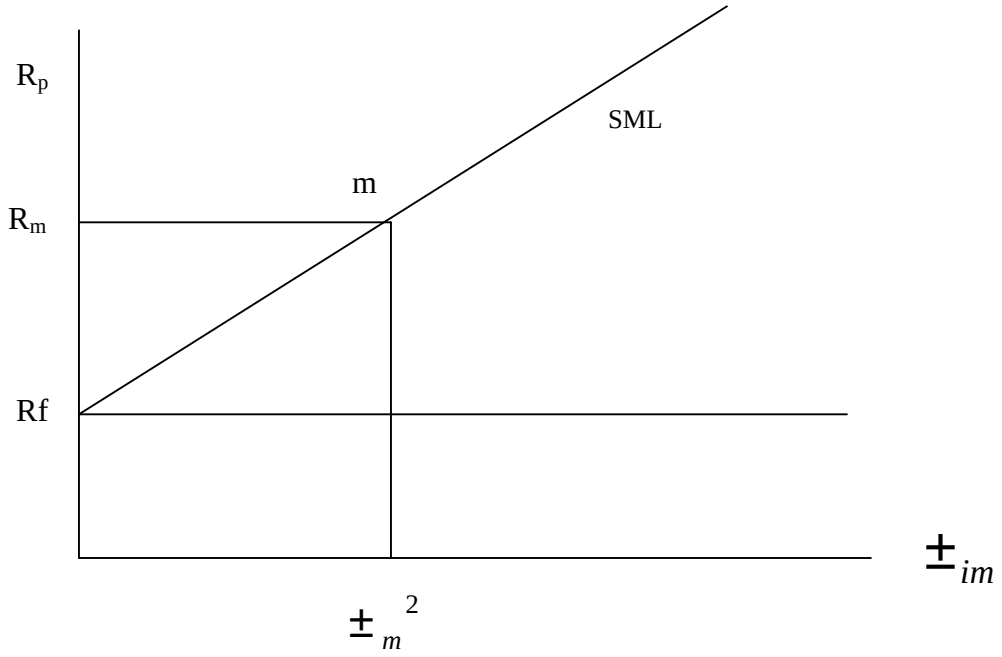



Fig.2.6: Covariance Version of SML

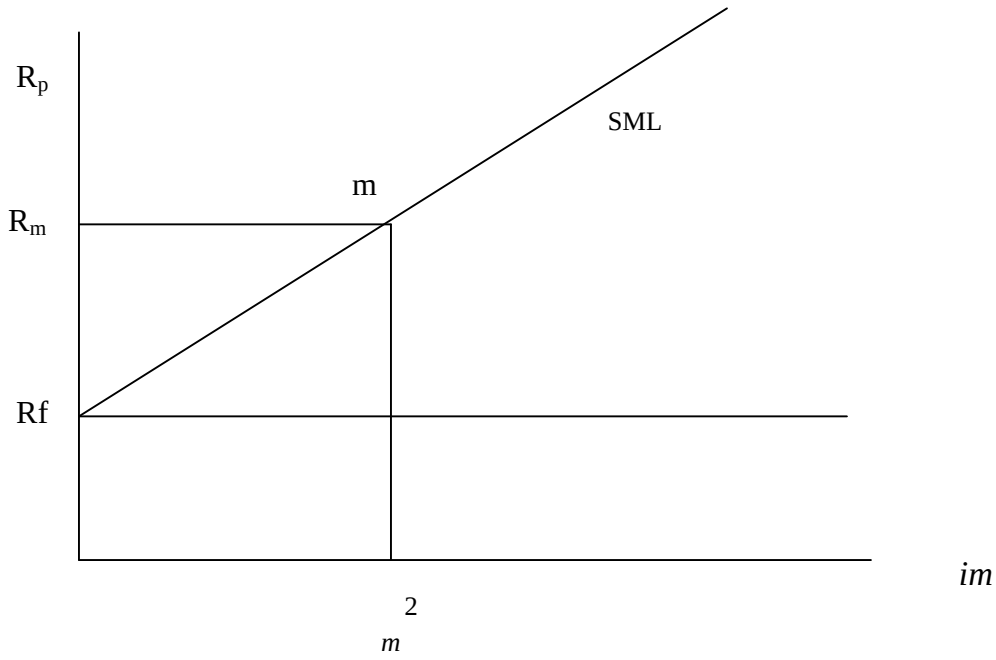



Fig.: 2.7: Beta Version of SML

Another way of expressing the SML is as follows:

$$\overline{R_i} = Rf + (R_m - Rf)\ _{im}$$

The term $_{im}$ is known as the beta coefficient for security 'i' and is an alternative way of representing the cov. of a security. Fig.2.6 as a different version of the SML as can be seen in, although having the same intercept as the earlier version on fig.2.5, Rf it has a different slope. The slope of this version is ($R_m$ - Rf ) whereas the slope of the earlier version was $[\frac{\overline{r_m} - rf}{\ _m^2}]$. The major implication of the model is that the expected return of an asset will be related to a measure of risk for that asset known as beta. The exact manner in which expected return and beta are related is specified by the CAMP

Market risk is related to the risk of the market portfolio and to the beta of the security in question. Securities with large beta will have larger amounts of market risk. In the world of the CAMP, securities with larger beta will have larger expected returns.

These two relationships together imply that securities with larger market risk should have larger expected returns. Non –market risk is not related to beta. This means that there is no reason why securities with larger amounts of non-market risks should have larger amounts of non-market risks should have expected rewarded for bearing market risk but not for bearing non-market risk.

**Role, Relevance and Current Status of the CAMP**

The CAMP is extremely appealing at an intellectual level. It is logical and rational, and one someone works through and understands the theory, his or her reaction is usually to accept it without question. However, doubts begin to arise when one thinks about the assumptions upon which the model is based and these doubts are as much reinforced as reduced by the empirical tests. Role, relevance and current status of the CAMP are as follow:

i. The CAMP framework is clearly a useful way to think about the risky ness of assets. There a conceptual model of CAMP is of truly fundamental importance.

ii. The CAMP is logical in the sense that it represents the way risk-averse people ought to behave.

iii. It is appropriate to think about money financial problem is CAMP framework. However, it is important to recognize the limitation of the CAMP when using it in practice.

iv. When CAMP are applied in practice, the CAMP provide neat, precise answer to important questions about risk and required rate of return.

v. Investors will always combine a risk-free asset with a market portfolio of risky assets. They will invest in risky assets in proportion to their market value.

vi. Investor will be compensated only for that risk which they cannot diversify. This is the market related risk (Systematic Risk)

Thus, the concept of risk-return as developed under CAMP has intuitive appeal and they are quite simple to understand. Financial managers use these concepts in a number of financial decision making such as valuation of securities, cost of capital measurement, investment risk analysis etc. (I.M. Pandey, 2001 p.363)

## 2.5 Review of Arbitrage Pricing Theory (APT)

The CAMP is an equilibrium model that describes why different securities have different expected return. In particular, this positive economic model of assets pricing assets that securities have different expected returns because they have different betas. However, there exists an alternative model of assets pricing that was developed by Stephen Ross. It is known as arbitrage pricing theory (ATP).

CAMP requires a large no. of assumptions. However, APT makes fewer assumptions one primary APT assumption in that each investor, when given the opportunity to increase the return of his or her portfolio without increasing its risk, will proceed to do so. The mechanism for doing so in involves the use of arbitrage portfolio.

Arbitrage is the earning of risk less profit by taking advantage of differential pricing for the same physical assets or security. Arbitrage typically entails the sale of a security at a relatively high price and simultaneous purchase of the security at a relative low price.

Arbitrage activity is a critical element of modern efficient security markets. Because arbitrage profits are by definition risk less, all investors have incentives to take advantage to them whenever resources and inclination to engage in arbitrage then others. However, it takes relatively few of this active investor to exploit arbitrage situation by their buying and selling actions. (William F. Sharpe, Gordon j. Alexander, Jaffory V. Bailey, 1999 pp 321-324)

APM does not assume that investors employ mean variance analysis for their investment decisions. However, APM is founded on the notion that investors are rewarded for assuming no diversification risk. Diversifiable risk is not compensated. Beta is considered as the most important single factor in CAMP that captures the systematic risk of an asset. In AMP, there may be one or may macro-economic factors that may measure the systematic risk of an asset. The fundamental logic of APM is that investors always include in arbitrage whenever they find differences in the returns of asset with similar risk characteristics.

In APM, the return of an asset is assumed to have two components, predicable and unpredictable returns. Thus, return on asset ‘j’ will be

$E(R_j) = R_f + UR$

Where,

$R_f$ = predicable return ( Risk free return on a zero beta asset)

UR = the unanticipated part of the return

There are two sources of the unexpected return, the firm specific and the market related. The firm-specific factors are special to the firm and affect only the firm but the market related factors all asset and they comprise macro economic factors.

APM does not indicate the factors that explain the assets return. The factors are empirically by the factors. The following factors were found in a research study in the USA that is important in explaining the expected return.

i. Industrial production
   ii. Changes in default premium
   iii. Inflation rate
   iv. Changes in the structure rate
   v. Changes in the real rate of return

Conceptually, it is the compensation over and above, the risk free rate return that investors require for the risk contributed by the factor. The beta of the factor is the sensitivity of the assets return to the changes in the factor I>

The primary theoretical advantages of the APT is that it permits several economic factors to influence individual stock returns, whereas the CAMP assumes that the impact of all factors, except those unique to the firm, can be captured in a single measure, the volatility of the stock with respect to the market portfolio. ATP requires fewer assumptions than the CAMP and hence is a more generally theory. Finally, the does not assume that all investors hold the market portfolio.

However, the ATP faces several major hurdles in implication, the most several beings that the ATP does not identify the relevant factors. Thus, APT does not tell us what factors influence returns, nor does even indicate how many factors should appear in the model. There is some empirical evidence inflation, industrial production and the spread between low and high-grade bonds.(Eugene F. Brigham, Louis C. Gapenski and Michael C. Ehrhardt,2001, p-225)

Thus, the basic premise of the of the APT is that the return can be a function of several factors rather than just one. If the factors can be identified and theory can be satisfactorily explained, then the APT might replace the CAMP as the primary model describing the relationship between risk and return.

## 2.6 Review from Related Studies

### 2.6.1 Review of Related Studies in General

These days information highway or the internet has become to the most easily accessible medium to gain information in any subject matter. In the study period, different books and articles have been consulted.

The objective of this section is to present how the relation between risk and return is measured by different researchers. This section also deals with the empirical studies on stock returns.

**Studies on Risk Returns**

Malkei (Burton G. Malkiel, 1995, pp 551-572.) analyzed the returns from investing in equity mutual funds from 1971 to 1991, utilizing a data set including returns from all mutual funds existing each year. This study also evaluated the performance of mutual funds in terms of risk-adjusted returns. For this it used the CAMP model as;

$R_{fd} - R_f = \sim + \ (R_{MKT} - R_f) + E_{fd}$

Where;

$R_{fd}$ = Funds return

$R_{MKT}$ = Market return

$R_f$ = Risk – free return

~ = It is the intercept and

= It is the beta, which measure the risk

The major findings of the study among others were;

i. In an aggregate, funds have under performed benchmark portfolios after management expensed and even gross expense.

ii. The average alpha (~ ) is negative with returns are used and positive when gross returns are used, but neither is significantly different from zero.

iii. While considerable performance persistence existed during the 1970's there was no consistency in fund returns during the 1980's

iv. Fund beta's and returns were not related as the CAMP suggest.

One the analysis of the performance of mutual funds in USA in terms of risk adjusted returns, kothari and Warner (S.P. Kothari and Jerold B. Warner, 2001, pp 1985-2010) have used the following model;

$$R_{pt} - R_{ft} = \sim_{p} + \quad_{p}(R_{mt} - R_{ft}) + E_{pt}$$

$R_{pt}$ = Mutual fund portfolio return in month t.

$R_{ft}$ = Risk –free return in month t.

$R_{mt}$ = Return on Market Portfolio in month t.

$E_{pt}$ = While on market Error term and

$\sim_{p}$ = Intercept (regressions)

$_{p}$ = Slope (beta risk) coefficients.

They also have been used size, book market and momentum matched return to measure performance. They found more or less similar results with the result of Malkiel's study.

A study on conventional measures of the total risk based by common stockholders, Athorny, Jones and Swany (Joseph Athiorny, Charter P. Jones and Itzdnk Swary, 1980, pp. 1002-1026) used the total risks as the variability of rates of return. They composed of three different risk elements for the variance of the rate of return on 'i$^{th}$ ' stock by using the following market model;

$$\text{Var}(R_j) = \quad_{j}^{2} \times \text{var}(R_m) + Var(e_i)$$

Where,

$\text{Var}(R_j)$= Total variance of return on Security 'j'

$\text{var}(R_m)$ = Variance of the return on the market portfolio of risky assets.

$Var(e_i)$ = Variance of the disturbance term of security 'j'

$_j$ = Covariance ($R_j$, $R_m$)/ var($R_m$) and covariance $e_j$,$R_m$

They concluded that the rate of return is common stock investment is affected by the three type of risk that are shown in above maintained market model.

## Studies on Stock Returns

The study on Return on Indian Equities; 1980-1997, Gupta and choudhary examined the long-term rates of return on a representative portfolio of thirty (30) Indian companies of the BSE sensex over 1980-1999. The study has compared the rate of return over various holding periods and decomposed it into capital appreciation and dividend. They calculated 5 years, 10 years moving adverse rate of return. The findings of their study among others were as follows;

i. The average rate or return (ARR) on the Indian equity was 24.67% during 1980-85 periods. It becomes highest (35.34) during 1995-99 and decreased to -4.43% in 1994-99 periods.
ii. Average return, as capital appreciation and dividend were 19.58% and 5.08 during 1980-85. Average capital gain yield increased to 37.85% in period 1988-93 and decreased to -6.36% during 1994-1999. But average dividend yield continuously decreased to 12.2 times in 1999.
iii. Average annual growth rate of return of earnings per share was 12.58% during period of 1980-96 period again decreased to 11.91% in the period of 1989-94

On the analysis of relationship between expected growth rate and stock returns: Porta(Rafael L. Porta, 1996, pp 1715-1742) identified that one year post formulation low return for stock with low expected growth rates was 20% higher, on an average, than the return for the stocks with strategy based on buying stocks with low price to expected growth ratio and selling short stocks with high price to expected growth ratio yielded excess returns within his sample.

Another study by Lenont (Owen Lenont, pp. 1563) tried to identify the variables, which could predict expected returns well. For this, he analyzed the relation of dividend yield, earnings yield and dividend pay-out ratio with returns employing the functioned relationship established as follows:

$$R_{m.t.} - R_{f.t.} = f(PREL, d_t - p_t, d_t - e_t, e_t - p_t)$$

Where,

$R_{mt.}$ = quarterly excess return on S and P composite index.

$d_t - p_t$ = Log dividend yield

$d_t - e_t$ = Log dividend pay out ratio

$e_t - p_t$ = relative bill rate

The study concluded that the aggregate dividend pay -out ratio had forecasted excess returns on both stocks and corporate bonds in post war USA data. High dividends had forecasted high returns, but high earnings forecasted low returns. Dividend and earnings contributed substantial explanatory power at short horizon.

### 2.6.2 Review of Past Studies

Prior to this study, several research works have been done by various students regarding the various aspects of risk and return of the common stock. In this study only relevant subject matters are viewed, which are as follows;

On the major objectives to analyze and describes the risk and return of Common stocks, Gurung (Dambar Gurung,2000) conducted a thesis by considering three manufacturing and processing companies as sample covering five years (i.e. F/Y 2050/51 to 2054/55). The main findings of the study were as follows;

i. Expected return and coefficient of variation of Nepal Lever Ltd. are higher than other observed companies.
ii. By the help of investment portfolio the risk can be minimized significantly for manufacturing and processing companies.
iii. There is no significant difference between average rate of return of manufacturing and processing companies and returns on market portfolio.
iv. There is significant difference between the portfolio beta of manufacturing and processing companies and market beta.

Sapkota (Mrs. Yag Sapkota, 2001) conducted a thesis on the topic of risk and return analysis in common stock investment. The major objective of the study was to describe the risk, return and other relevant variables that directly affect the investment of

common stock. The study considered eleven (11) listed companies from different industry and analyzed their data from the F/Y 2049/50 to 2056/57.

The major findings of the study were as follows:

i. Finance and insurance companies have maximum expected return(i.e. 200.40%),hotel industry has also high expected return(i.e. 158.72%) and trading industry has low expected return among them i.e. 33.71%
ii. S.D. (i.e. total risk) of finance and insurance companies is the highest i.e. 5.13.17 and the lowest of trading i.e. 0.625.
iii. There is no significant difference between the average return of selected companies and market portfolio return.
iv. There is significant difference between the portfolio beta of selected companies and market beta or the portfolio beta of the selected companies is not equal to l.

Another study of Risk and Return on Common Stock Investment by Adhikari (Deepak Adhikari,2002) analyzed nine year's data (i.e. F/Y 1992 to 2001 A.D.) of eight listed commercial banks and primary data from two hundred fifty (250) people through questionnaire. The major objective of the study was to assess the risk and return on common stock investment of the listed commercial banks on the basis of financial tools. The other major objective was to identify the correlation returns of commercial banks. The major findings of the study were as follows;

i. Expected return of Bank of Kathmandu is Maximum (i.e. 112.67%) and is least in.
ii. Himalayan Bank (i.e., 13.3%), which is also less than market return.
iii. According to C.V., the Standard Chartered Bank has the best common stock, which has 0.9689 risks per 1% return; whereas Himalayan Bank has highest risk per 1% of return (i.e., C.V. of it is 2.9261).
iv. According to the result of beta, Bank of Kathmandu is most volatile and Standard Chartered Bank is less volatile (i.e. 0.2218<1.9656).
v. All bank's common stock move positively with market as their beta is positive.
vi. Standard Chartered Bank and Nepal SBI Bank have negative correlation between their returns.

On the analysis of primary data, most of the investment investors invest only keeping the return in mind but they are found unable to calculate the return in mind but they are found unable to calculate the risk of the security. They are found having lack of the knowledge of the C.V. one hundred ninety (190) people are found choosing higher market price of security in appropriate for the investment, third (30) are found choosing the market price as well as the popularity. Remaining are found to consider other factors, i.e. C.V., beta, correlation between returns and CAMP etc. at the end, he concluded that the investors investing more than one security are not found to analyze the portfolio before investment.

Another study of Risk and Return Analysis on Common Stock Investment of Listed Commercial Banks in Nepal by Prasad Yadav Rambinesh analyzed five year's data (i.e. F/Y 2000 to 2004 A.D.) of five listed commercial banks. The basic objectives of this study is to assess the risk associated with return on common stock investment of the listed commercial banks on the basis of selective financial as well as statistical tools and to analyzed the volatility of common stocks and relevant variables as an affecting factors in portfolio construction of common stock. To identify the correlation between return of each commercial banks and suggest an optimal portfolio of sample banks. The major findings of this study were as follows;

1. Without proper analysis of individual securities of industries and overall market, it is almost impossible to be at the stock market. General knowledge about political economical and technological trend is advantageous.
2. The higher risk of common stock may have greater possible return.
3. On the basis of market capitalization, the commercial banking sector is doming all other sectors that mean the banking sector has good performance than others.
4. Commercial banking sector has the highest expected return (0.0837) but hotel (-0.0284), trading (-0.0504) and development bank (-0.1458) sectors have negative expected return.
5. All the five listed commercial banks stocks are under priced i.e. investors need to buy these stocks.

6. By using Sharpe single index model for optimal portfolio, we can use our fund to 7.82% in NIBL's securities, 87.86% in SCBL's securities and 4.32% in NABIL's securities.

7. The first hypothesis is based on the taste of average return of common stocks of listed companies are equal to the market return or not and it was found that if the level of significance is 5%, Null hypothesis is accepted. i.e. Average returns of listed commercial banks are equal to market return,

8. The second hypothesis is based on the test the significance difference in average return of common stock of listed commercial banks and overall market portfolio and it was found that the Null hypothesis is accepted at 5% of level of significance i.e there is no significance difference in average return of common stock of listed commercial banks and overall market portfolio.

### 2.6.3 Review of Publications in the same area

Views expressed by different persons in their articles and seminar regarding risk and return of common stock of commercial banks are presented or reviewed here in this topic.

Radhe Shyam Pradhan (1993) expressed his view in relation with subject to certain with the topic, "(Stock Market on a Small Capital Market: A Case in Nepal).: Pradhan has summarized the following findings:

i. Dividend per share and market price per share was positively correlated.

i.i. There are positive relationship between dividend payout and liquidity.

iii. Higher the earning on the stocks, larger the ratio of dividends per share to market price per share.

iv. There are positive relationship between dividend payout and liquidity. Manohar Krishna Shrestha (2049) expressed his view relation with subject to certain extent with the topic, "Shareholders Democracy and Annual General Meeting feed back, portfolio Analysis". Shrestha's findings are as follows:

i. In many cases the existing authoritarian mentality of management seems to have not considered the shareholders in the managerial plans and policies.
ii. Top- level decisions often by pass the interest of shareholders.
iii. The annual general meeting has become a plate-form for shareholders to Express their opinions and grievance in front of the management and Board of directors.
iv. Many general meetings feedback reveal no serious response to the feelings of shareholders. Thus, it reflects unwillingness of the management and board of directors to change their traditionally held activities towards shareholders.

Khagendra Prasas Ojha (2000) in his mini research paper, "Financial performance and Common Stock Pricing" concludes that, " An investment in common stock of a corporate from neither ensures annual return nor ensure the return of principle. Therefore, investment in common stock is very sensitive on the ground of the risk. Dividend to common stockholders is paid only if the firm makes on operating profit is paid only if the firm makes an operating profit after tax and preference dividend. The company can return the principle in case of its liquidation only to extent of the residual asset after satisfying to all of its creditors and preferential shareholders, besides this, investor have to common stock, which could be earned investing fund elsewhere in the next best opportunity.

Study is focused on the financial performance where financial activities involve decision regarding;

i. Forecasting and planning of financial requirement.
ii. Investment decision
iii. Financial decision

Further, Ojha added that the stock price in Nepal is determined more by other factors rather than the financial performance of the concerned company.

# CHAPTER-3
# RESEARCH METHODOLOGY

## 3.1 Introduction

Research methodology is a way to solve the research problem systematically. (P.R. Joshi, 2002, p-19). The research methodology considers the logic behind the methods used in the context of research study and explains why particular method or technique is used. It also highlights about how the research problem has been defined, what data have collected, what particular method has been adopted, why the hypothesis has been formulated etc.

The basic objective of this study is to analyze the risk and return of the five commercial banks, which are listed in NEPSE. As most of the data are quantitative, the research is based on scientific methods. It is the based on scientific methods. It is the complication of technical as well as logical on the basis of secondary data.

### 3.2 Research Design

An architect prepares a blueprint before he/she approves a construction. In the same way a researcher makes a plan of his/her study before undertaking the research work, which will unable to save time and resources. Such a plan or blueprint for study is called a research Design.

" Research design is the plan, structure and strategy of investigation conceived so as to obtain answer to research questions and to control variance" (F.N. Kerlinger, 1986 p-275).

The plan is the over all scheme or program of research. It includes an outline of what the investigator will do from writing the hypothesis and their operational implications to the final analysis of data. The structure of research is more specific. It is the outline, the scheme and the Paradigm of the operations of the variables. Strategy includes the methods to be used to gather and to the entire.

The research design refers to the entire process of planning and carrying out research study. In order to conduct this study, descriptive cumulative analytical research design has been utilized mainly for conceptualization of the problem and to describe the risk and return involved in a common stock investment as well as correlation of returns between commercial banks. Whereas analytical research design has been adopted to analyzed the relation between risk and return. The study covers the five years period from the FY 2003/04 to 2007/08. It deals with the common stocks of commercial banks on the basis of available information.

## 3.3 Nature and sources of Data

The required data for the study are collected from the secondary sources. The necessary data and information have been collected from various sources covering the period of five year's from the website of NEPSE Ltd i.e. http://www.nepalstock.com. The others are also collected from the annual reports of selected companies and the annual reports of securities Board, NEPSE Ltd. etc.
that are provided by securities Board Nepal and NEPSE Ltd.

## 3.4 Population and Sample

Population of the study is all the listed commercial banks of Nepal. According to SEBO/Nepal; there are 26 commercial banks operating in Nepal and among them only 15 are listed in NEPSE namely:

| | NEPSE CODE NO |
|---|---|
| 1. NABIL Bank Ltd. | 102 |
| 2. Nepal Investment Bank Ltd. | 103 |

3. Standard Chartered Bank Ltd. 104
4. Himalayan Bank Ltd. 105
5. Nepal SBI Bank Ltd. 106
6. Everest Bank Ltd. 108
7. Bank of Kathmandu Ltd. 109
8. Nepal Industrial and Commercial Bank Ltd. 110
9. Machhapuchhre Bank Ltd. 111
10. Laxmi Bank Ltd. 112
11. Kumari Bank Ltd. 113
12. Siddhartha Bank Ltd. 116
13. development Credit Bank Ltd. 118
14. NMB Bank Ltd. 117
15. Kist Bank

Among all the listed commercial banks only five banks are taken as sample for study. i.e.

i NABIL Bank Ltd.
ii Nepal Investment Bank Ltd.
iii Standard Chartered Bank Ltd.
iv Himalayan Bank Ltd.
v Bank of Kathmandu Ltd.

## 3.5 Method of Data Analysis

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

### 3.5.1 Market Price of Stock (P)

One of the major data of this study is market price of stock. There are three price records available for stocks i.e. high, low and closing price of each year. Among all the prices of stocks, each year closing price has been taken as market price of stock, which has a specific time span of one year and the study has focused in annual basis.

### 3.5.2 Dividend (D)

Dividend is part of earnings that is distributed to the shareholders as a part of their investment; divided per share (DPS) means the amount available to shareholders for each stock. It is calculated by dividing total dividend amount by number of shares outstanding.

$$\text{DPS} = \frac{\text{The total amount of dividend paid}}{\text{Number of common stock outstanding}}$$

If a company declares only cash dividend, there is no problem to take dividend amount. But if company declares stock dividend (i.e. bonus share), the model developed to find out the total dividend amount is:

Total dividend amount= cash dividend + % of stock dividend* current year market price (MPS)

Where,

MPS= Market price per share

### 3.5.3 Earning (E)

Earning refer to the net income after taxes of the company,. Earning per share (EPS) is the result of net income after taxes if dividend by the outstanding number of common stocks. Symbolically, EPS can be expressed as follow:

$$\text{EPS} = \frac{\text{Net income after taxes}}{\text{Number of common stocks outstanding}}$$

### 3.5.4 Return on Common Stock Investment (R)

The return is the total gain or loss experienced on an investment over a given period of time. It is commonly measured as the change in value plus only cash distribution during the period and expressed as a percentage of beginning prices of investment value. Symbolically, return (R) can be expressed as follows;

$$R = \frac{(P_t - P_{t-1}) + D_1}{P_{t-1}}$$

Where,

R= Actual rate of return on common stock at time t.

$P_t$ = Price of stock at time t.

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

$D_t$ = Cash dividend received at time t.

### 3.5.5 Expected Return on Common Stock ( $\overline{R_j}$ )

This study also require finding out the expected return on the common stock investment. Usually this rate is obtained by arithmetic mean of the past years return.

Symbolically:

$$E(R_i) = \overline{R_j} = \frac{\sum R_j}{n}$$

Where, $\overline{R_j}$ = Expected rate of return.

n= number of years that the return is taken.

$\sum$ = Sign of summation

### 3.5.6 Standard deviation

It is a statistical measure of the variability of a distribution of return around its mean. It is the square root of the variance and measures the total risk of stock investment .

Symbolically;

$$\pm_j = \sqrt{\frac{\sum (R_j - \overline{R_j})^2}{n-1}}$$

Where,

$\pm_j$ = Standard deviation of return on stock j during the time period of n.

### 3.5.7 Coefficient of Variation (C.V.)

The Coefficient of variation (C.V.) is a measure of relative dispersion that is useful in comparing the risk of assets with expected returns. The higher the coefficient of variation, greater the risk. Symbolically C.V. can be expressed as;

$$C.V._j = \frac{\pm_j}{\overline{R_j}}$$

Where,

C.V.$_j$ = coefficient of Variation on stock j.

$\pm_j$ = Standard deviation of return on stock j.

$\overline{R_j}$ = Expected rate of return on stock j

### 3.5.8 Portfolio Return ( $\overline{R_j}$ )

Portfolio is a combination of two or more than two securities of assets and portfolio return is simply a weighted average of individual stock returns from which it formed. In case of two, it is expressed;

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

Where,

$\overline{R_p}$ = Expected return on Portfolio so stock A & B.

$W_A$ = weight of Stock A.

$W_B$ =Weight of Stock B.

$\overline{R_A}$ = Expected Return on Stock A.

$\overline{R_B}$ = Expected Return on Stock B.

And $W_A + W_B$ are always equal to one.

### 3.5.9 Portfolio risk ($\pm_P$):-

It is the measure of combined standard deviation of stocks held in portfolio with reference to individual stocks corresponding correlation contribution for case of two securities; it is expressed as;

$$\pm_P = \sqrt{W_A{}^2 \pm_A{}^2 + W_B{}^2 \pm_B{}^2 + 2W_A W_B \pm_A \pm_B r_{AB}}$$

Where,

$\pm_P$ = Portfolio risk

$W_A$ = Proportion of stock A held in portfolio

$W_B$ = Proportion of stock B held in portfolio

$\pm_A$ = Standard deviation of stock A

$\pm_B$ = Standard deviation of stock B

$r_{AB}$ = Correlation between stock A & B.

### 3.5.10 Risk Minimizing Portfolio ($W_A$)

It is the proportion of stock that will minimize the possible unsystematic risk. Symbolically Risk minimizing portfolio can be expressed as;

$$W_A = \frac{\pm_B^2 - Cov.(r_A r_B)}{\pm_A^2 + \pm_B^2 - 2Cov.(r_A r_B)}$$

Where,

$W_A$ =Weight of proportion of stock A that minimize the portfolio risk of stock A & B

$\pm_A$ = Standard deviation of stock A

$\pm_B$ = Standard deviation of stock B

$Cov.(r_A r_B)$ = Covariance of returns of A & B.

### 3.5.11 Beta ( )

It is an index of systematic risk. The systematic risk is the degree of sensitivity of stocks returns to market movements, which is also known as beta coefficient. It is a measure of variability of a securities rate of return in response to the volatility of the market rate of returns. Higher the beta, greater the sensitivity and relation to the market movement. Mathematically, beta is measured as;

$$_A = \frac{Cov.(r_A r_B)}{\pm_m^2}$$

Where,

$_A$ = Beta coefficient of stock A

$Cov.(r_A r_B)$ = Covariance between the return of stock A and market.

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

### 3.5.12 Portfolio Beta( $_P$ )

The beta of portfolio can be easily estimated using data of the individual assets it includes. Symbolically, portfolio beta coefficient can be expressed as follows:

$$_P = \sum_{i=1}^{n} w_1 \quad _1$$

Where,

$_P$ = Portfolio beta coefficient.

$w_1$ =Proportion of the total rupees value represented by assets.

$_1$ = Beta coefficient of assets.

### 3.5.13 Correlation coefficient (r)

Correlation is a statistical measure of the relationship. Two variables are said to be correlated when they are so related that the change in the value of one variable in accompanied by the change in the value of other. The degree of correlation coefficient, which ranges from +1 for perfectly correlated to -1 perfectly negatively correlated series. Symbolically, it is expressed as;

$$\pm_{xy} = \frac{Cov.(r_x r_y)}{\pm_x \pm_y}$$

Where,

$\pm_{xy}$ = Correlation coefficient for assets x and y.

$Cov.(r_x r_y)$ = Covariance between assets x and y.

### 3.5.14 Construction of the optimal portfolio (Sharpe-Single Index Model).

The desirability of any securities is directly related to its excess return to beta ratio. i.e.

$$(\overline{R}_i - T)/ \quad _{im}$$

Where,

$\overline{R}_i$ = The expected return on security i.

$_{im}$ = The expected change in the rate of return on security I associated with a one percent change in the market return.

T= The return on a risk less asset.

If securities are ranked by excess return to beta (from highest to lowest), the ranking represents the desirability of any securities inclusion in a portfolio. The number of securities selected depends on a unique cut-off rate such that all securities with higher ration of $(\overline{R}_i - T)$ will be included and all securities with lower rates excluded.

To determine which securities are included in the optimum portfolio, the following steps are necessary;

(i) Calculate the "excess return to beta" ratio for each security under review and rank from higher to lower.

(ii) The optimum portfolio consists of investing in all securities for which $(\overline{R}_i - T)/_{im}$ is greater than a particular cut-off C*.

For calculating C*, we use the formula as;

$$C_i = \frac{\pm_m^2 \sum_{i=1}^{i} \frac{(\overline{R_i} - T)/_{im}}{\pm_{ei}^2}}{1 + \pm_m^2 \sum_{i=1}^{i} \frac{im}{\pm_{ei}^2}}$$

Where,

$\pm_m^2$ = variance of the market index.

$\pm_{ei}^2$ = Variance of a securities movement that is not associated with the movement of the market index; this is the securities unsystematic risk.

To construct the portfolio, the percent invested for each selected security in the optimal portfolio is to calculated. The percentage invested in each securities is;

$$X_i^{\,0} = \frac{Z_i}{\sum_{i=1}^{n} Z_i}$$

Where,

$$Z_i = \frac{im}{\pm\, {}_{ei}^{\,2}}\left[\frac{\overline{R}_i - T}{im} - C^*\right]$$

The second expression determines the relative investment in each security, and the first expression simply scales the weights on each security so that they sum to I (ensure full investment).

### 3.5.15 Test of Significance

### (A) Test of Significance for a single mean

To test the significance of model as well as variables as we use t-test for a single mean. It is a applied for hypothesis testing first to test whether there is any significant difference between average mean for commercial bank with market portfolio on net. If the test is "test of significance for a single mean," the test statistical (t) is given by,

Symbolically,

$$t = \frac{\overline{x} - «}{\frac{S}{\sqrt{n}}}$$

Where,

T= Student's t-test statistics

$\overline{x}$ = Arithmetic mean of sample Statistics

« = Arithmetic mean of population statistics

S= Standard deviation of population parameter.

Test result; if t-calculated value ≤ t- tabulated value, accept the null hypothesis or vice-versa.

### (B) ANOVA in one-way classification

In one way classification, the effect of anyone factor is taken into consideration. There are so many methods to compute f-test, short cut method of computing F-ratio is desirable to use and steps are as follows:

a. Find the sum of the values of all the items of all the samples and denotes it by T.
b. Calculate the correlation factor i.e. $T^2/N$
   Where,
   N= total number of items of all the sample
c. Find the square of all the items of all the samples and add them together.
d. Find out the total sum of squares (SST) by subtracting $T^2/N$ from the sum of squares of all the items of the samples.
e. Find out the sum of squares between the samples (SSC) by subtracting $T^2/N$ from the sum of the square of the total dividend by the number of items in in each sample.
f. Find the sum of square within samples (SSE) by using SSE=SST-SSC
g. Prepare ANOVA table to compute F

ANOVA-Table

| Source of variable | Sum of squares | Degree of freedom | Mean sum of squares | f-ratio |
|---|---|---|---|---|
| Between samples | SSC | C-1 | MSC= $\frac{SSC}{C-1}$ | F= $\frac{MSC}{MSE}$ |
| Within samples | SSE | N-C=(N-1)(N-C) | MSE= $\frac{SSE}{D.F.(N-C)}$ | |
| Total | SST=SSC+SSE | N-1 | | |

h. Make decision. If the computed value of F is less than its critical value, $H_0$ is accepted otherwise $H_1$ is accepted.

## 3.6 Method of Analysis and Presentation

All the methods of analysis and presentation are applied as simple as possible. Proper financial and statistical tools are used and results are presented in tables and also shown in diagram too. Interpretation is made in very simple way. Details of calculation which couldn't be shown in the main body part are presented in Appendices, at the end. Summary, conclusion and recommendation are presented finally.

# CHAPTER-4

## Data Presentation and Analysis

This chapter is the main body of the study which includes all the collected data and their interpretation. Detail data of MPS and dividend of each bank and NEPSE index of each industry is presented and their interpretation and analysis is done. With reference to various readings and literature review in the preceding chapter, effort is made to analyze and diagnose the recent Nepalese Stock Market movement, with a special reference to Commercial Banks. Different tables and diagrams are used to make the result more simple and clear.

### 4.1 Analysis of Commercial Banks

As the study has taken a special reference to listed Commercial Banks, 26 Commercial Banks is operationed in Nepal but only 15 of them are listed in NEPSE and among those 15 Commercial Banks only five Banks have been taken for study. The data coverage stocks risk and returns are analyzed in this chapter.

#### 4.1.1 Nepal Arab Bank Limited (NABIL)

This bank was established in the year 1984 A.D. (2041 B.S.) and listed in NEPSE in the year 1986 A.D. (08/09/042 B.S.) in the year 2004 A.D., Authorized capital, Issued capital and Paid –Up capita of NABIL are Rs.500000000., Rs.491654400. and Rs.491654400. respectively. The Par value per share is Rs.100 and number of shareholders are 5076.

Market Price per share, Dividend records, EPS and P/E ratio of Common Stock of NABIL are shown in table no 4.1.

**Table 4.1: MPS, Dividend, and EPS and P/E ratio of NABIL**

| Fiscal year | Closing MPS (Rs.) | Dividend per share | | | | EPS (Rs.) | P/E ratio |
|---|---|---|---|---|---|---|---|
| | | Cash dividend (Rs.) | Stock dividend | Stock Dividend (Rs.) | Total dividend (Rs.) | | |
| 2003/04 | 1000 | 65 | 0% | 0 | 65 | 92.61 | 10.8 |
| 2004/05 | 1505 | 70 | 0% | 0 | 70 | 105.49 | 14.27 |
| 2005/06 | 2240 | 85 | 0% | 0 | 85 | 121.21 | 17.34 |
| 2006/07 | 5050 | 100 | 40% | 2020 | 2120 | 137.08 | 36.84 |
| 2007/08 | 5275 | 60 | 40% | 2110 | 2170 | 108.31 | 48.7 |

Data source: Annual report of nabil bank Limited.

From the above table, the P/E ratio NABIL is maximum in year 2007/08 and minimum in year 2003/04. The closing price is maximum in the year 2007/08 and minimum in the year 2003/04 respectively. In the same way, EPS is maximum in year 2006/07 and minimum in year 2003/04. The cash dividend is distributed in all the year and it is maximum is year 2006/07 and minimum in year 2007/08. The stock dividend is provided in the year 2006/07 and 2007/08 in the ratio of 5:2

Diagram 4.1:- year end price movement of NABIL

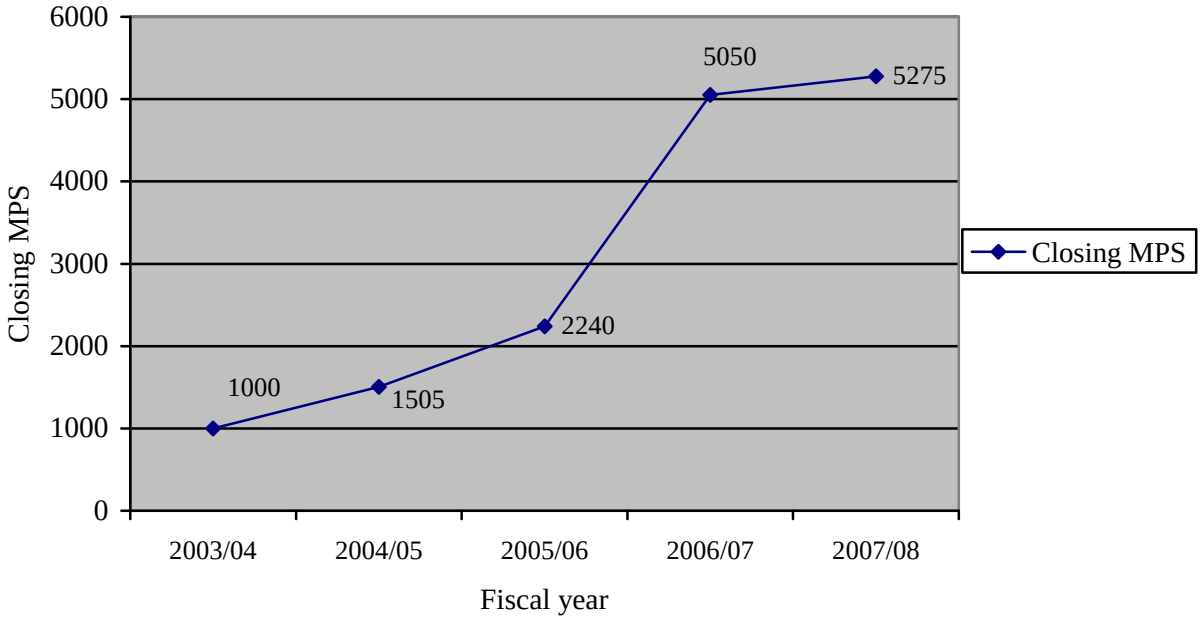



**Table 4.2: Expected Return, S.D. and C.V. of C.S. of NABIL**.

| Fiscal Year | Closing Market Price (Pt) | Total Dividend (Dt) | Yearly Return $R_j = \frac{(Pt-Pt-1) + Dt}{Pt-1} \times 100\%$ | $R_j-\overline{R}_j$ | $(R_j-\overline{R}_j)^2$ |
|---|---|---|---|---|---|
| 2002/03 | 735 | - | - | - | - |
| 2003/04 | Rs 1000 | Rs 65 | 44.898% | -39.962 | 1596.96 |
| 2004/05 | Rs 1505 | Rs 70 | 57.5% | -27.36 | 748.57 |
| 2005/06 | Rs 2240 | Rs 85 | 54.485% | -30.375 | 922.638 |
| 2006/07 | Rs 5050 | Rs 2120 | 220.134% | 135.274 | 18299 |
| 2007/08 | Rs 5275 | Rs 2170 | 47.3267% | -37.533 | 1408.75 |
| N=5 | | | $\Sigma R_j$ = 424.3437% | $\sum(R_j - \overline{R_j})^2$=22976 | |

We have,

Expected return ($\bar{R}$)= $\frac{\sum(R_j)}{n}$

=424.34/5

=84.86%

Standard deviation ($\pm$ )= $\sqrt{\frac{\sum(R_j - R_j)^2}{n-1}}$

= $\sqrt{(22976/4)}$

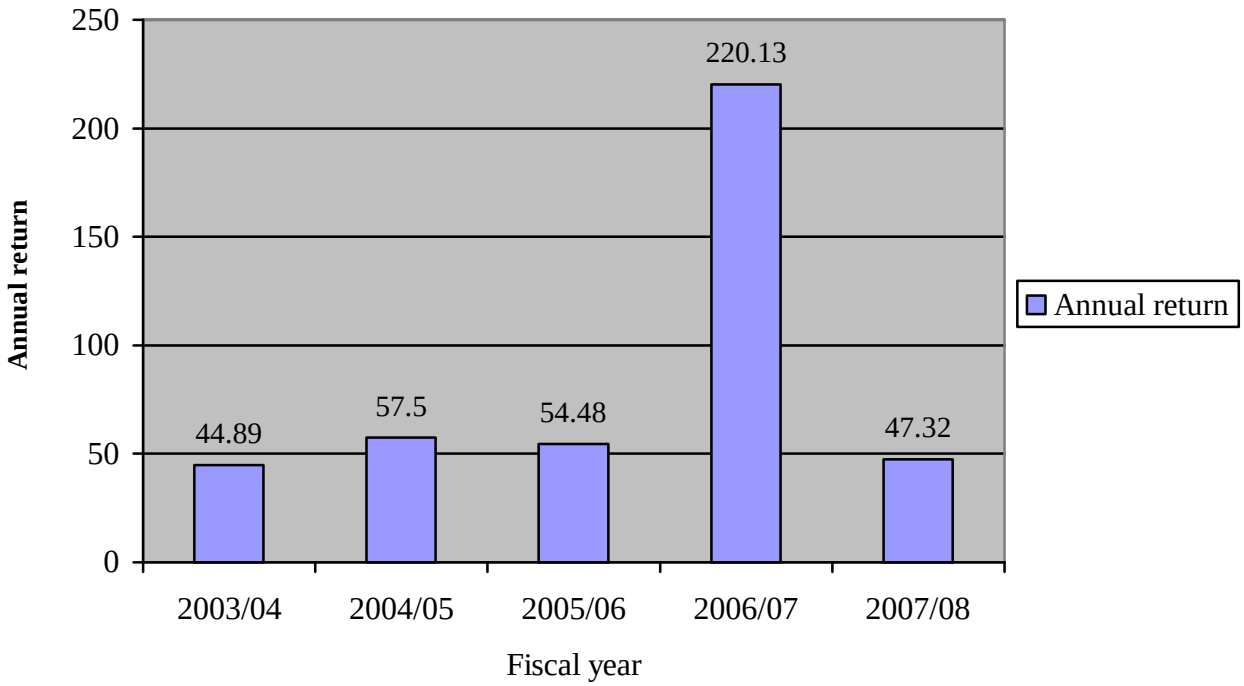
=75.78%

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

= 75.78/84.86

= 89.30%

Diagram 4.2:- Annual return of common stock of NABIL



The rate of return of the share of NABIL is maximum in year 2006/07 and minimum in year 2003/04. The rate of return is tends to increase and again decreases in the final year. The rate of return is slightly fluctuating in the middle of the year.

The expected rate of return for NABIL is 84.86%, the standard deviation is 75.78% and the C.V. for NABIL's stock is 89.30%.

## 4.12. Nepal Investment Bank Limited ( NIBL.)

This Bank was established in the year 1985 A.D., Authorized capital, Issued Capital and Paid- Up capital of NIBL are Rs.590000000, Rs.295293000 and Rs.295293000 respectively. The par value per share of NIBL is Rs.100 and number of shareholders are 2780.

Market price of Stock, Dividend, EPS and P/E ratio of Common Stock of NIBL are shown in table 4.3.

**Table 4.3: MPS, Dividend, and EPS and P/E ratio of NIBL.**

| Fiscal year | Closing MPS (Rs.) | Dividend per share | | | | EPS (Rs.) | P/E ratio |
|---|---|---|---|---|---|---|---|
| | | Cash dividend (Rs.) | Stock dividend | Stock dividend (Rs.) | Total dividend (Rs.) | | |
| 2003/04 | 940 | 15 | 0 % | 0 | 15 | 51.70 | 18.18 |
| 2004/05 | 800 | 12.5 | 0 % | 0 | 12.5 | 39.50 | 20.25 |
| 2005/06 | 1260 | 20 | 35.46 % | 447 | 467 | 59.35 | 21.23 |
| 2006/07 | 1729 | 5 | 25 % | 432.2 | 437.2 | 62.57 | 27.63 |
| 2007/08 | 2450 | 7.5 | 33.33 % | 816.6 | 824 | 57.87 | 42.33 |

Data source: Annual report of Nepal Investment bank Limited.

In the given table 4.3; the closing MPS is maximum in year 2007/08 and minimum in year 2004/05. The EPS is also maximum in year 2006/07 and minimum in year 2004/05. The P/E ratio is maximum in year 2007/08 and minimum in year 2003/04.The cash

dividend is maximum in year 2005/06 and also stock dividend is maximum in that year. The cash dividend is distributed in all the year. The total dividend is highest in the year 2007/08 due to the maximum closing price of stock.. NIBL is provided stock dividend in the respective three years.

Diagram 4.3:- Closing MPS movement of NIBL

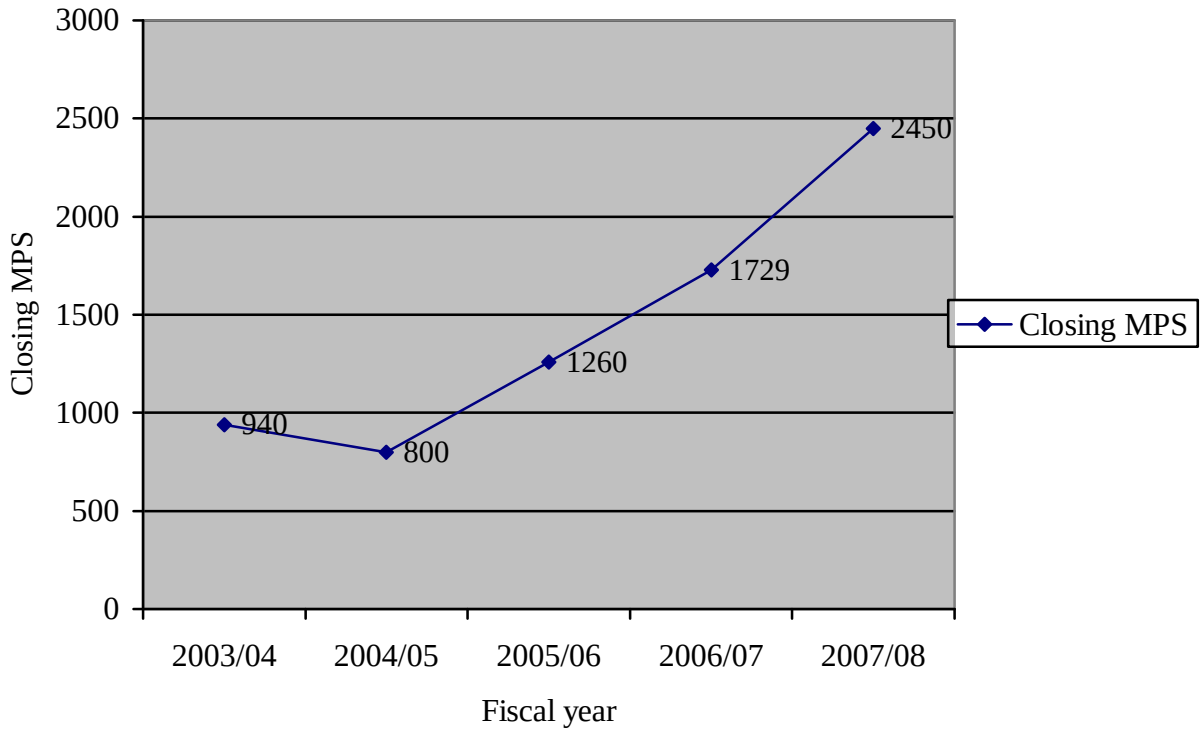



**Table 4.4: Expected Return, S.D. and C.V. of C.S. of NIBL.**

| Fiscal Year | Closing Market Price (Pt) | Total Dividend (Dt) | Yearly Return $R_j = \frac{(Pt-Pt-1) + Dt}{Pt-1} \times 100\%$ | $R_j-\overline{R}_j$ | $(R_j-\overline{R}_j)^2$ |
|---|---|---|---|---|---|
| 2002/03 | Rs.795 | - | - | - | - |
| 2003/04 | Rs.940 | Rs.15 | 20.12579% | -36.6142 | 1340.601 |
| 2004/05 | Rs.800 | Rs .12.5 | -13.5638% | -70.3038 | 4942.628 |

| | | | | | |
|---|---|---|---|---|---|
| 2005/06 | Rs.1260 | Rs.467 | 115.875% | 59.135 | 3496.948 |
| 2006/07 | Rs.1729 | Rs.437.2 | 71.92063% | 15.18063 | 230.4517 |
| 2007/08 | Rs.2450 | Rs.824 | 89.35801% | 32.61801 | 1063.935 |
| N=5 | | | $\Sigma R_j$ = 283.71563% | $\sum (R_j - \overline{R_j})^2$ =11074.56 | |

We have,

Expected return ($\overline{R}$)= $\frac{\sum (R_j)}{n}$

=283.71/5

=56.74%

Standard deviation ($\pm$ )= $\sqrt{\frac{\sum (R_j - R_j)^2}{n-1}}$

= $\sqrt{(11074.56/4)}$

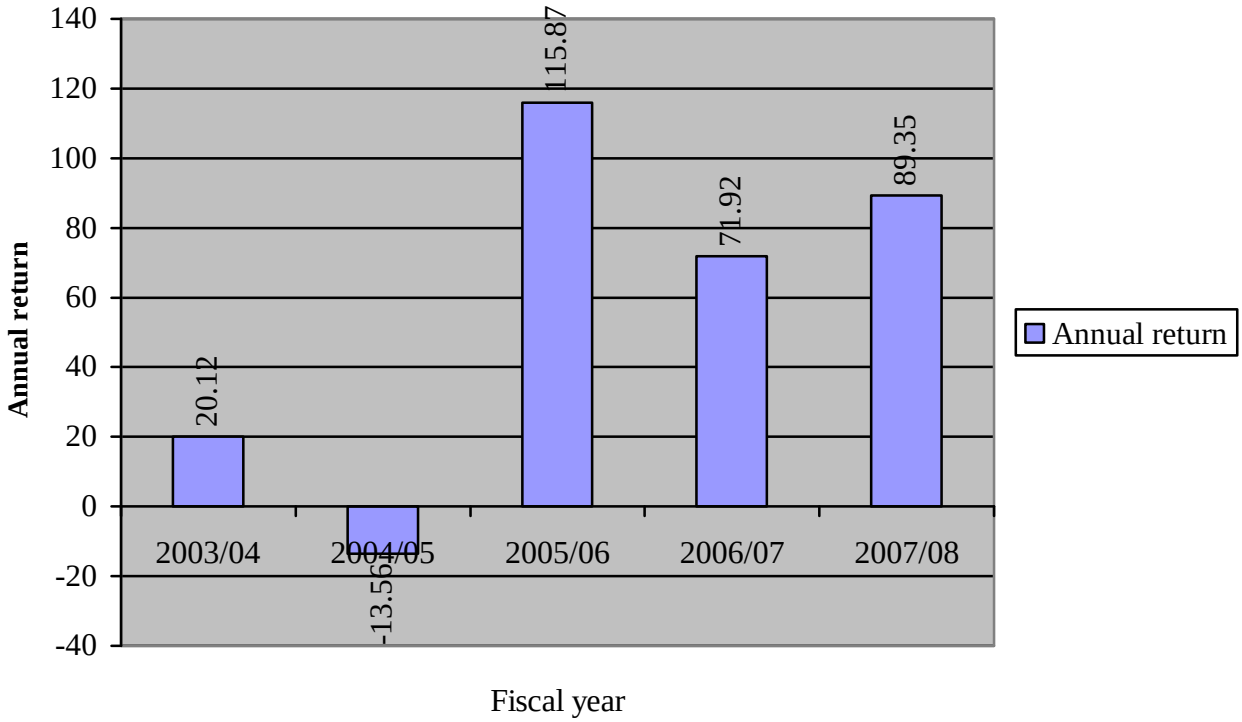
=52.62%

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

= 52.62/56.74

= 93.73%

Diagram 4.4:- Annual rate of return of C.S. of NIBL




The return of the share of NIBL is minimum in year 2003/04 and maximum in year 2005/06. The returns is decreasing and even go in negative side in year 2004/05 and then increasing in 205/06 and again decreasing then after. In the current year 2007/08 the return is 89.35% which is maximum than previous year.

The Expected return for NIBL's stock is 56.74%, the standard deviation is 52.62% and C.V. for NIBL's is 93.73%.

### 4.1.3 Standard Chartered Bank Limited (SCBL)

This bank was established in year 1985 A.D. (2040 B.S.) and listed in NEPSE in the year 1988 A.D. (03/21/2045 B.S.). In the year 2004, Authorized Capital, Issued Capital and Paid up Capital of SCBL are Rs.1000000000, Rs.5000000000 and Rs.374674640400 respectively. The par value per share is Rs.100 and Number of shareholders are 5037.

Market price of Stock, Dividend, EPS and P/E ratio of Common Stock of SCBNL are shown in table 4.5

**Table 4.5: MPS, Dividend, EPS and P/E ratio of SCBL.**

| Fiscal year | Closing MPS (Rs.) | Dividend per share | | | | EPS | P/E ratio |
|---|---|---|---|---|---|---|---|
| | | Cash dividend (Rs.) | Stock dividend | Stock dividend (Rs.) | Total dividend (Rs.) | | |
| 2003/04 | 1745 | 110 | 0% | 0 | 110 | 143.55 | 12.16 |
| 2004/05 | 2345 | 120 | 0% | 0 | 120 | 143.14 | 16.38 |
| 2005/06 | 3775 | 130 | 10% | 377.5 | 507.5 | 175.84 | 21.47 |
| 2006/07 | 5900 | 80 | 50% | 2950 | 3030 | 167.37 | 35.25 |
| 2007/08 | 6830 | 80 | 50% | 3415 | 3495 | 131.92 | 51.77 |

(Source: Annual Report of SCBL)

In the above table, the MPS is maximum in the year 2007/08 and minimum in year 2003/04. The MPS are increasing continuously up to 2007/08. The EPS is maximum in year 2005/06 and minimum in year 2004/05. The EPS is not continuously increasing over the year, it is slightly fluctuating in the middle of the year. The P/E ratio is maximum in year 2007/08 and minimum in year 2003/04. The cash dividend is maximum in the year 2005/06 and it is almost highest in the previous year than the current two year. It is distributed in all the year of the study.

Diagram 4.5:- Closing MPS movement of SCBL

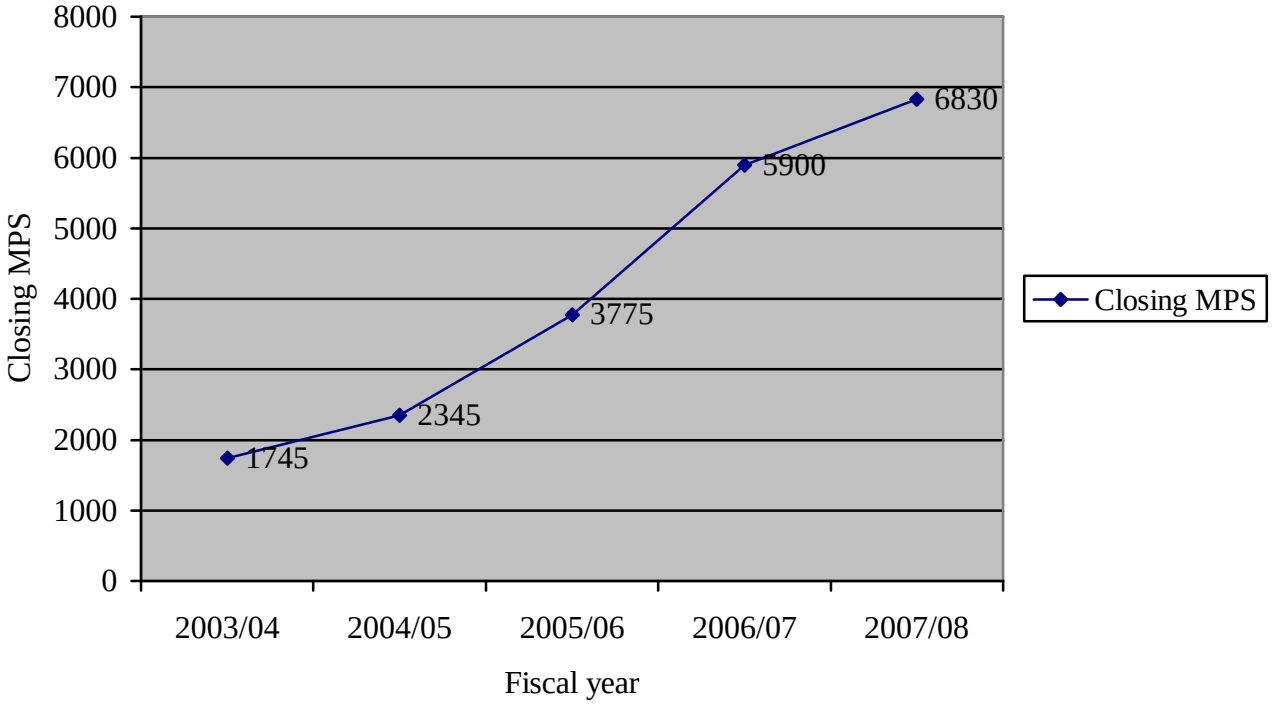



**Table 4.6: Expected Return, S.D. and C.V. of C.S. of SCBL**.

| Fiscal Year | Closing Market Price (Pt) | Total Dividend (Dt) | Yearly Return $R_j = \frac{(Pt-Pt-1)+Dt}{Pt-1} \times 100\%$ | $R_j-\overline{R}_j$ | $(R_j-\overline{R}_j)^2$ |
|---|---|---|---|---|---|
| 2002/03 | Rs.1640 | - | - | - | - |
| 2003/04 | Rs.1745 | Rs.110 | 13.1098 | -56.6 | 3203.59 |
| 2004/05 | Rs.2345 | Rs.120 | 41.2607 | -28.449 | 809.36 |
| 2005/06 | Rs.3775 | Rs.507.5 | 82.6226 | 12.9126 | 166.735 |
| 2006/07 | Rs.5900 | Rs.3030 | 136.556 | 66.8463 | 4468.43 |
| 2007/08 | Rs.6830 | Rs.3495 | 75 | 5.29 | 27.9841 |
| N=5 | | | $\Sigma R_j = 348.5491$ | $\sum(R_j-\overline{R_j})^2 = 8676.10$ | |

We have,

Expected return $(\bar{R}) = \frac{\sum(R_j)}{n}$

=348.54/5

=69.71%

Standard deviation $(\pm) = \sqrt{\frac{\sum(R_j - \bar{R}_j)^2}{n-1}}$

$= \sqrt{(8676.1/4)}$

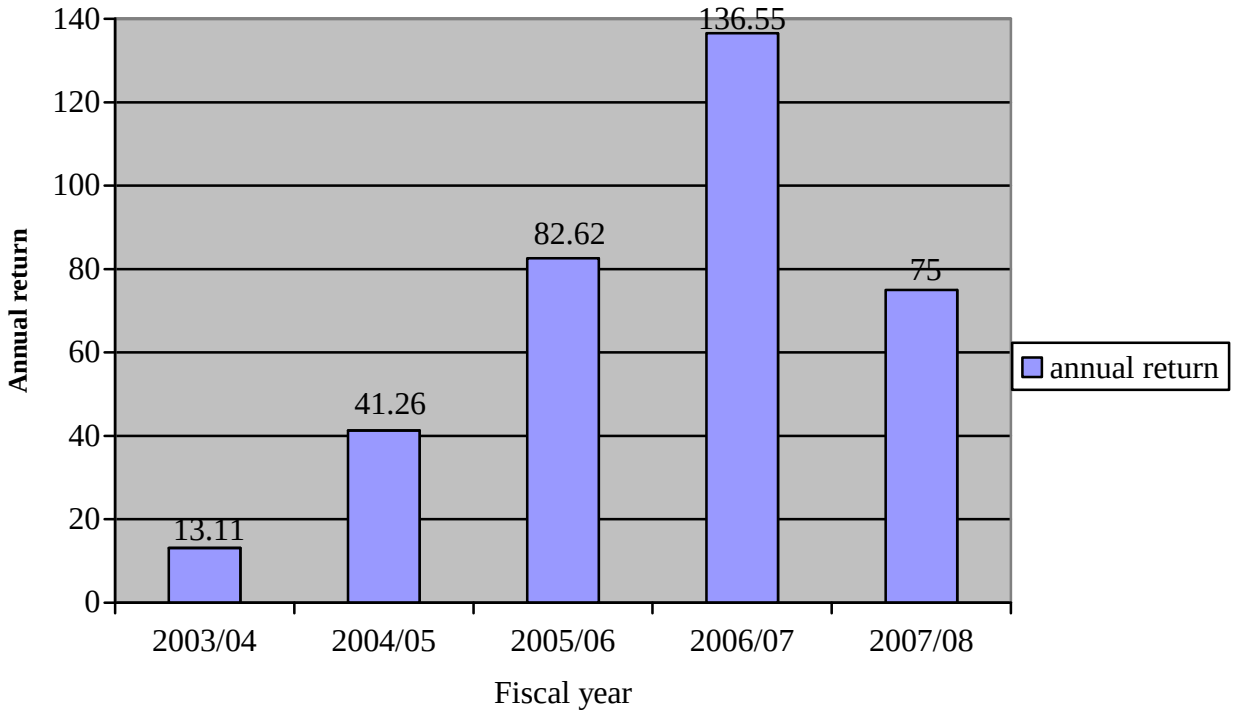
=46.57%

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

= 46.57/69.71

=66.81%

Diaagram 4.6:- Annual report of C.S. of SCBL



The rate of return is maximum in year 2006/07 and minimum in year 2003/04. The rate of return is increasing continuously up to year 2006/07 and theater decreases in year 2007/08. The rate of return is highest in year 2006/07 among all the year.

The expected return for SCBL's stock is 69.71%, the standard deviation is 46.57% and the C.V. for the SCBL's stock is 66.81%.

### 4.1.4 Himalayan Bank Limited (HBL)

Himalayan Bank was established in 1993 in joint venture with Habib Bank Limited of Pakistan. Despite the cut-throat competition in the Nepalese Banking sector, Himalayan Bank has been able to maintain a lead in the primary banking activities- Loan and Deposits. Products such as Premium Savings Account, HBL Proprietary Card and Millionaire Deposit Scheme besides services such as ATMs and Tele-banking were first introduced by HBL. The Himalayan bank limited is listed in NEPSE in year 1993. The par value per share of HBL is Rs.100.

Market price of Stock, Dividend, EPS and P/E ratio of HBL are shown in table 4.7.

**Table:- MPS, Dividend, EPS and P/E ratio of HBL**

| Fiscal year | Closing MPS (Rs.) | Dividend per share | | | | EPS (Rs.) | P/E ratio |
|---|---|---|---|---|---|---|---|
| | | Cash dividend (Rs.) | Stock dividend | Stock Dividend (Rs.) | Total dividend (Rs.) | | |
| 2003/04 | 840 | 0 | 20 % | 168 | 168 | 49.05 | 17.12 |
| 2004/05 | 920 | 11.58 | 20 % | 184 | 195.58 | 47.91 | 19.20 |
| 2005/06 | 1100 | 30 | 5 % | 55 | 85 | 59.24 | 18.57 |
| 2006/07 | 1740 | 15 | 25 % | 435 | 450 | 60.66 | 28.69 |
| 2007/08 | 1980 | 25 | 20 % | 396 | 421 | 62.74 | 31.56 |

(source:- Annual report of HBL bank limited)

In the above table, the MPS is maximum in year 2007/08 and minimum in year 2003/04. The MPS are increasing continuously over the year. The EPS is also maximum is year 2007/08 and minimum in year 2004/05. The EPS is increasing over the year except in year 2004/05, in this year EPS is slightly decreasing. The P/E ratio is

maximum in year 2007/08 and minimum in year 2003/04. The total dividend is highest in the year 2006/07 due to the highest MPS and Stock dividend. The cash dividend is highest in year 2005/06.

Diagram 4.7:- Year end MPS movement of HBL

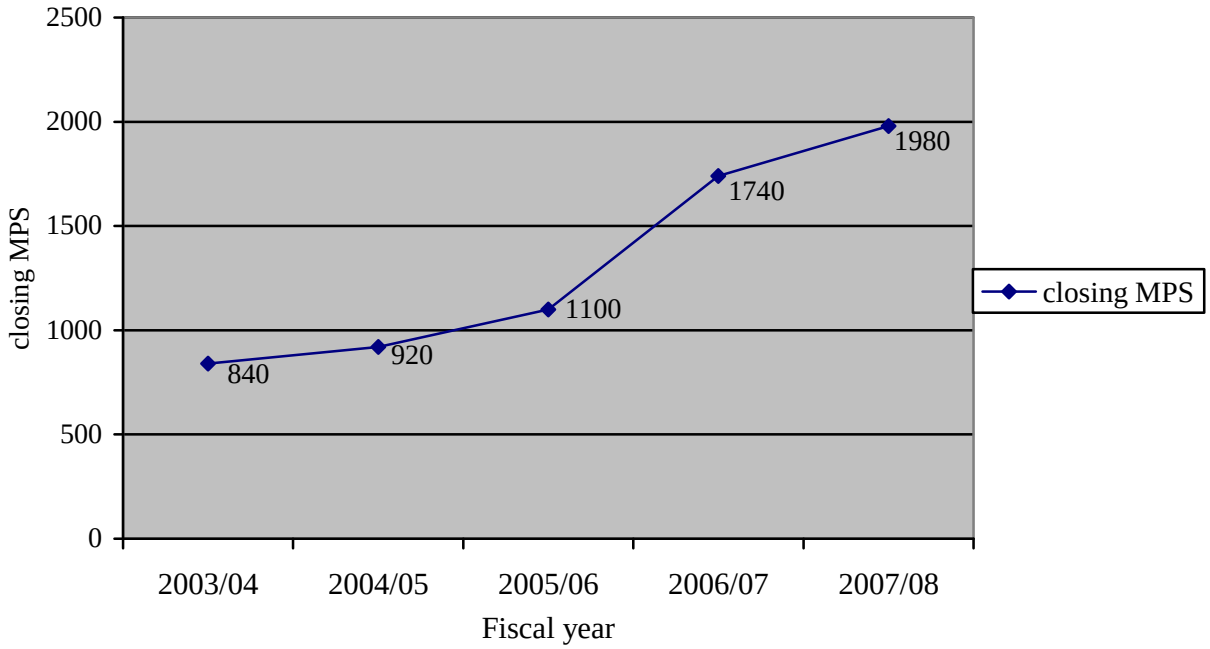



**Table 4.8:- Expected Return, S.D. and C.V. of C.S. of HBL**.

| Fiscal Year | Closing Market Price (Pt) | Total Dividend (Dt) | Yearly Return $R_j = \frac{(Pt-Pt-1) + Dt}{Pt-1} \times 100\%$ | $R_j-\overline{R}_j$ | $(R_j-\overline{R}_j)^2$ |
|---|---|---|---|---|---|
| 2002/03 | 836 | - | - | - | - |
| 2003/04 | Rs 840 | Rs 168 | 20.2153% | -23.565 | 555.295 |
| 2004/05 | Rs 920 | Rs 195.58 | 32.8071% | -10.973 | 120.404 |
| 2005/06 | Rs 1100 | Rs 85 | 28.8043% | -14.976 | 224.27 |
| 2006/07 | Rs 1740 | Rs 450 | 99.0909% | 55.3109 | 3059.3 |
| 2007/08 | Rs 1980 | Rs 421 | 37.9885% | -5.7915 | 33.5414 |
| N=5 | | | $\Sigma R_j$ = 218.9061% | $\sum(R_j - \overline{R}_j)^2$ =3992.8 | |

We have,

$$\text{Expected return } (\bar{R}) = \frac{\sum (R_j)}{n}$$

$$= 218.90/5$$

$$= 43.78\%$$

$$\text{Standard deviation } (\pm) = \sqrt{\frac{\sum (R_j - \bar{R}_j)^2}{n-1}}$$

$$= \sqrt{(3992.8/4)}$$

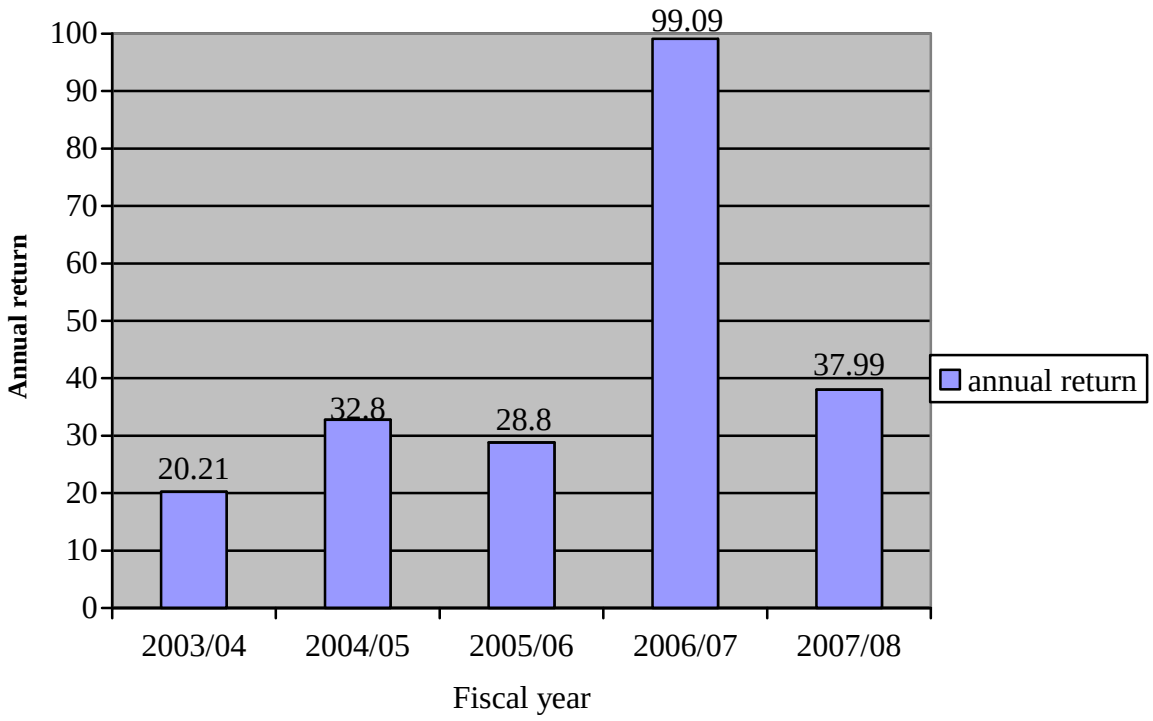
$$= 31.60\%$$

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

$$= 31.60/43.78$$

$$= 72.16\%$$

Diagram 4.8:- Annual return of C.S. of HBL




The annual return of HBL is maximum is year 2006/07 and minimum in year 2003/04. In the five years of study period the annual return of HBL is not constantly growing, it is slightly decreasing in the middle of the years. The expected return for HBL's stock is 43.78%, the standard deviation is 31.60% and the C.V. of HBL is 72.16%.

### 4.1.5 Bank of Kathmandu Limited (BOKL)

This Bank was established in the year a1994 A.D. (2040 B.S.) and listed in NEPSE in year 1998 A.D. (04/02/054). In this period, the Authorized Capital, Issued Capital and Paid up Capital of BOKL are Rs.1000000000, Rs.500000000 and Rs.463580900 respectively. The par value per share is Rs.100 and number of the shareholders of BOKL are 23316.

The market price of Stock, Dividend, EPS and P/E ratio of common stocks of Bank of Kathmandu are shown in table 4.9.

**Table 4.9: MPS, Dividends, EPS and P/E ratio of BOKL.**

| Fiscal year | Closing MPS (Rs.) | Dividend per share | | | | EPS (Rs.) | P/E ratio |
|---|---|---|---|---|---|---|---|
| | | Cash dividend (Rs.) | Stock dividend | Stock Dividend (Rs.) | Total dividend (Rs.) | | |
| 2003/04 | 295 | 10 | 0 % | 0 | 10 | 27.5 | 7.20 |
| 2004/05 | 430 | 15 | 0 % | 0 | 15 | 30.1 | 14.29 |
| 2005/06 | 850 | 18 | 30 % | 255 | 273 | 43.67 | 19.46 |
| 2006/07 | 1375 | 20 | 0 % | 0 | 20 | 43.5 | 31.61 |
| 2007/08 | 2350 | 2.11 | 40 % | 940 | 942.11 | 59.94 | 39.21 |

(source:- Annual report of Bank of Kathmandu Limited)

In the above table, the MPS is maximum in the year 2007/08 and minimum in initial year of the study 2003/04. The trend of MPS is increasing in the upward direction. The EPS is maximum in the current year 2007/08 and minimum in the initial year of the study 2003/04. The EPS is increasing up to the current year without fluctuation over the year except year 2006/07. The P/E ratio is maximum in the year 2007/08 and minimum in year 2003/04. The trend of P/E ratio is increasing over the year. The cash dividend is distributed in all the year and maximum in year 2006/07. The bank has distributed stock dividend during the observed period is two times in year 2005/06 and 2007/08. The total dividend is maximum in year 2007/08 due to the highest MPS and Stock dividend.

Diagram 4.9:- Year end MPS movement of BOKL

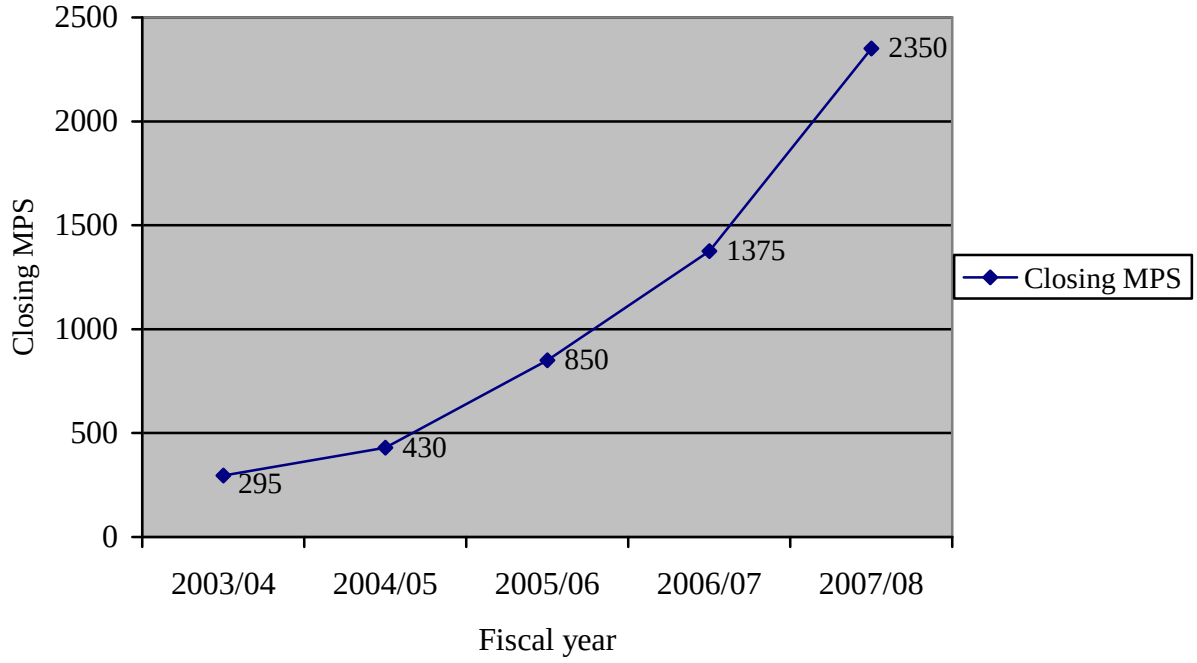



**Table 4.10: Expected Return, S.D. and C.V. of C.S. of BOKL.**

| Fiscal year | Closing Market Price (Pt) | Total Dividend (Dt) | Yearly Return $R_j = \frac{(Pt-Pt-1) + Dt}{Pt-1} \times 100\%$ | $R_j-\overline{R_j}$ | $(R_j-\overline{R_j})^2$ |
|---|---|---|---|---|---|
| 059/060 | 198 | - | - | - | - |
| 060/061 | Rs 295 | Rs 10 | 54.0404% | -39.88 | 1590.38 |
| 061/062 | Rs 430 | Rs 15 | 50.8475% | -43.073 | 1855.24 |
| 062/063 | Rs 850 | Rs 273 | 161.163% | 67.2428 | 4521.59 |
| 063/064 | Rs 1375 | Rs 20 | 64.1176% | -29.802 | 888.18 |
| 064/065 | Rs 2350 | Rs.942.11 | 139.426% | 45.5062 | 2070.81 |
| N=5 | | | $\Sigma R_j$ = 469.5945% | $\sum (R_j - \overline{R_j})^2$ =10926.2 | |

We have,

Expected return ($\bar{R}$) = $\frac{\sum(R_j)}{n}$

=469.59/5

=93.92%

Standard deviation ($\pm$) = $\sqrt{\frac{\sum(R_j - \bar{R}_j)^2}{n-1}}$

= $\sqrt{(10926.2/4)}$

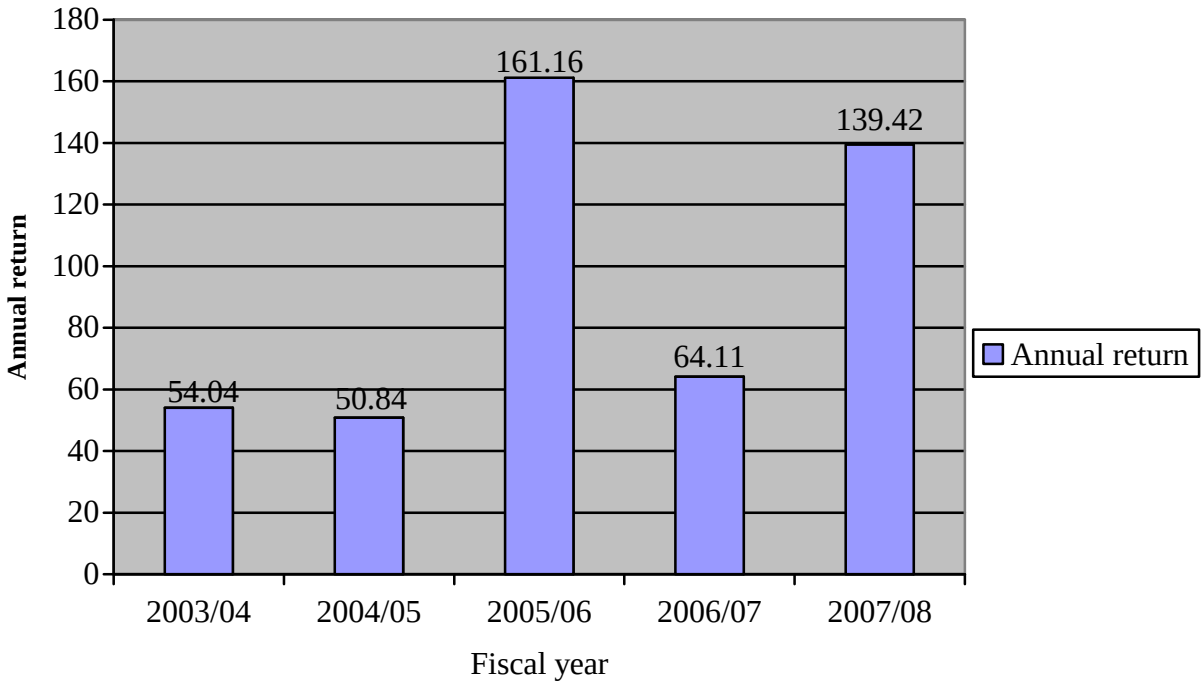
=52.26%

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

= 52.26/93.92

= 55.64%

Diagram 4.10:- Annual return of C.S. of BOKL




The annual return of BOKL is maximum in the year 2005/06 and minimum in year 2004/05. The return is not increasing smoothly over the period. It is fluctuating in the middle of the year.

The expected return for BOKL's stock is 93.92%, the standard deviation is 52.26% and the C.V. of BOKL's stock is 55.64%.

**4..2 Inter-Bank Comparison**

According to the result from Analysis part, A comparative analysis of return, total risk and risk per unit is performed here. Expected return, standard deviation and coefficient of variation of each bank for the period 2003/04 to 2007/08 are given in the Table no. 4.11.

**Table 4.11: Expected Return, Standard Deviation and C.V. of selected five Commercial Banks.**

| S.N. | Bank | Expected | Standard | Coefficient | Remark |
|---|---|---|---|---|---|

| | | return Avg(R) | deviation (± ) | of variation (C.V.) | Return | Risk | C.V. |
|---|---|---|---|---|---|---|---|
| 1 | NABIL | 84.86 | 75.78 | 89.30 | | Highest | |
| 2 | NIBL | 56.74 | 52.62 | 92.73 | | | Highest |
| 3 | SCBL | 69.71 | 46.57 | 66.81 | | | |
| 4 | HBL | 43.78 | 31.60 | 72.16 | Lowest | Lowest | |
| 5 | BOKL | 93.92 | 52.26 | 55.64 | Highest | | Lowest |

The table shows that the expected rate of return of BOKL is comparatively highest than other commercial banks. Coefficient of Variation of BOKL is lowest than the other banks. A ranking of lowest C.V. is said to be more consistent than others. The table shows that the return of HBL is lowest among all of the banks and the risk is also minimum than other banks. This shows that higher the risk, highest the return and lower the risk, lowest the return. The risk of NABIL is maximum so that return of NABIL is also somewhat highest. The HBL have lower return because of lower risk. The C.V. of NIBL is maximum, this shows that the risk per unit is highest. The NIBL has borne maximum risk to get some return. Similarly, the C.V. of BOKL is minimum; this shows that the risk per unit is lowest. The BOKL has borne minimum risk to get some return. From above table we see that higher CV., higher the risk and lower the C.V., lower the risk. From above description we conclude that the investment in BOKL is desirable on the basis of return because its one period return is higher than of others and by taking decision on the basis of the C.V., BOKL's is the best securities for investment because its C.V. is lowest among all. Similarly, on the

basis of risk the investment on NABIL is favorable because it is risky than other securities. The securities having higher risk may be gives higher return.

**Diagram 4.11:- Expected return, S.D. and C.V. of five commercial banks**

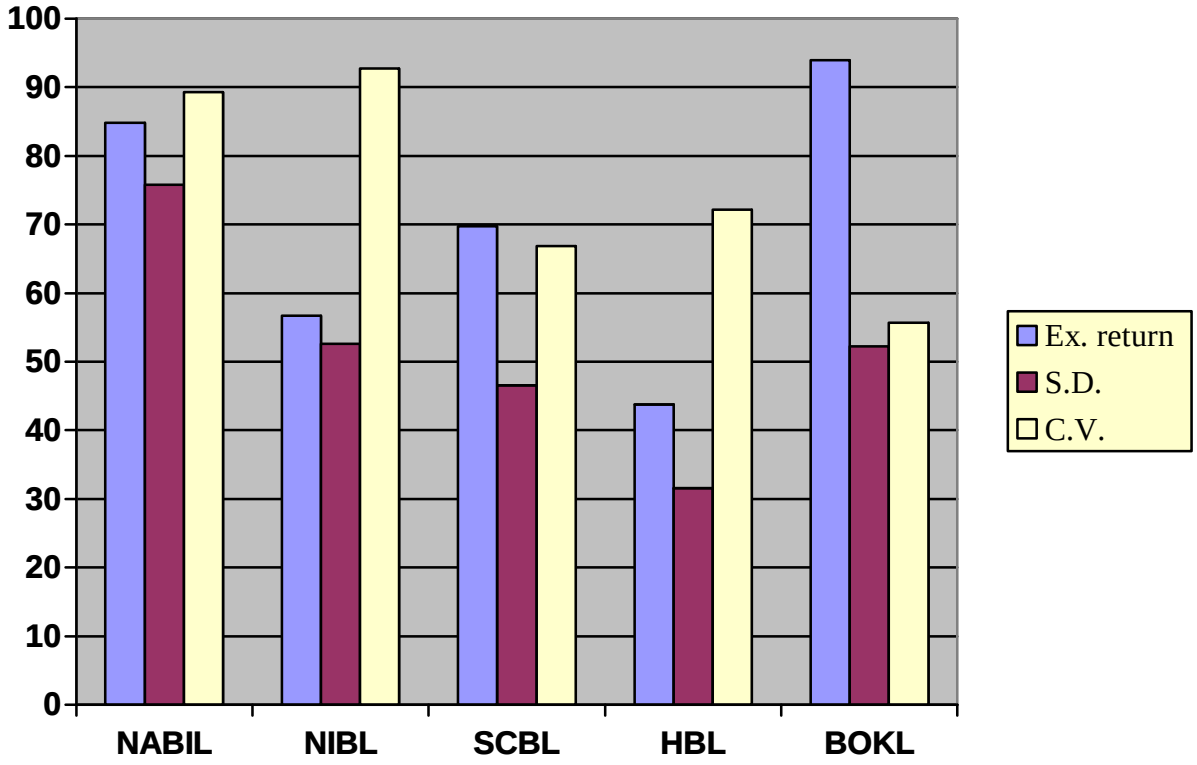


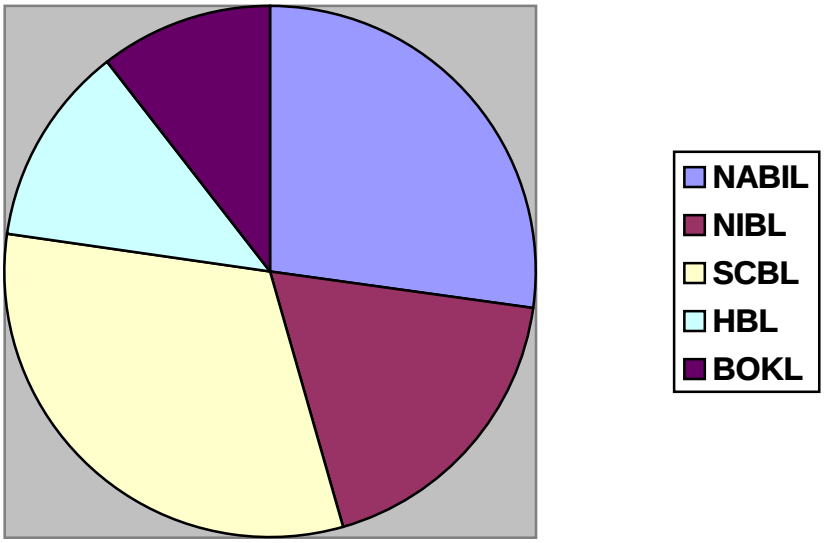

**Table 4.12:- Market Capitalization of Five Commercial Banks at 15th July 2008 (Rs. in million)**

| Banks | Market Capitalization | Percentage(%) |
|---|---|---|
| NABIL | 36259.98 | 27.1834 |
| NIBL | 24564.54 | 18.4155 |
| SCBL | 42337.95 | 31.7399 |
| HBL | 16054.04 | 12.0354 |
| BOKL | 14173.82 | 10.6258 |
| Total | 133390.33 | 100 |

Data source: NEPSE

On the basis of market capitalization, SCBL is the biggest and NBBL is the smallest company.

**Diagram 4.12: Market capitalization of five listed commercial banks at 15th July 2008**



## 4.3 Inter Industry Comparison

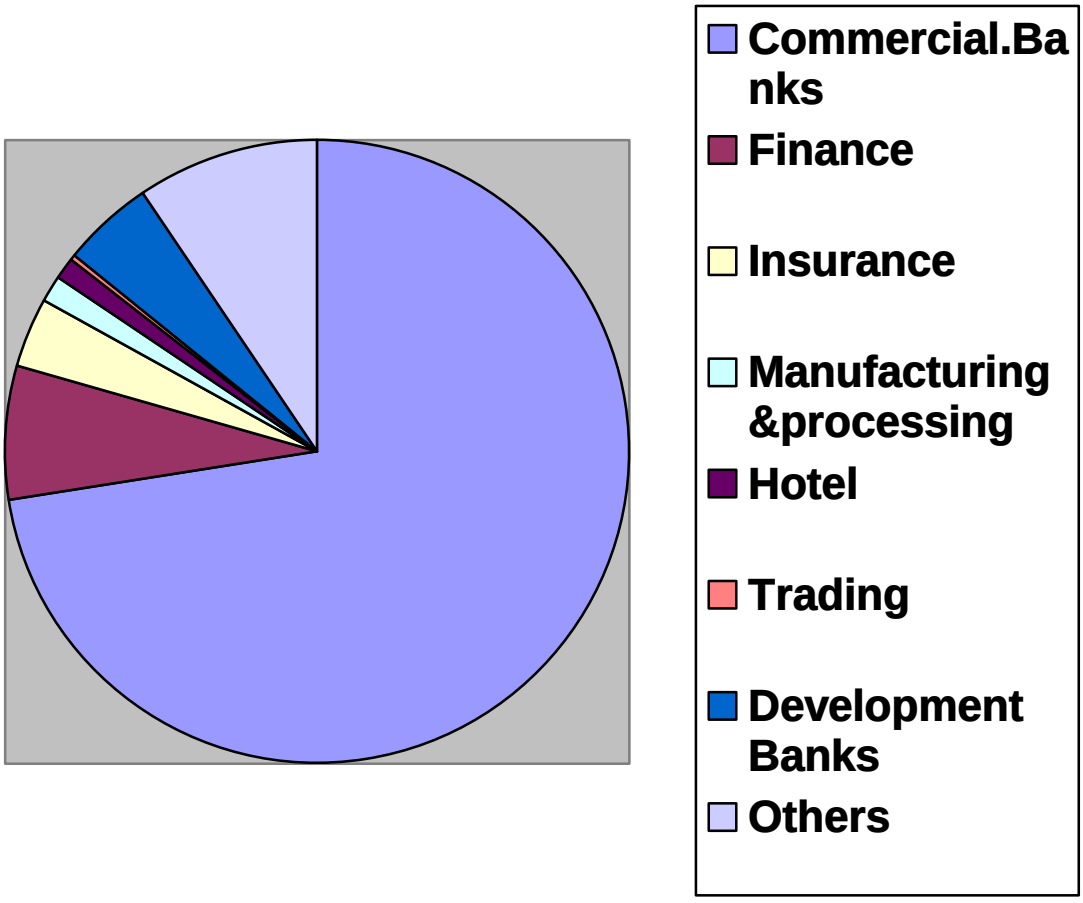
A comparison is made on the basis of Market Capitalization and NEPSE index.

Table 4.13: Sector-wise Market Capitalization at 15th July 2008 (Rs. In Million)

| Name | Market Capitalization | Percentage(%) |
|---|---|---|
| Commercial Banks | 218264.19 | 72.5111 |
| Finance | 20859.85 | 6.93 |
| Insurance | 10537.2 | 3.50064 |
| Manufacturing &processing | 4187.9 | 1.39129 |
| Hotel | 3484.1 | 1.15748 |
| Trading | 600.9 | 0.19963 |
| Development Banks | 15001.6 | 4.98379 |
| Others | 28072.26 | 9.32608 |
| Total | 301008 | 100 |

Data Source: NEPSE (Annual Report)

Diagram 4.13: Sector-wise market capitalization at 15th July 2008




According to the market capitalization, Commercial Banking sector is the biggest and the trading sector is the smallest. It shows that the Banking sector has better performance than that of other sectors.

**Table 4.14: Sector –wise market capitalization of different sectors at the end of fiscal year.**

| Sectors | 03/04 | 04/05 | 05/06 | 06/07 | 07/08 |
|---|---|---|---|---|---|
| Commercial Banks | 27147.42 | 40119.88 | 68694.36 | 135588.4 | 218264.19 |
| Finance | 2911.75 | 3666.13 | 5000.04 | 9889.3 | 20859.85 |
| Insurance | 2549.30 | 3966.10 | 4952.19 | 8059.8 | 10537.2 |
| Manufacturing &processing | 2391.39 | 5024.83 | 5472.11 | 6200 | 4187.9 |
| Hotel | 4644.59 | 2308.38 | 2344.21 | 3261.1 | 3484.1 |
| Trading | 493.09 | 635.88 | 764.44 | 796.4 | 600.9 |
| Development Banks | 490.37 | 1050.07 | 1577.45 | 6010.6 | 15001.6 |
| Others | 796.85 | 4594.62 | 8008.94 | 16495.7 | 28072.26 |
| Total | 41424.77 | 61365.89 | 96813.74 | 186301.3 | 301008 |

Source: SEBO/N (Annual Report)

In the above table, the market capitalization of commercial banking sector is dominating the other sectors. The market capitalization of others sector is least contribution to total market capitalization. The market capitalization in year 07/08 is highest for all years.

## Table 4.15: Sector-wise NEPSE index (at closing date of fiscal year)

| Fiscal year | Comm. Banks | Finance | Insurance | Hotel | Manufacturing and processing | Trading | Others | Development banks | NEPSE market |
|---|---|---|---|---|---|---|---|---|---|
| 03/04 | 231.97 | 195.99 | 237.62 | 184.41 | 255.58 | 95.01 | 142.65 | 190.03 | 222.04 |
| 04/05 | 304.64 | 228.39 | 320.24 | 178 | 276.50 | 123.20 | 347.65 | 237.86 | 286.67 |
| 05/06 | 437.49 | 261.37 | 385.25 | 180.77 | 301.11 | 148.11 | 410 | 294.40 | 386.83 |
| 06/07 | 789.21 | 471.82 | 612.46 | 251.47 | 348.63 | 155.37 | 818.12 | 539.66 | 683.95 |
| 07/08 | 986.7 | 1152.7 | 817.3 | 370.9 | 423.7 | 204.1 | 768.31 | 1285.9 | 963.36 |

Data source: NEPSE (Annual Report)

In the above table, the NEPSE index of all sectors in increasing order but in year 04/05 the index of hotel is decreased.

**Table 4.16: Calculation of Expected Return, S.D. and C.V. of Commercial banks according to NEPSE Index.**

| Fiscal year | Commercial bank | $R=(R_1-R_0)/R_0$ | $R - \bar{R}$ | $(R - \bar{R})^2$ |
|---|---|---|---|---|
| 2002/03 | 199.90 | - | - | - |
| 2003/04 | 231.97 | 16.0024 | -23.268 | 541.381 |
| 2004/05 | 304.64 | 31.3273 | -7.9427 | 63.0861 |
| 2005/06 | 437.49 | 43.6088 | 4.33885 | 18.8256 |
| 2006/07 | 789.21 | 80.395 | 41.125 | 1691.26 |
| 2007/08 | 986.7 | 25.0238 | -14.246 | 202.955 |
| Total | | 196.35 | | 2517.51 |

We have,

Expected return (R)= $\sum$(R)/n

= 196.35/5

=39.27%

Standard deviation ($\pm$ ) = $\sqrt{\sum (R - \bar{R})^2/(n-1)}$

= $\sqrt{2517.51.75/(5-1)}$

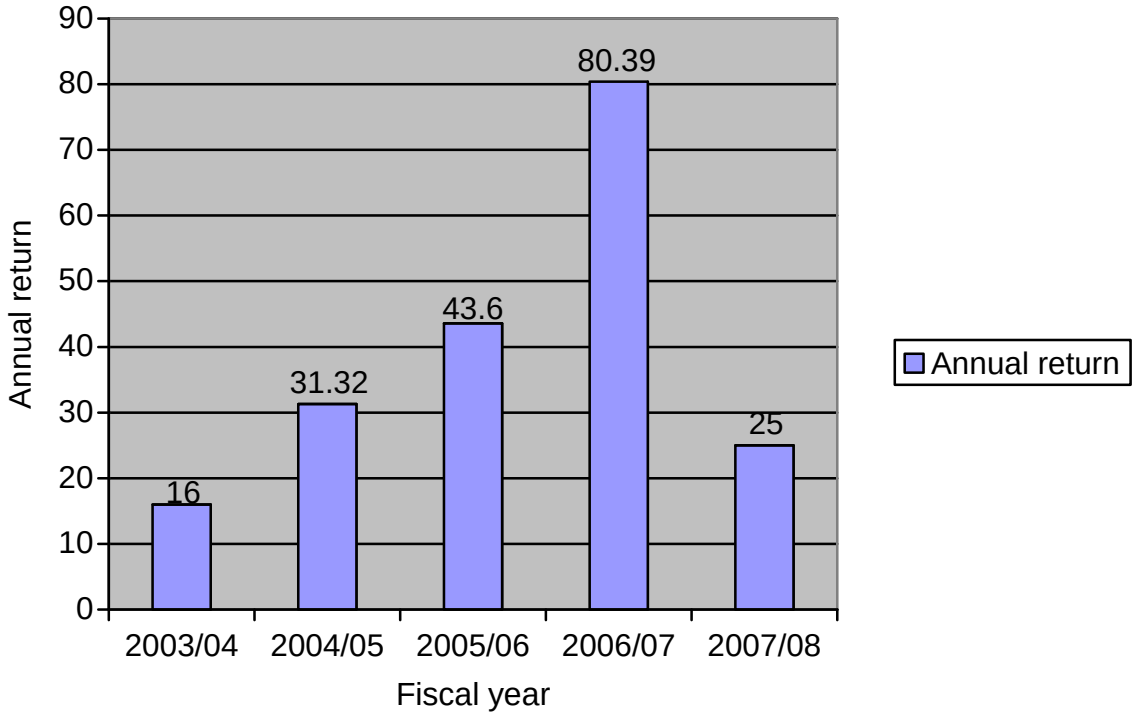
=25.08%

Coefficient of Variation (C.V.)= $\pm \sigma / \bar{R} * 100\%$

=25.08/39.27

= 63.38%

**Diagram 4.14: Annual return of common stock of commercial banking sector**



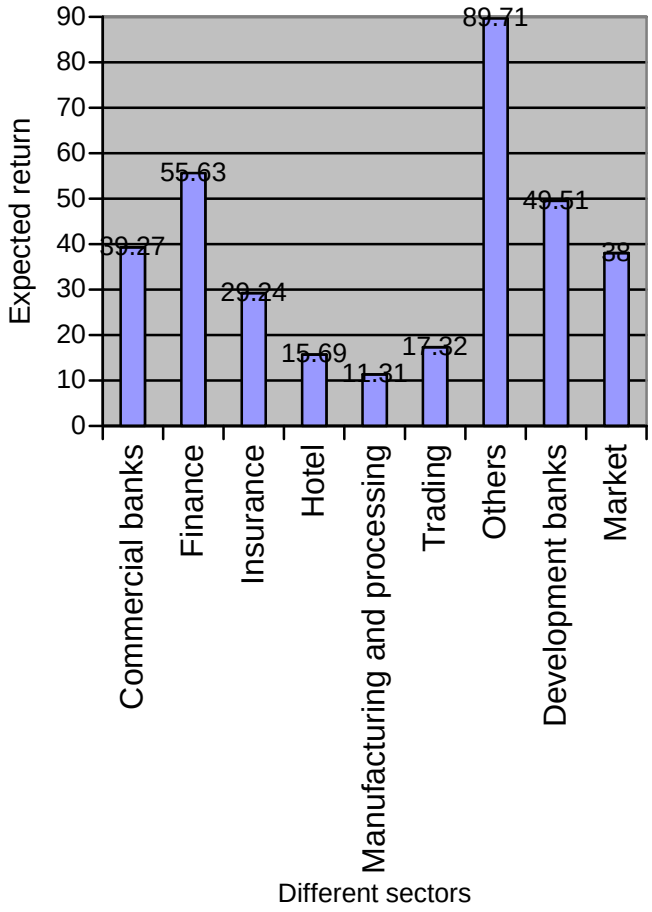

In the above table, the Expected Return of Commercial Banking sector is 39.27%, Standard deviation is 25.08% and C.V. is 63.38%. This is the best for return point of view.

**The Other Sectors Expected Return, Standard Deviation and C.V. are given below;**

4.17 : Expected Return, S.D. and C.V. of different sectors according to NEPSE index.

| Companies | Expected return (%) | Standard deviation(%) | Coefficient of variation(%) | Remark |
|---|---|---|---|---|
| Commercial Banks | 39.27 | 25.08 | 63.38 | Best as per C.V. |
| Finance | 55.63 | 72.95 | 131.14 | |
| Insurance | 29.24 | 22 | 75.24 | |
| Manufacturing &processing | 11.31 | 7.47 | 66.08 | |
| Hotel | 15.69 | 25.53 | 162.73 | |
| Trading | 17.32 | 14.10 | 81.45 | |
| Development Banks | 49.51 | 62.31 | 125.86 | |
| Others | 89.71 | 83.91 | 93.48 | |
| Market | 38 | 24.90 | 65.52 | |

**Diagram 4.15: Expected return of common stock of different sectors**




In the above table, the expected return of Financial sector is the more than other sectors except than others sectors because the others sectors include the hydro powder sector. The expected return of manufacturing and processing is less than all.

The S.D. of the manufacturing and processing sector is least and others sectors is high. Again the C.V. of the commercial banks is least and a Development bank is high.

So, the commercial sector is the best sectors for investment for C.V. point of view.

## 4.4 Comparison with Market

### 4.4.1 Analysis of Market Risk and Return

In Nepal, there is only one Stock Market, namely Nepal Stock Exchange Limited (NEPSE). The overall market movement is presented by market index (i.e. NEPSE index).

The NEPSE index is continuously changing on the basis of market movement. The overall market return, its standard deviation and coefficient of variation is presented below.

**Table 4.18: Calculation of Realized Rate of Return, Standard Deviation, Expected return and C.V. of overall market.**

| Fiscal year | NEPSE index (NI) | $R_m=(NI_1-NI_0)/NI_0$ | $R_m- \bar{R}_m$ | $(R_m- \bar{R}_m)^2$ |
|---|---|---|---|---|
| 02/03 | 204.86 | - | - | - |
| 03/04 | 222.04 | 8.38621% | -29.62 | 877.344 |
| 04/05 | 286.67 | 29.1074% | -8.9 | 79.21 |
| 05/06 | 386.83 | 34.9391% | -3.07 | 9.4249 |
| 06/07 | 683.95 | 76.8089% | 38.8 | 1505.44 |
| 07/08 | 963.36 | 40.8524% | 2.85 | 8.1225 |
| Total | | 190.09% | | 2479.54 |

We have,

Expected return of market ($\bar{R}$)= $\sum(R)/n$

= 190.09/5

=38%

Standard deviation of the market ($\pm$) = $\sqrt{\sum(R-\bar{R})^2/(n-1)}$

= $\sqrt{2479.54/(5-1)}$

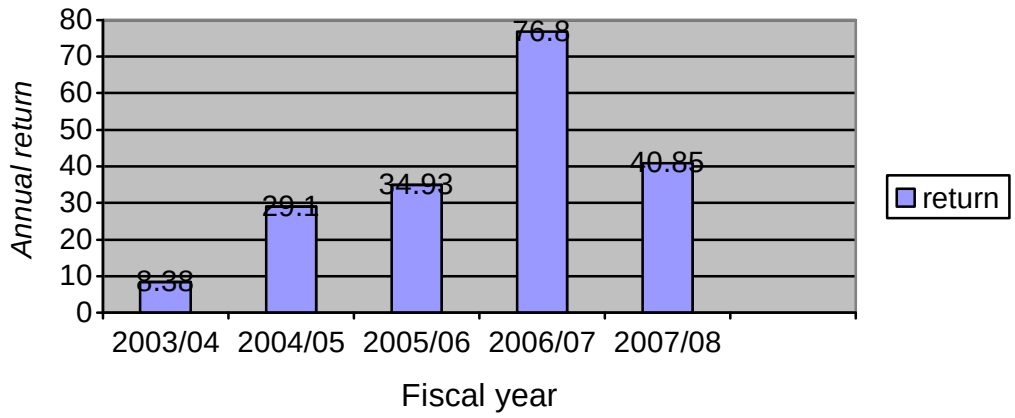
=24.90%

Coefficient of Variation of market (C.V.)= $\pm / \bar{R}$ *100%

=24.90/38

= 65.52%

**Diagram 4.16: Annual return of common stock of market index**




The market return at 2006/07 is high but in the first year it is low. The return is increasing continuously except final.

The Market Expected Rate of Return is 38%, Standard Deviation of market is24.90% and C.V. of market is 65.52%.

### 4.4.2 Market Sensitivity Analysis

Market sensitivity of stock is explained by its beta coefficient, an index of systematic risk. Beta's can be used for an ordinary ranking of the systematic risk of assets. Systematic risk is the thing that matters to investors holding a well diversified portfolio. The greater the beta, the greater the risk and the expected return.

The term $B_j$ is called the beta coefficient which measures the slope of the characteristics line. Mathematically, the systematic risk beta is measured as the

covariance of the stock return with the market returns expressed per units of market variance as follows;

$$B_j = \frac{\text{cov}(R_j, R_m)}{\pm_m^2}$$

$$= \pm_j \pm_m r_{jm} / \pm_m^2$$

$$= \pm_j r_{jm} / \pm_m$$

And $\text{cov}(R_j, R_m) = \sum[(R_j - \overline{R}_j)(R_m - \overline{R}_m)]/(n-1)$

Where,

$\text{cov}(R_j, R_m)$= the covariance of return of the $j^{th}$ assets with the market.

$\pm_m^2$ = the variance of the return of the market index.

$r_{jm}$ = correlation between market return and stock 'j' return.

Table 4.19 Calculation of Beta coefficient ( ) of the Common Stock of NABIL

| Fiscal year | $R_j$ | $R_j - \overline{R}_j$ | $R_m$ | $R_m - \overline{R}_m$ | $[(R_j - \overline{R}_j)(R_m - \overline{R}_m)]$ |
|---|---|---|---|---|---|
| 03/04 | 44.90 | -39.96 | 8.38 | -29.62 | 1183.62 |
| 04/05 | 57.5 | -27.36 | 29.11 | -8.89 | 243.23 |
| 05/06 | 54.48 | -30.38 | 34.94 | -3.06 | 92.96 |
| 06/07 | 220.13 | 135.27 | 76.81 | 38.81 | 5249.83 |
| 07/08 | 47.32 | -37.54 | 40.85 | 2.85 | -106.99 |
| Total | $\sum R_j$ = 424.33 | | $\sum R_m$ = 190.09 | | $\sum(R_j - \overline{R_j})(R_m - \overline{R_m})$ =6662.65 |

We have,

Covariance of stock'j' and 'm',

$\text{cov}(R_j,R_m) = \sum[(R_j - \overline{R}_j)(R_m - \overline{R}_m)]/(n-1)$

=66621/4

=1665

$B_j = \text{cov}(R_j,R_m)/ \pm_m^2$

=1665/620.01

=2.68

Where,

$\pm_m^2$ =variance of market return i.e. 24.90% and

n= number of observation i.e. 5

Since the beta of NABIL is 2.68, which is greater than one (i.e. market beta), its stock is highly sensitive with market as the beta is positive and it is aggressive asset. It shows that if the market return rises by one percent, NABIL's stock return will rise by 2.68 percent.

**Table 4.20: Beta coefficient of each banks**

| Commercial banks | Beta( ) | Remark |
|---|---|---|
| NABIL | 2.68 | Aggressive |
| NIBL | 0.89 | Defensive |
| SCBL | 1.83 | Aggressive |
| HBL | 1.20 | Aggressive |
| BOKL | 0.12 | Defensive |

Since the beta of NABIL, SCBL, HBL are more than one, they are aggressive assets and beta of NIBL and BOKL are less than one so they are defensive stocks for investment.

**Table 4.21:- the beta coefficient, expressed return, required rate of return and price evaluation of all five commercial banks.**

| Commercial Banks | Risk free rate($R_f$) | Beta( ) | $\overline{R}_m$ | Ex.return ($\overline{R}_j$) | RRR=$R_f$+ ($R_m$- $R_f$) $_j$ | Price evaluation |
|---|---|---|---|---|---|---|
| NABIL | 10 | 2.68 | 38 | 84.86 | 85.04 | Over priced |
| NIBL | 10 | 0.89 | 38 | 56.74 | 34.92 | Under priced |
| SCBL | 10 | 1.83 | 38 | 69.71 | 61.24 | Under priced |
| HBL | 10 | 1.20 | 38 | 43.78 | 43.6 | Under priced |
| BOKL | 10 | 0.12 | 38 | 93.92 | 13.36 | Under priced |

Note:- $R_f$=10%, according to assuming Treasury bill rate of 364 days on fiscal year2007/08. source NEPSE

Where,

$R_f$= risk free rate of return

$R_m$= expected return on market

If the required rate of return is higher than expected rate of return, the stock is said to be over priced and an investor sold the holding stock or may involved in short selling strategy. If the expected return is higher than required rate of return, the stock is said to be under priced security and an investor make buying strategy for this type of stock.

In the above table, all the stocks are under priced and so for the investment point of view all are safe for investment. One can easily invest their money for buying the common stock of commercial banks.

**4.5 Portfolio Analysis**

A portfolio is a combination of two or more than two securities or assets. The portfolio management is related to the efficient portfolio investment in financial assets. The portfolio analysis is performed to develop of portfolio that has the maximum return at that ever level of risk and investor think appropriate. If portfolio is being constructed, they can reduce unsystematic risk without losing

considerable return. Therefore we need to extend our analysis of risk and return to portfolio context.

The expected return on a portfolio is simply the weighted average of the expected returns on the individual assets is the portfolio with the weight being the fraction of the total portfolio invested in each asset. The weights are equal to the proportion of total funds invested in each security. The sum of weights must be 100 percent. The analysis is based on two asset portfolio and the tools for analysis are presented in the chapter third, research methodology. Here the

Portfolio of the C.S. of NABIL bank (say stock A) and C.S. of NIBL(say stock B) is done.

**Table 4.22: Calculation of Cov($R_A$,$R_B$) of stock of NABIL and NIBL.**

| Fiscal Year | $R_A$ | $R_A - \overline{R}_A$ | $R_B$ | $R_B - \overline{R}_B$ | $(R_A - \overline{R}_A)(R_B - \overline{R}_B)$ |
|---|---|---|---|---|---|
| 03/04 | 44.89 | -39.96 | 20.12 | -36.6142 | 1463.1 |
| 04/05 | 57.5 | -27.36 | -13.56 | -70.3038 | 1923.51 |
| 05/06 | 54.48 | -30.38 | 115.87 | 59.135 | -1796.5 |
| 06/07 | 220.13 | 135.27 | 71.92 | 15.18063 | 2053.48 |
| 07/08 | 47.32 | -37.54 | 89.35 | 32.61801 | -1224.5 |
| Total | | | | | =2419.1 |

Data is taken from table no. 4.2 and 4.4 respectively.

We have,

$\text{cov}(R_j,R_m)= \sum[(R_j - (\overline{R}_j))(R_m - (\overline{R}_m))]/(n-1)$

=2419.1/4

=604.77

The Optimal portfolio weight of stock A and B which minimized the risk is given below;

$$W_A = \frac{(\pm_B^2 - Cov(R_A, R_B))}{(\pm_A^2 + \pm_B^2 - 2Cov(R_A, R_B))}$$

And $W_B=(1- W_A)$

Where,

$W_A$ =Optimal weight to invest in stock of NABIL

$W_B$ =Optimal weight to invest in stock of NIBL

$\pm_A^2$ = Variance of NABIL

$\pm_B^2$ = Variance of NIBL

Here,

$W_A$= (2768.86-604.77)/(5742.6+2768.86-2*604.77)

=2164.09/7301.92

=0.296

$W_B$= 1-$W_A$

=1-.296

=0.704

Here, if the portfolio is constructed with the above weights the risk can be minimized and it will be the ideal proportion for portfolio.

**Calculation for portfolio Returns:**

It is combination of two or more securities or assets and portfolio return is simply a weighted average of the expected returns on individual stock returns.

Here,

$Avg(R_p)=W_A*Avg(R_A)+W_B*Avg(R_B)$

=.296*84.86+.704*56.74

=65%

Where,

Avg($R_p$)=Expected return on portfolio of stock A and Stock B

Avg($R_A$)= Expected return on NABIL

Avg($R_B$) = Expected return on HBL

Calculation of portfolio risk:

Portfolio risk is a function of the proportion invested on common stocks, the risk ness of the components and the correlation of returns on the stocks or securities. It is measured by standard deviation and calculated by using this formula;

$$\pm_p = \sqrt{W_A{}^2 \pm_A{}^2 + W_B{}^2 \pm_B{}^2 + 2W_A W_B Cov(R_A, R_B))}$$

$$= \sqrt{(\cdot 294^2 * 75.78^2 + .704^2 * 52.62^2 + 2 * .296 * .704 * 604.77)}$$

= 46%

Where,

$\pm_p$ = The standard deviation of portfolio return of stock A and Stock B

By using portfolio, we can lower the risk in comparison to return.

Before diversification, the standard deviation of NABIL and NIBL were 75.78% and 52.62% respectively. But their portfolio risk is only 46% which is less than before diversification. It shows that by using portfolio we can minimized risk without changing in return in same proportion. Thus, the portfolio construction is beneficial for investment.

**Constructing the optimal portfolio:**

**Table 4.23: Data needed to find portfolio**

| Security | Expected Return($\bar{R}_i$) | Excess Return($\bar{R}_i - T$) | Beta($\beta_{im}$) | Unsystematic Risk ($\sigma_{ei}^2$) | Excess Return over Beta $(\bar{R}_i - T)/\beta_{im}$ | Rank |
|---|---|---|---|---|---|---|
| NABIL | 84.86 | 84.86-10=74.86 | 2.68 | 12.9 | 27.9 | 5 |
| NIBL | 56.74 | 56.74-10=46.74 | 0.89 | 22.7 | 52.51 | 2 |
| SCBL | 69.71 | 69.71-10=59.71 | 1.83 | 0.92 | 32.62 | 4 |
| HBL | 43.75 | 43.75-10=33.75 | 1.20 | 1 | 33.75 | 3 |
| BOKL | 93.92 | 93.92-10=83.92 | 0.12 | 27.2 | 699 | 1 |

Note:- $\sigma_i^2 = \beta_i^2 \sigma_m^2 + \sigma_{ie}^2$

**Table 4.24: Calculation for determining cut-off rate**

| Security | $(\bar{R}_i - T)/\beta_{im}$ | $\frac{(\bar{R}_i - T)/\beta_{im}}{\sigma_{ei}^2}$ | $\frac{\beta_{im}^2}{\sigma_{ei}^2}$ | $\sum_{i=1}^{i} \frac{(\bar{R}_i - T)/\beta_{im}}{\sigma_{ei}^2}$ | $\sum_{i=1}^{i} \frac{\beta_{im}^2}{\sigma_{ei}^2}$ | C |
|---|---|---|---|---|---|---|
| BOKL | 699 | 25.70 | .0053 | 25.70 | 0.0053 | 1.59 |
| NIBL | 52.51 | 2.31 | .034 | 28.01 | .0393 | 1.7 |
| HBL | 33.75 | 33.75 | 1.44 | 61.76 | 1.479 | 3.5 |
| SCBL | 32.62 | 35.45 | 3.64 | 97.21 | 5.11 | 4.57* |
| NABIL | 27.9 | 2.16 | 0.55 | 99.37 | 5.67 | 4.55 |

Note- Here* indicates cut-off point.

For calculation of $C_i$, we have;

$$C_i = \frac{\sigma_m^2 \sum_{i=1}^{i} \frac{(\bar{R}_i - T)/\beta_{im}}{\sigma_{ei}^2}}{1 + \sigma_m^2 \sum_{i=1}^{i} \frac{\beta_{im}}{\sigma_{ei}^2}}$$

For BOKL,

$C_1$= (0.062001*25.70)/(1+.062001*0.0053)

=1.59

For NIBL

$C_2$=(0.062001*28.01)/(1+.062001*0.0393)

=1.7

For HBL

$C_3$= (0.062001*61.76)/(1+0.062001*1.479)

=3.5

For SCBL

$C_4$ = (0.062001*97.21)/(1+0.062001*5.11)

=4.57

For NABIL

$C_5$= (0.062001*99.37)/(1+0.062001*5.67)

= 4.55

Here, the value of cut off rate, C* is equal to 4.57 which is cut off rate of SCBL. To find the percentage in each security on optimal, we use;

$Z_i = \frac{\beta_{im}}{\pm \sigma_{ei}^2} [(\overline{R}_i - T)/ \beta_{im} - C^*]$

For BOKL

$Z_1$= 0.12/27.2*(699-4.57)

=0.0044*694.43

=3.05

For NIBL

$Z_2$= 0.89/22.7*(52.51-4.57)

=0.039*47.94

=1.87

For HBL

$Z_3$= 1.20/1*(33.75-4.57)

=1.20*29.18

=35.01

For SCBL

$Z_4$= 1.83/0.92*(32.62-4.57)

=1.99*28.05

= 55.81

For NABIL

$Z_5$= 2.68/12.9*(27.9-4.57)

=0.20*23.33

=4.66

And, $\sum Z_i$ = 3.05+1.87+35.01+55.81+4.66

=100.4

And dividing each $Z_i$ by the sum of $Z_i$ we get the fund to be invested in each securities.

i.e.

For BOKL =3.05/100.4=3%

For NIBL = 1.87/100.4= 1.86%

For HBL = 35.01/100.4 = 34.87%

For SCBL= 55.81/100.4 = 55.58% and

For NABIL = 4.66/100.4 = 4.64%

And hence for optimal portfolio, we can use our fund to 3% in BOKL's securities, 1.86% in NIBL's securities, 34.87% in HBL' securities, 55.58% in SCBL's securities and 4.64% in NABIL's securities.

### 4.5 Correlation Between the Banks

Here, the Correlation between each Banks are given below

**Table 4.25: Various Correlation between each bank.**

| | NABIL | NIBL | SCBL | HBL | BOKL |
|---|---|---|---|---|---|
| NABIL | 1 | 0.15 | 0.81 | 0.98 | -0.31 |
| NIBL | 0.15 | 1 | 0.61 | 0.21 | 0.86 |
| SCBL | 0.81 | 0.61 | 1 | 0.87 | 0.26 |
| HBL | 0.98 | 0.21 | 0.87 | 1 | -0.22 |
| BOKL | -0.31 | 0.86 | 0.26 | -0.22 | 1 |

Calculation are shown in appendix

Here, almost many stocks are positively correlated, few are negatively correlated and some are perfectly positively correlated. In this condition some risk can be reduced or eliminated and some are not reduce and eliminated.

### 4.7 Hypothesis Formulation

**Hypothesis I**

Formulation of Hypothesis;

Null Hypothesis (Ho): Average return of common stock of listed companies is equal to the market return.

Alternative hypothesis($H_1$): Average return of common stock of listed companies is not equal to the market return.

Computation of test statistics

$t= (\overline{X} - « )* \sqrt{n} /S$

$=(69.8-38)* \sqrt{5} /37.48$

$=1.89$

Tabulated value of t at 5% level of significance for 4(5-1) degree of freedom is 2.13

Decision: Since the calculated value of t is less than its tabulated value,

Null hypothesis is accepted. i.e. the average return of common stocks of listed companies is equal to the market return.

**Hypothesis II**

Hypothesis formulation;

Null Hypothesis(Ho): $«_1 = «_2 = «_3 = «_4 = «_5$ i.e. There is no significance difference in average return of commons stocks of listed commercial bank and overall market portfolio return.

Alternative Hypothesis($H_1$) := $«_1 \neq «_2 \neq «_3 \neq «_4 \neq «_5$ i.e. There is significance difference in average return of common stocks of listed commercial bank and overall market portfolio return.

Table 4.26: Computation of test statistics:

| | Holding period return | | | | | Sum of the square | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Fiscal year | Nabil ($X_1$) | HBL ($X_2$) | BKL ($X_3$) | NIBL ($X_4$) | SCBNL ($X_5$) | $X_1^2$ | $X_2^2$ | $X_3^2$ | $X_4^2$ | $X_5^2$ |
| 060/061 | 44.90 | 20.21 | 54.04 | 20.12 | 13.11 | 2016.01 | 408.4441 | 2920.32 | 404.8144 | 171.87 |
| 061/062 | 57.5 | 32.81 | 50.85 | -13.56 | 41.261 | 3306.25 | 1076.496 | 2585.72 | 183.8736 | 1702.47 |
| 062/063 | 54.48 | 28.80 | 161.16 | 115.87 | 82.623 | 2968.07 | 829.44 | 25972.5 | 13425.86 | 6826.56 |
| 036/064 | 220.13 | 99.09 | 64.12 | 71.92 | 136.56 | 48457.22 | 9818.83 | 4111.37 | 5172.486 | 18648.6 |
| 064/065 | 47.32 | 37.99 | 139.42 | 89.35 | 75 | 2239.182 | 1443.24 | 19437.9 | 7983.423 | 5625 |
| Total | 424.33 | 218.9 | 469.59 | 283.7 | 348.55 | 58986.73 | 13576.45 | 55027.8 | 27170.45 | 32974.5 |

Hence,

Total no. of observation (N)=25

Grand total(T)= $\sum X_1 + \sum X_2 + \sum X_3 + \sum X_4 + \sum X_5$

=424.33+218.9+469.59+283.7+348.55

=1745.074

Correction factors (C.F.)=$T^2/N$

=$1745.074^2/25$

=121811

Sum of square between return(SSC)

$=(\sum X_1)^2/n_1+(\sum X_2)^2/n_2+(\sum X_3)^2/n_3+(\sum X_4)^2/n_4+(\sum X_5)^2/n_5$-C.F.

=(58986.73+13576.45+55027.8+27170.45+32974.5)/5

=187735/5-121811

=37547-121811

= -84264

Total sum of square (SST)= $\sum X_1)^2+(\sum X_2)^2+(\sum X_3)^2+(\sum X_4)^2+(\sum X_5)^2$-C.F.

$=424.33^2+218.9^2+469.59^2+283.7^2+348.55^2$-121811

=650460.72-121811

=528650

Sum of a square within return(SSE)=SST-SSC

=528650-(-84264)

=612914

**Table 4.27: ANOVA table.**

| Source of Variance | Sum of source | Degree of freedom | Mean sum of square | F-ratio |
|---|---|---|---|---|
| Between return | SSC=-84264 | C-1=5-1=4 | MSC= -16852.8 | F= -0.55 |
| Within return | SSE=612914 | N-C=25-5=20 | MSE=30645.7 | |
| Total | 528650 | N-1=25-1=24 | | |

Tabulated value of F for V1=4 and V5=20 at 5% level of significance is equal to 2.87

Decision: Since the calculated value of F for (4,20) degree of freedom at 5% level of significance is less than tabulated value, Null hypothesis is accepted. i.e. there is no significance in average of common stocks of listed commercial banks and market portfolio return.

## 4.8 Major finding of the studies

The finding of this study may be important for those who are directly or indirectly concerned with the common stock investment. Thus the following findings can be outlined;

1. Without proper analysis of individual securities of industries and overall market, it is almost impossible to be at the stock market. General knowledge about political economical and technological trend is advantageous.
2. The higher risk of common stock may have greater possible return.
3. On the basis of market capitalization, the commercial banking sector is doming all other sectors that mean the banking sector has good performance than others.
4. Others sector has the highest expected return 89.77%, this is due to the inclusive of the new project i.e. hydropower, the finance sector is in the second position i.e.55.63% and the commercial banks expected return is 39.27%. As so, the expected return of manufacturing and processing industry has least among all the sectors.
5. The four commercial bank stocks are under priced and one bank stock is over priced among the five listed commercial banks i.e. investors need to buy these stocks. The NABIL bank stock is over priced. So, the stockholder want to sell these securities.
6. By using Sharpe single index model for optimal portfolio, we can use our fund to 3% in BOKL's securities, 1.86% in NIBL's securities, 34.87% in HBL' securities, 55.58% in SCBL's securities and 4.64% in NABIL's securities.

7. The first hypothesis is based on the taste of average return of common stocks of listed companies are equal to the market return or not and it was found that if the level of significance is 5%, Null hypothesis is accepted. i.e. Average returns of listed commercial banks are equal to market return,
8. The second hypothesis is based on the test the significance difference in average return of common stock of listed commercial banks and overall market

portfolio and it was found that the Null hypothesis is accepted at 5% of level of significance i.e. there is no significance difference in average return of common stock of listed commercial banks and overall market portfolio.

# CHAPTER-5

## Summary, Conclusion and Recommendations

This chapter summarized the whole study, draws the conclusion and forwards the recommendation to erase the weakness and drawback of common stock investment observed on the basic of findings.

### 5.1 Summary

This first chapter focuses the brief background of the study, statement of the problem, objective of the study, significance of the study and limitation of the study. Finally, it also presents the organization of the study.

The Literature review of this study is given in the second chapter. It includes the conceptual framework and the review of previous studies in the same area. The conceptual framework consists of concept of risk and return.

Research methodology deals with the introduction, research design, nature and source of data, population and sample, and method of data analysis. Financial tools like MPS, DPS, EPS, Return on common stock, Expected return on common stocks, standard deviation, coefficient of variation, portfolio risk, portfolio return, and required rate of return have been used to measure risk and return of commercial banks. T-test and ANOVA has also been used as statistical tools.

Data presentation and analysis of this study includes the data presentation and analysis and major findings of the study. Analysis of risk and return for five years has been done.

People participate in security investment and its dynamic trading plays a vital rate in overall economic development of a nation. Commercial banks mobilize cash in that areas where return can be maximized with low risk. So, the central focus has been given to commercial banks to trade off between risk and return. Capital market is a

barometer of economic development and sustainable growth of the capital market depend upon the hosts of factors.

Risk and return plays vital role in the analyzing of investment. Risk and return is getting considerable attention in financial filed. Stocks may have greater volatility risk than other investment that takes a random and unpredictable path. Higher risk may have greater possible return. Investor's attitude, perception and risk handing capacity also play essential role in rational investment decision. Diversification lowers the risk of the portfolio.

Since the main objective of the study in to analyze the risk and return of common stock investment of commercial banks in Nepalese context, the study is focused on the common stocks of listed five commercial banks which are taken as

reference. While analyzing the risk and return, brief review of related studies has been performed. Scientific methods are used in data analysis and tables, graphs and diagrams are used to perform the both qualitative and quantitative results. Secondary data are collected from NEPSE and other related companies and SEBO/Nepal through staff of the Companies and officials of SEBO/N and NEPSE and also through the visiting of the commercial banks.

**5.2 Conclusions**

The conclusions of this study may be important information for those who are directly or indirectly concerned with the common stock investment. Thus the following conclusion can be outline;

i. Stocks have greater volatility risk than other investment, which takes a random and unpredictable path. Stock market is risky in the short term and it is necessary to prepare the investors for it.

ii. This study used the historical data of five years starting from F/Y 2003/04 to 2007/08 and found that F/Y 07/08 is the best for ranking sector according to market capitalization.

iii. Expected return of the C.S. of BOKL in maximum (i.e.93.92%) and HBL is minimum (i.e. 43.78%). On the basis of sector-wise companies, expected return of others sector is highest (i.e. 89.97%) due to inclusive of hydropower project.

iv. Risks associated with common stock investment of different selected companies are 75.78, 52.62, 46.57, 31.60 and 52.26 for NABI,.NIBL,SCBL,HBL, and BOKL respectively. In the context of comparison of banking sector with other sectors, expected return of others sectors is greater than that of other sectors. The C.V. of commercial banking sectors is lowest than that of other sector. So, the commercial sector is considered as the best sector. And the S.D of the manufacturing and processing industry is lowest among all.

v. The beta explains the sensitivity of volatility of the stock with market. If beta is greater than one, then the asset is called an aggressive asset. If beta is less than one, asset is called defensive stock, and if the beta is equal to one, the asset is called average asset. In this study, NABIL, HBL and SCBL's beta coefficients are 2.68, 1.20, and 1.83 respectively which is greater than one; therefore such banks common stocks are more volatile with market. On the other hand NIBL and BOKL's beta coefficients are 0.89 and 0.12 respectively which are less than one, therefore C.S of NIBL and SCBL are said to be less volatile with market.

vi. The stock of all banks in this study are said to be under priced except NABIL which stock are over priced. These companies' common stocks are worth to purchase, as their expected return is greater than required rate of return. The NABIL stock is worth to sell, as their expected return is less than required rate of return.

vii. By using Sharpe Single Index Model for optimal portfolio, we can use our fund to 3% in BOKL's securities 1.86% in NIBL's securities 34.87% in HBL' securities, 55.58% in SCBL's securities and 4.64% in NABIL's securities.

## 5.3 Recommendations

The recommendations of this study may be the important for those who are concerned directly or indirectly with the common stock investment. Thus the following recommendations can be outline;

i. Expected return recommend that commercial banking sectors common stocks are the best for investment because the C.V. of commercial bank is

least. And similarly while analyzing individual security, BOKL seems the best for investment by the view point of expected return.

ii. The four listed commercial bank stocks are under priced so the investor should invest their funds on those stocks that are more beneficial. And one listed commercial bank stock is over priced so the investor should require selling that stock.

iii. The C.V. recommends that the commercial banking sector is the best one for investment due to the less C.V. than that of other sectors. Similarly while analyzing individual security, BOKL is the best for investment of the view point of C.V. and beta coefficient, which has lesser C.V. and Beta (i.e. 55.64 and 0.12 respectively).

iv. One of the most important things to consider when choosing investment strength is the balance between risk and return that you are comfortable with.

v. Stock market investment is a risky job. This is one game where self-knowledge, superior feasting ability, sound understanding on the information of stock market can give a winning stage to the investors.

vi. Investors should diversity their funds to reduce risk with the help of optimal portfolio concept. It is said that “Be aware of one product companies”. It means things can change; do not put all your eggs in one basket.

vii. It is better to buy something that is going up and sell something that is going down. Adding more, when something is good makes it better. More of something bad, usually makes things worse.

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