

CHAPTER ONE **INTRODUCTION**

1.1:-BACKGROUND INFORMATION:-

Economic development plays an important role to develop the nation. All individuals and organization earn or raise money and invest it. Success of economic development depends on financial activities. Finance is concerned with the process of institution, market and instruments involved in the transfer of money among and between individual business and the government. To manage the managerial decision is necessary. Each and every management decision is based on the financial analysis. Managerial finances are an exciting and dynamic of study and its importance to long run success of today's business is unquestioned. The finance is concerned with the conversion of capital funds to meet financial needs of organizations as well as individuals. Finance has become an important part of any economy in which share market is leading sector. Securities raise funds in capital market that certainly help to expand the national economy. Capital formation is one of the most important and strategic factor for overall economic development in fact capital accumulation may be regarded as the core process by which aspects of development is possible.

All the business enterprises required short term funds as well as long term funds. Long term funds are highly significant for future growth and prosperity. Most of the organization generates these types of funds for financial market and banking sector. Similarly government also borrow amount of funds to fulfill the demand of public. Similarly to meet the change in life style of people money is most important factor among the various factors. All of this has included by business to gear up investments in money fields where investments need huge amount, which cannot be covered by the firm's post profit and surplus of individual sector only. Thus market manages the funds transfer to one until to another unit. "The Financial market permits both business and government to raise the needed funds by selling securities, simultaneous investor with excess of funds are able to invest and earned in

term enhancing their welfare”.(John 1992:261). The purpose of Financial market in an economy is to allocate saving efficiently during the period of time a day a week or a quarter to parties who used funds for investment in real aspects of consumption (Van Horne 1998:491). In financial market financial intermediaries play an important role to inflow saving from server to user of funds indirectly.

Securities market exists in order to bring together buyer and seller of securities meaning their mechanism and are created to facilitate the exchange of financial assets. The stock market, which probably has the greatest glamour, is perhaps the least understood. Some observers consider stock market investing as game in which sole purpose is picking winepress. Lord Keynes was the first person to express stock market as “a game of professional's investments”. The main objective is to win or loss of money. Stock market provides both opportunity as well as threats the people having better knowledge realize opportunity and those who is unknown get threats.

Nepal is a land locked country having limited resource. The economic development of Nepal has been limited by the variety of geographical and structural constraints such as limited exportable resources, low economic growth, low saving and income, limited transport facilities and infrastructures are the major obstacles for the economic growth.

So in context of Nepal banking plays significant role to the development of National economy. Bank is a financial institution which primary deals in borrowing and lending. Modern bank perform varieties of function so it is difficult to define the function of bank. The bank is derived from the Italian word “BNACA” which means counter table or bench used by medieval money exchange. Oxford dictionary defined bank as “an establishment for the custody of money”. (oxford 1986)

Different economist defined the bank in different way “A bank is an institution whose debts are widely accepted in settlement of their people’s debt to each other”. (Sayer 1967:3)

Though Nepal is least developed country from the ancient time financial transaction were operated. Financial transaction through personal lenders are still present in economy. In eighteenth century, king Gunkama Dev took the form of merchant to rebuild the kathmandu city and later on Shankhadhar Shah, a trader cleared the loan in B.S 937 and established 'Nepal Sambt' as found in the history. King Jayasthiti Malla of fourteen century divided the people into different group performed the task of discounting and providing the loan. In nineteenth century, the then Prime Minister Rannodip Singh provided the loan at a cheap rate only to the government employee by establishing "Tejarath Adda".

In Nepal context some financial institution involved in capital market are Nepal Rastriya Bank, Commercial Bank, Development bank i.e Agriculture Development Bank, Nepal Industrial Development Corporation, Employers provident funds, citizen investment trust, securities board, NEPSE, Rastriya Bima Sansthan, Insurance companies, Financial institution co-operative, Non-government organization, some hotel, manufacturing and trading agencies.

Although there are various types of bank, only commercial bank are considered. Nepal Bank Limited is the first commercial bank established in 1994 B.S. later on Nepal Rastriya Bank was established in 2013 B.S as a central bank and Rastriya Bank was established in 2027 B.S under full ownership of government. After then many other joint venture Banks were established. Nepal Arab Bank Limited of NABIL was the first joint venture bank established in 2041 B.S. in 2043 B.S second venture bank was established, named as Indousez Bank Ltd. now it is recognized as Investment Bank. In the same year Nepal Grindlay's Bank (now Standard Chartered) in the form of joint venture was also established. More joint venture bank came into existence after the restoration of democracy. After the restoration of democracy, economic policies were liberalized and provision was made to establishment of joint venture. After then Himalayan Bank Ltd. (2049), Nepal SBI Bank Ltd. (2050), Nepal Bangladesh Bank Ltd. (2051), Everest Bank Ltd. (2051), Bank of Asia(Nepal) and other major non-joint venture bank as NIC Bank, Kumari

Bank, Goble Bank, sunrise Bank, Machhapuchre Bank Ltd. and other bank which all help in commercial activities and increase in growth of economic level of people.

These institutions play vital role in the development in the development of capital market like money market. Nepalese capital market is also classified in organization and non-organized sector. Government agencies and other institution which are already mentioned above categorized in organized sector. They provide long term funds for development of agriculture and commercial sector by investing in common stock; debenture government bond investors, Merchant and private sector also help for development of capital market.

Securities board Nepal (SEBO) was established on 26may 1993 under the provision of securities exchange act 1993. It is established with the objective of protecting, promoting and development of securities marked in Nepal. In Nepal buying and selling activities of financial securities is conducted in Nepal stock exchange (NEPSE). NEPSE is the only stock exchange in the country. It is owned by Nepal Rastriya Bank (the capital bank) and Nepal Industrial Development Co-operation (NIDC).

Many people visit the NEPSE with an objective to test their fate. While doing so many people visit the NEPSE with broker and loss their money. Thus investment required to know why a stock should be purchased. What will be the expected return of his/her investments? What is the risk and how to minimize it?

Thus the present study is carried out to analysis the risk and return of stock. Why they are important and how to minimize the risk. The risky side of investment cannot be denied. But most of the investors are risk averter. They do not like the risk and they do every activity to avoid or minimize the risk.

“Risk plays central role in analysis of investor often ask about the total risk they will be assuming in an investment and like to know if the risk premium provided as enough. But they are also consumed about many other issues. First of all it is necessary to see if the total risk associated with it is relevant for them. Second they need to know actual contribution of an asset risk

to portfolio risk” (*Pradhan 2001:334*). The meaning of investment in an issue is a sacrificing current amount for future development. Investment is a canalization of collected saving from savers by way of credit and loans to money reserve. Hence people are very conscious about sacrificing the current amount as there are possibilities that sacrificed amount may not be recovered fully or partially in future. Thus, the people who invest their wealth must think clearly about their investment with consideration of risk.

“Risk is considered as the variability of return from those are expected and return is considered as an income received on an investment plus amount of change in market price that is generally expressed as the percentage of beginning market price of an investment” (*Van Horne and John 1997:90*). Risk cannot be avoided if investor is seeking higher rate of return. Investor will require different rate of return on various securities since they have different risk. Higher the risk of security, higher the rate of return demanded by investor.

“Risk present in virtually every decision. Assessing the risk and innovating the same in the final decision is an internal part of the financial analysis. The objective in decision making is not to eliminate or avoid risk often it may be neither feasible or non necessary to do so but properly assess it and determine whether it is worth bring” (*Prasanna 1999:67*)

Thus it creates curiosity to researcher and other individuals towards the risk and return. Hence, study of the risk and return on analysis of Commercial Bank has great importance and are interesting subject. In today’s dynamic and competitive environment, it is increasingly important for the financial institution to evaluate the risk and return position and compare with their competitors to retain their existing customer's band attract their potential customers.

1.2:-FOCUS OF THE STUDY:-

Financial institutions are the requirement of every economy. They are pillar of nation’s economy. They are required as storehouses of country’s wealth as well as reservoirs as of source for economic development.

The main focus of this study is the risk and return analysis of the common stock investment of listed commercial bank of Nepal. Various kinds of financial decision are taken in the institution. Among them deposit, acceptance, enhancing loan and investment of decision are most importance one. When the term investment is pronounced two fundamental aspects risk and return are associated with it. Since an investor always analysis the risk and return thoroughly before investing their wealth. Thus the study is focused on the risk and return analysis of selected commercial banks. Although the risk and return analysis sounds to be familiar, the conceptual meaning of risk and return vary firm investor to investors.

The main purpose of study is to analyze how to get sustainable profit by minimizing the risk. People prefer less risk to more return i.e they try to ignore risk, which is not possible for this purpose. Expected return, total risk, systematic risk, unsystematic risk are analyzed to give an idea to get sustainable profit by diversifying the risk to avoid future loss and the common stock investment. The analysis of risk and return is very significant in investment decision as well as financial decision. It influences the risk and return of the shareholder. Consequently the risk and return analysis influences the market price of the stock. So before making an investment decision a person must analyze the risk and return from the particular stock as well as they can make good risk minimizing making profit too between their investments in the stock.

Risk and return are two important criteria for investment decision. Return is the income from an investment. Return is generally understood as a reward or receipt as cash inflow for an investment. The term return from a capital investment is a concept that has different meaning to different investor. Some regard it as a short term cash inflow while the other perceive as high growth rate and higher rate of return in the long run still other measures it in terms of financial ratio such as return an investment and return on equity.

Similarly in the case of risk also the investor interprets the term risk differently. Some perceive it as a fluctuation in market price of the investment

while other considers it as an uncertainty of return. In view of most of people risk is defined as chance of loss. In reality risk occurs when we cannot be sure about the outcome i.e investing can produce more than one outcome in future. So risk can be defined as chance of receiving an actual returns other than expected which singly means there is variability in the return or outcomes from the investment. Normally an investor performs a higher return from a lower risk. But we all know the fact higher return has higher risk associate with it. To make a trade of between risks and return the risk relating to an investment project is determined by using statistical tools, profitable ratio, trend analysis, mean standard deviation, co-efficient of variance. Karl's Pearson's of co-relation.

In context of Nepal, the capital market is growing very slowly. The market is not sufficient. There are very few magazines and related documents of capital market are available. Because of these most of the investor investing on capital market without any proper knowledge and information. This study will give information about Nepalese capital market by analyzing risk and will definitely contribute to increase the analytical power of the investor in capital market. This study may be the master of interest for academicians student and teacher and researcher in field of finance because this study is not only fulfill the requirement of Master degree on business but also provides some knowledge about the Nepalese stock market development. It is suggested to the policy makers t make necessary policies to attract private sector investment in the productive sector and reforms in policies related to stock trade. It is believed that this study help many investors to know how they should use their money while investing in financial securities.

Thus it is cleared that study is focused on risk and return analysis of commercial bank viz, Nepal Arab Bank Limited (NABIL), Bank of Kathmandu(BOK), Standard Chartered bank Ltd.(SCBNL), Everest Bank Ltd.(EBL),and Himalayan Bank Ltd.(HBL)

1.3:-STATEMENT OF THE PROBLEM:-

This successful operation of commercial bank leads to the upliftment of the nation's economy whereas worst operation causes series of problem i.e financial condition of the country. Investment in financial securities was not popular indicate ago in our country. Most of people of Nepal do not know about share, debenture and other securities because capital market is not developed in Nepal. On the other hand there are no any strong commitments or policy made by the government towards increasing public investment in policy market. Mainly some private and joint venture commercial bank are main root for many of such investment in financial securities. Stock broker and financial institution have no effective program to develop investors knowledge so that more over people is unfamiliar with stock investment. It is believed that people have money for investment but the investment sector is limited except than a bank to invest in unproductive sector like big buildings and other unproductive item.

The attitude and perception of investor play vital role in investment decision which is influenced by the information and access to the data required for analysis. So lack of information and least knowledge is chief problem faced by investor. Investor invest their wealth on the basis of guess and hunches because they do not have appropriate information about the financial asset and also lack of idea reach to ideal decision. Investor purchase stock merely looking past trends of stock price and sometimes they have to bear heavily loss due to inadequate knowledge and information related to field of stock investment.

In efficient market condition stock price is equal to the intrinsic value of stock when require rate of return and expected rate of return are equal. It is also the stock remain in security market line (SML) if case is not so they strive towards this line. But practical and theoretical concept may not always much others.

Thus in Nepalese context the investment decision is rarely taken after the analyzing the performance of stock. So the risk and return analysis of selected commercial bank in Nepal is faced many problems.

Some research problems are as follows:

1. What are the criteria for evaluation of the stock which will give favorable decisions?
2. What are the sources of risk?
3. How do they know about the magnitude of risk?
4. What is the meaning of return and expected return?
5. How the returns are calculated?
6. What are the rate of return of each commercial bank?
7. How can one make higher return through lower risk?
8. What are the correlation among the return of commercial bank?
9. What are the determinants of the share of selected commercial bank?
10. What are the comparative risk and return position of these sectors?

This study is attempt to answer such question and also attempt to give suggestions for a rational investor.

1.4:-OBJECTIVE OF THE STUDY:-

Each and every study is done to achieve desired mission and goal. The main objective of the study is to analyze, examine and interpret the risk and return on the basis of selective statistical as well as financial tools and technique. Investor are always seeking to select an optional investment opportunity because all investor prefer less risk and high return and they don't want to make a blind speculation.

he specific objective of risk and return analysis are as follows :

1. To evaluate risk, return and other relevant variable that directly effect the investment in common stock.
2. To find out the rate of return of various common stock.
3. To find out the standard deviation and coefficient of variation of commercial bank.

4. To analyze the co-relation among the return of commercial bank.
5. To analyze comparative risk and return position of these sectors.
6. To know the permanent risk (beta coefficient) of stock.
7. To know the required rate of return (SML equation) of a stock.
8. To provide suggestion, some practical ideas and re-commendation based on analysis of data for investment on common stock of commercial banks.

1.5:-IMPORTANCE OF THE STUDY:-

The study will have both academic as well as practical significance. The findings and conclusions of the study will add to literature of risk and return theory in general and to the Nepalese literacy of financial theory in particular.

This study will provide practical importance to commercial bank to making their financial decision. It is one of the most important topic for all the stakeholders who are interested to know the risk and return position of common stock invested of commercial banks. People are curious to know risk and return of common stock investment of commercial bank that help to minimize their risk position. As all the financial institutions are the bases for economic growth of nation, the study has significance to various people in various ways e.g. management, shareholders. The businessman and entrepreneur, the government and the individuals.

The managers are always interested to know the financial condition of the organization. It helps them to find the degree of tolerance of risk under a given return. In the same way the shareholders are the real owners of the institution. They have keen interest to know about the risk of their investment. The commercial banks that perform well is always regarded, appreciated and performed by the businessman and entrepreneur for their financial transaction. They prefer the bank having low risk and high return. Similarly, it helps to the government. Commercial bank play a vital role for the economic growth and development of nation. The government has always interest to know the risk of commercial banks because the study helps to formulate the appropriate plan and policy for the country and also create conducive investment environment.

A part from above mentioned parties the study is also important to other individuals that comprise of customers, creditor, investor, competitors, stockbrokers, student, economist, statistician and other rational individuals who interest in the field of finance.

1.6:-RESEARCH HYPOTHESIS:-

Hypothesis is simply a statement about the population. Hypothesis is an assumption made about the population parameter for which the test is carried out. It is an assumption made on the basis for researching “ a hypothesis in statistics is simply a quantitative statement about a population.” (*Gupta 1995:32*). Hypothesis is a statement which if proved becomes a theory. Each test contains two hypotheses, one begin null hypothesis and other begin alternative hypothesis. Since there is only one test carried out in the study, there are two hypothesis which are presented as under:-

Hypothesis applied for the test

H0: There is no significant of relationship between expected return and beta coefficient of selected commercial banks under study.

H1: There is significant relationship between expected return and beta coefficient of commercial banks under study.

TEST OF STASTICS (F- TEST)

$$F = \frac{\text{Explained Variance}}{\text{Unexplained Variance}}$$

$$F = \frac{\text{Explained Variance d. f}}{\text{Unexplained Variance d. f}}$$

Where d.f = degree of freedom

1.7:- METHADODOLOGY:-

The research methodology is the systematic way of solving research problem “research methodology refers to the various sequential steps to be adopted by a researcher in studying a problem with a certain objective in view” (Kothari 2000:02). Thus the main purpose of this study is to stress on the different research method and condition which are used in this study.

Research is systematic and organized effort to investing specific problem that need a solution. This process of investigation involves a series of well though activities of gathering, recording, analyzing and interpreting the data with purpose of finding of problem is called research.

It consists of research design nature and source of data, population and sampling method statistics tools and method of data analysis.

RESRARCH DESIGN:-

The research is based on recent historical data, so simply it is a historical research. Research design is defined as a framework plan and structure for collecting analyzing and evaluating data. It is a procedure and technique which provide ways for research validity. As the research belongs to risk and return analysis, the research is based on recent historical data which covers the six year period of data 2001/02 to 2008/09. It deals with the common stock of commercial banks on the basis of available information.

NATURE AND SOURCES OF DATA:-

The study is primarily based on the secondary sources of data. The data are obtained from Nepal stock exchange (NEPSE), security board of Nepal, staff of Nepal stock exchange, stockbrokers and related banks annual report (AGN). Data's related to market price of stock, market capitalization, movement of NEPSE index is taken from the trading report published by NEPSE and website of Nepal's stock exchange. Annual report of commercial bank's and financial statement are also taken for respective banks. During the study informal opinion. Survey has also been taken with individual investor and bank officer.

POPULATION AND SAMPLING METHOD:-

The study is based on the companies listed in the Nepal stock exchange. There are 146 companies listed in NEPSE until 2066 Chaitra 31st. Since the study is concern related in listed commercial bank only. There are commercial banks listed in Nepal stock exchange. For the purpose of study only 5 commercial bank are taken as sample.

STATISTICAL TOOLS AND METHOD:-

Before analysis, data are presented symmetrically in the formats of table, charts and graphs. For analysis purpose following factor and statistical and financial are used.

MEAN:-

It is the simplest statistical tool, which may be defined as the average value of distribution.

$$\bar{X} = \frac{\sum X}{N}$$

STANDARD DEVIATION:-

It is an importance statistical tool commonly used to measure the dispersion in the distribution. It is square root of variance. It is expressed as:-

$$S. D. (\sigma) = \sqrt{\frac{1}{N} \sum F(X - \bar{X})^2}$$

Similarly, correlation coefficient, regression analysis, coefficient of variation DPS, MPS are used for data analysis.

1.8 LIMITATIONS OF THE STUDY:-

Every research neutrally has some limitations so that this study is not an exceptional case. The major limitations are as follows:-

1. The study covers the relevant data only for 6 year i.e from fiscal year 2001/002 to 2008/009.

2. Altogether commercial bank i.e Nepal Arab Bank, Standard Chartered Bank Nepal Ltd., Himalayan Bank Ltd., Nepal SBI Bank Ltd., Everest Bank Ltd. have been taken into consideration for the study purpose listed in Nepal stock exchange (NEPSE).
3. The risk is measured by Standard deviation of the return of banks.
4. Major portion of analysis and interpretation have been done on the basis of available secondary data and information. So, the consistency of finding and conclusion strictly depends on the reliability of secondary data information.
5. The study is limited from the point of view submission impartial fulfillment of the requirement of master degree.
6. Variation in data published from different sources e.g figures published by NEPSE and companies different to some degree.
7. The study is fully based on student, financial resources and is to be completed with in the limited time. So these are the major limitations of the study.

1.9:-ORGANIZATION OF THE STUDY:-

The study has been divided into five chapters. The title of the chapters is as follows:-

CHAPTER ONE: - INTRODUCTION

It includes the introduction and general background statement of the problems, objective of the study, focus of the study, significance of the study, limitations of the study and organization of the study.

CHAPTER TWO:- REVIEW OF THE LITERATURE

It includes review of available literature related to area of this study. It is directed towards the review of conceptual framework and review of major related studies.

CHAPTER THREE:- RESEARCH METHODOLOGY

This unit present research methodology used in the study which includes various tools and techniques. It consists research method as library research

and field research source of data population and sample research design methods of data analysis etc.

CHAPTER FOUR:- PRESENTATION AND DATA ANALYSIS

In this part of the study all the data are presented in the tabular and graphical form as per the requirement of the study. After this the interpretation and analysis are done.

CHAPTER FIVE:-SUMMARY, CONCLUSION AND RECOMMENDATION

It includes the summary, conclusion and recommendation of the research and finally suggestion and recommendation are given.

CHAPTER TWO **REVIEW OF THE LITERATURE**

Final institutions are the essential part of the economy for every country. They are the life hood of economy and serve as the barometer of economic prosperity. The financial condition of these institution needs to be proper condition. The risk and return aspect of institution need to be evaluated properly. In this context, the study attempts to review the literature. The review of literature is most important part of all study. Review of literature reviews the book, journals, magazines or any other types of studies which are related to his/her field of study. Research is continuous process that never ends. The producer and researcher may change but the research may continue. The review of literature is a way to discover what other research in the area of our problem has uncovered. It provides the foundation for developing a comprehensive theoretical framework from which hypothesis can be developed for testing. “ The purpose of review of literature is thus to find out what research studies have been conducted in ones chosen field of study and what remains to be deserve” (Wolff a panth 2003:35). Thus the preview study cannot be ignored because it provides the foundation to the present study.

The review of literature for our study is classified into three section. The section begins with a definition. The second section follows with the theoretical review of risk and return literature which are related to the topics risk and return is reviewed. Topics from basic academic courses of books, different studies published in magazines, thesis of seniors and journals related to study are reviewed below.

2.1 DEFINITION AND THEORITICAL FRAMEWORK:-

The definition of the terminology used in the study needs to be described properly. It helps to clear the vision of the study. This makes the study more meaningful and easy to understand the problem of the study. The objective of this section is to know how the various writers have defined the risk and return.

1. COMMON STOCK:-

Common stock represents an ownership position in a corporation. By purchasing a position of share of corporation a person can become a shareholder with share degree of control over the company. Hence, common stock holders are the owners of the corporation and as such they have certain rights and privileges. Common stock gives several rights to the stockholders. Stockholder enjoys right to vote, right to dividend and right to share. “Common stock holders have a residual claim on the assets and benefits of the company in the sense that debt holders are on principle entitled only to assets remaining after all prior claimants have been satisfied.” (*Sharpe, Alexander and Bailey, 1999:501*)

2. RETURN:-

Before an investor makes any kind of investment decision, the first priority of investor is to consider the amount of return. Every investor wants sufficient return from the investment. Therefore, return is the prime factor in the financial investment decision. It is the return that encourages to accept the challenge. It strengthens the will power to assume the risk. The term return is often used in our daily life also but still the conceptual meaning of return differs from one person to another. Some consider it as revenue, the other consider it as a reward while the other consider it as a profit and so on.

However, in finance return means the return from the investment on single assets or portfolio assets. Return is reward received from investment for sacrifice of present certain amount of assets. Return is motivational factor that encourages investors to sacrifice some certain amount of assets for uncertain benefit in future. The term return from capital investment is a concept that has different meaning to different investors. Some investor regards it a short term cash inflow while other perceives it high growth rate and higher growth rate of return in the long run. Still other, measures it in terms of financial ratio such as return on investment or higher on equity.

The investment may be made of more than one source of income. There are two kinds of return that investor receives from common stock. They are current yields and capital gain yield. Current yield is the cash flow divided by beginning price and capital gain means increment in the value of investment. Cash flow refers to the cash received in the regular interval (dividend for stock holder and interest for debt holder). Capital gain means the value of increment in the investment, however sometime there may be loss in the value of investment known as capital loss.

Investment may be done only one project or assets, known as single assets or portfolio assets investment may be one assets known as single assets investment and the investment done one or more than one assets at a time is known as portfolio assets. Return can be classified and studied in various terminologies that are as follows:-

A. SINGLE PERIOD RETURN:-

The return carried for a single period is known as single period return. It measures the increment or decrement of the investors wealth “The single period return is simply and cash payment received due to ownership, plus the change in the market price dividend by beginning price”(Van Horne & John 1995:09). “An investment’s single period rate of return is simply the total rate of return on investor would receive during the investment period or holding period stated as a percent of the investments at start of the holding period”(Francis, 1993:01). The holding period return measure is useful with on investment horizon of one year or less “The rate of return achieved is the composite of dividend yield and change in price”. (Fisher & Jordan, 1993:06)

Investor can obtain two kinds of income from an investment in assets. They are :-

1. Cash inflow income (cash dividend for stockholders, coupon interest payment for debt holders)

- Income from price appreciation or loss from price depreciation turned as capital gain or loss.

Notionally,

Single period return is expressed as:

$$\text{Return} = \frac{\text{Cash inflow (if any) + change in price of assets}}{\text{Beginning price of asset}}$$

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

Where,

R= Actual or expected return when 't' refer to a particular time period in the past or future

CF_t= Cash dividend or coupon interest at end of time period 't'

P_t= Ending market price or investment at 't' time

P_{t-1}= Beginning market price of investment at 't-1' time

From above formula we can say that the single period rate of return is the composite of current yield and capital gain yield.

Single period rate of return = current yield + capital gain yield

This above formula can utilized to determine single period rate of return when the figures are based on historical data as well as expected single period return when the investment is based on figure cash flow(dividend) and price.

Annualized rate of return are several period and can be calculated in two ways. The first one is simply to take the arithmetic average of the annual holding period return over a given period and second one, which also take into account the compounding effects of each cash receipts over different time intervals is the geometric mean rate of return.

Arithmetic mean of holding period return ($\overline{\text{HPR}}$)

$$\text{HPR}_t(\text{A. M}) = \left[\frac{\sum_{t=1}^n \text{HPR}}{n} \right]$$

Here,

HPR_t = Holding period return for 't' time

t = Time period 1,2,3,4.....n

n= No. of period.

Geometric mean holding period return (HPR):

$$\text{HPR}_t = \prod_{t=1}^n [1 + \text{HPR}]^{1/n} - 1$$

Where,

π = Product (Multiply)

B. EXPECTED RATE OF RETURN:-

The rate of return that is expected in future is known as expected rate of return. The expected rate of return is the weighted average possible return with weights being the probabilities of occurrence. The expected of return is based upon the future cash receipts. “ The rate of return is a weighted average of the possible comes with each outcomes weight being equal to probability of occurrence” (Brigham, 1980:98). Generally the expected rate of return is applied on stock to earn over a future period because the interest rate on debt is mostly fixed.

The expected rate of return express what investors expect to receive from the stock as a rate of return in the coarse of next period. Many investment decision are based on future expectations. If the investors can describe the possible variables that will influence each of the possible rates or return and assign probabilities to those outcomes, the expected rate of return will be equal to the weighted average of the various probability distribution are used to describe possible outcomes. They are used to assign individual probabilities from zero to one to each possible outcome, not exceeding the total probability to be one.

The expected rate of return is calculated by adding all the product of expected probability of outcome.

Notational,

$$\begin{aligned} \text{Expected value } E(r)\bar{r} &= \sum_{i=1}^n P_i R_i \\ \bar{R} \text{ or } E(R) &= P_1 R_1 + P_2 R_2 + P_3 R_3 + \dots + P_n R_n \end{aligned}$$

Where,

$E(r)$ or \bar{r} or \bar{R} = Expected rate of return

R_i = Return on its possibility

P_i = Probability that the return R_i will occur

P_n = Total no of possibilities of future o ome

The above formulated are based on the probability distribution. The probability of occurrence serves as the foundation for the expected return. However, the future events are uncertain. So, the assignment of probabilities to the future event is a very difficult task.

If probability of possible outcome is uncertain, the expected rate of return may be wrong or it may make confusion to the stockholder or investors. So, another method is applied rate of return under this method, the historical or post data are used and they are assumed to have equal probability distribution to calculate the average rate of return.

The expected rate of return is obtained by dividing the total rate of return for the period by total no of year.

$$\bar{R} \text{ or } E(R) = \frac{\sum_{i=1}^n R_i}{n}$$

The average rate of return is considered as expected rate of return for the future period on the assumption that same rate of return will be prevalent in future time. Since the world is dynamic, expected rate of return may lose its accuracy. The expected rate of return based on the post average rate of return may not be regarded as a proper indicator of expected rate of return.

C. REQUIRED RATE OF RETURN:-

Required rate of return is that rate of return, an investor must earn on their investment. It is the minimum rate of return that investor must earn. The required rate of return when compared to the expected rate of return must be equal or less than the expected rate of return. If the expected rate of return. The investor will try to purchase the investment and this will drive the price upward and vice versa. When the expected rate of return is equal to be the required rate of return, it is said to be equilibrium price or correctly price. Equilibrium price generally exists fir a give investment because securities price adjust rapidly to new developments changes in equilibrium price can be bought about.

- 1> By a change in risk aversion
- 2> By a change in free rate.
- 3> By a change in the stock's beta co-efficient value.
- 4> By a change in the stock's growth rate.

D. RETURN ON SINGLE ASSETS:-

When an investor invests only in an asset the return generated from the single asset is known as return on single asset. The return on single asset may be on the basis of holding period return. The rate of return on a single asset under this method is based upon the total return realized in the form of cash receipt and capital gain divided by the initially investment amount. The return on single assets may be on the basis of expected return where the different probabilities of outcomes are multiplied to their respective return and after then added together.

E.RETURN ON PORTFOLIO ASSETS:-

Portfolio is the combination of two or more than two assets. Since the investment on only one asset is risky, the investor prefers to diversity their investment into different assets. This activity of diversifying the investment in more than one asset is known as portfolio. The portfolio is act of keeping eggs in different baskets. When portfolio assets means the combination of two or

more than two assets return on portfolio means comes from portfolio investment.

Investor have different investment opportunity but they have limited resources. So the investor have to select that opportunity which maximize the return and for a given level of risk. Therefore, it is needed to extend the analysis of risk and return through portfolio. Therefore, the two objectives of portfolio, the primary objective and secondary objective. The primary objective is to maximize return and to minimize the risk. The secondary objectives are to earn regular and stable return, safety of investment, appreciation of capital, even liquidity and tax benefits etc.

“The expected return on portfolio may be defined as weighted return on the assets which comprise the portfolio. The weights reflect the proportion of the portfolio or wealth invested in each assets”.(Joshi, 2004:134)

The general formulae for the expected return on portfolio is as follows:-

$$\overline{R}_p = \sum_{i=1}^n W_i R_i$$

Where,

W_i = The proportion or weights of the total funds invested in security i

R_i = Expected return for the security i

n = Total no of different securities existing in the portfolio

$$\text{weight} = \frac{\text{Amount of rupees invested in assets}}{\text{Total invested on the portfolio}}$$

The expected return on portfolio for two assets is given as under (i.e Assets are A,B) :-

$$\overline{R}_p = W_A \overline{R}_A + W_B \overline{R}_B$$

Where,

W_A = The fraction of the total value of the portfolio invested in the asset A or (1- W_B)

W_B = The fraction of the total value of the portfolio invested in asset B or (1- W_A)

R_A = Expected rate of return of assets A

R_B = Expected rate of return of assets B

The expected rate of return on portfolio for three assets is given as under (i.e. Assets are A,B,C):-

F. RETURN ON THE BASIS OF RISKINESS:-

Return can be assigned on the basis of risk. On the basis of riskiness of an assets, return can be divided into two parts:-

1. *Risk free rate of return.*
2. *Market rate of return.*

1. Risk free rate of return is the rate of return which is sure to be received. Generally Government issues Treasury note and interest provided on this security, is known as risk free rate of return. Generally the risk free rate is lower than market rate of return.
2. The market rate of return is based on the risk free rate of return. But since there is a though competitor in the market, the risk is also prevailing in the market. So the market rate of return gives higher rate of return than risk free rate of return. Generally, market rate of return constitutes of risk rate and market risk premium.

3. RISK:-

Risk is one of the most important criteria for investment decision. Risk present virtually in every decision. Although the term risk is used in our daily life and is felt by every individual, no one has been able to give the universal acceptance definition of risk. Different person perceives the risk in different ways and they define according to their own experience and perception. Some perceive it as a fluctuation in market price of the investment while other considers it as an uncertainty of return. View of the most people risk defined as chance of loss. In reality, risk occurs when we cannot be sure about the outcome, i.e investment can produce more than one outcome in future. In real

world, we cannot predict or forecast the future. Therefore every investment has some degree of risk exists because of disability of the decision maker to make prefer forecast. Forecast cannot be made with the perception or certainties since the future event on which they depend are uncertain in this dynamic world. Some investor compares it as variable of return from those they are expected.

Thus, the risk is defined as change of receiving an actual return other than expected, which simply means there is variability in the return or outcomes from the investment. (Weston and Basely, 1996:182, 183)

Thus, the risk can also be defined as a financial loss or more formally the variability of returns associated with a given stock.

“ The riskiness of an asset is defined in terms of likely of future return from the assets” (Sharma, 2001: 290)

In Webster’s dictionary, risk is defined as a hazard, a peril, and express to loss or injury.

Risk is the fate of life, which is a product of uncertainty and its magnitude depends upon the variability in uncertain cash flow. Risk is an indication of losing investment value. Therefore risk is defined as the like-hood that the actual return and investment will be less than forecast return stated differently. It is the variability of return from an investment. (Hampton, 1996:343)

In this way, risk is defined as in different ways. Some express it as loss, injury or damage, uncertainty, return validity, variability of return, outcomes variation, dispersion of return and so on. Only the term used by the people are different. Though the different people perceive or express the risk accordingly to their own perception or experiences, the risk is what the risk bearer and investor believes and experiences.

3) a. SOURCES OF INVESTABLE RISK:-

Every investment has uncertainties. Uncertainties makes future investment return risky. The sources of uncertainty that contribute to investment risk are as follows:

1. INTREST RATE RISK:-

It is the potential variability of return caused by changes in the market interest rates. If market interest rates rise, then investment values and market prices will fall and vice versa.

The variability of return that results is interest rate risk. This interest rate risk affects the price of bonds, stocks etc.

2. PURCHASING POWER RISK:-

It is the variability of return an investor suffers because of inflation. Inflation or a rise in general price over time seems to be normal way of life in most countries today. However, when inflation take place, financial (such as cash, stock and bonds) may lose their ability to command the same amount of real goods and services they did in the past. To put another way, the rate of return on financial assets may not adequately compensate the holder of financial assets for inflation.

3. BULL-BEAR MARKET RISK:-

This risk arises from the variability in market return resulting from alternating bull and bear market forces.

When a security index rises fairly consistently from a low point, called a trough for a period of time, this upward trend is called a bull market. The bull market ends when the market index reaches a peak and start a downward trend. The period during which the market declines to the next trough is called a bear market.

4. DEFAULT RISK:-

It is the portion of an investments total brisk that from changes in the financial integrity of the investment.

5. LIQUIDITY RISK:-

It is the portion of an asset's total variability of return that result from price discounting given or sales commission paid in order to sell the assets without delay perfectly. Liquidity assets are highly marketable and suffer no liquidation costs liquid assets are not readily marketable, either price discounting must be given or sales commissions must be paid or both of these cost must be increased by the seller.

6. CALLABILITY RISK:-

Some bond and preferred stock are issued with a provision that allows the issuer to call them for repurchase.

The portion of a securities total variability of return that derives from the possibility that the issue may be called is the call ability risk.

7. CONVERTIBILITY RISK:-

Convertibility risk is that portion of the total variability of return from a convertible bond or convertible stock.

8. POLITICAL RISK:-

The portion of an assets total variability of return caused by changes in the political environment (for example: a new tax law) that affect the assets market value

9. INDUSTRY RISK:-

An industry is a group of companies that compete with each other to market a homogeneous product. Industry risk is that portion of an investment's total variability of return caused by event that effect the products and firms that make up an industry.

3) b. MEASUREMENT OF RISK:-

The measurement of risk has always been a subject for debate in the investment industry. Risk is sometimes distinguished from uncertain. Risk is

referred to the situation where the probability distribution or the cash flow on investment proposal is known on the other hand there is no information to formulate a probability distribution of the cash flows the situation is known as uncertainty.

PROBABILITY ASSIGNMENT

Probability may be defined as a measure of some ones about the likelihood that an event will occur. If the event is certain to occur, we say that it has probability of occurring, if an event is certain not to occur. We say that its probability of occurring is zero. Probabilities can be used to assess more precisely the risk involved in an asset. Probability distribution may be defined as a set of possible values that a random variable can assume their associated probabilities of occurrence. Probability distribution may consist of only a few estimates one commonly used from employs only the high, low and best guess estimates or optimistic, most likely and pessimistic estimates. Probabilities can also be the possible outcomes from an investment. The tighter the probability distribution of expected future return, the smaller the risk of a given investor. Risk can be measured in the following terms:-

A. STANDARD DEVIATION-

Risk is defined as variability of return from an investment. Various factors play an important role to bring such variability or deviation, such variability is stability measured by standard deviation. Standard deviation is the absolute measure of degree of risk of common stock. We can measure the risk by examining the tightness of probability distribution associated with the possible outcomes. It is widely used to measure risk from holding a single asset. The smaller the standard deviation, tighter the probability distribution and accordingly, the lower will be the riskiness of an investment.

Standard deviation is the square root of variance and it is denoted by σ ,

$$\sigma = \sqrt{\text{Var}(r)}$$

In statistical terms, standard deviation is defined as square root of sum of products of the required deviation of each possible rate of return from the expected rate of return multiplied by the probability that the rate of return

occurs. The greater is the standard deviation of a probability distribution, the greater is dispersion of outcome around the expected value. Standard deviation is measure that indicates the degree of uncertainty of return and is one important measure of risk. Smaller the standard deviation lower the risk, higher the standard deviation higher the risk.

Symbolically,

$$\sigma = \sqrt{\sum (R - \bar{R})^2 * P_i}$$

Where,

\bar{R} = Expected rate of return

R = Rate of return

P_i = Probability occurring R_i return

B. VARIANCE:-

Variance means the variation of return from the expected return. It measures the volatility of return. The concept of variance is highly important in advanced work where it is possible to split the total into several parts each attributable to one of the factor causing variance in their original series. The variance is well known among statistician several hand calculator and computer are programmed to calculate it. The variance of an assets of return equals the sum of product of the required deviation of each possible rate of return from the expected rate of return multiplied by the probability that rate of return occurs.

Symbolically,

$$\text{Var}(R) = \sum_{i=1}^n P_i [R_i - E(R_i)]^2$$

Where,

Var(R) = variance of return

R_i = Rate of return for the i^{th} possibility

$E(R_i)$ = Expected rate of return

P_i = probability occurring R_i return

n = Total no of possibilities

C. COEFFICIENT OF VARIATION:-

The standard deviation and variation are equally acceptable and conceptually equivalent quantitative measure of an assets of total risk. The standard deviation can sometime be misleading in comparing the risk of uncertainty surrounding alternative if they differ in size. To adjust for size or scale problem. The standard deviation is divided by the expected rate of return is called coefficient of variation. Coefficient of variation is a relative measure of risk. Coefficient of variation measures per unit risk.

$$CV = \frac{\delta}{E(R)} \text{ or } \frac{\delta}{\bar{R}}$$

Where,

CV = coefficient of variation

δ = standard deviation of return

\bar{R} = Average rate of return

E(R) = Expected rate of return

Since CV shows the risk per unit it provides more meaningful basis for comparison when the expected return on two alternative are not same. It is useful measure of risk to compare the project which have same standard deviation. Higher the coefficient of variation indicates that coefficient has more volatility of return which signifies the higher risk and lower the coefficient of variation indicates the less volatility of return, which signifies the lower risk.

3) c. TYPES OF RISK:-

Risk can be defined on the basis of its avoidance. Total risk is measured by the standard deviation. Total risk composition of systematic risk and unsystematic risk.

1. SYSTEMATIC RISK:-

Systematic risk is risk caused by the different factor that effect over all market economy such in the nation's economy, tax reforms made by

government or state or change in world energy situation, interest rate gross domestic product, investors expectations. More over it cause of external environment. Since it cannot be diversified, it is also called non-diversifiable risk. “ Systematic risk is variability of return on stock’s or portfolios associated with change in return on market as whole” (Van Horne, John, 1997:100) the beta coefficient is an index of systematic risk. This is a modern scientific technique of measuring a security risk. It is an indicator of relationship between an individual investment return and general market return.

Beta coefficient of a stock will be less than equal to or more than 1(one) but the beta of a market will be always 1. An investment which has a beta suppose 1.5 indicates the stock has greater fluctuation than the market portfolio. In the simple word, we can say that if the return on portfolio is expected to increase by 10%. The return on security with beta of 1.5 is expected to increase by (10%*1.5) on the other hand a security has the beta of suppose 0.9 indicated that fluctuates less than market portfolio. If the market portfolio is expected to rise by 10% the return on the stock with beta 0.9 is expected to rise by 9%(09*10). Individual securities beta generally falls between the range of 0.60 to 1.80 and rarely. If ever, assume a negative value.

In this way, beta indicates the relation between an individual investment return and market return. Statistically, beta defined as their stock with the market proxy portfolio return divided by the variance of market proxy return.

Mathematically,

$$\beta_j = \frac{\text{cov}(R_j, R_m)}{\delta^2_m} = \frac{\text{cov}(R_j, R_m)}{\text{Var}(R_m)}$$

Where,

B_j = Beta coefficient of security j

$\text{Cov}(R_j, R_m)$ = Covariance between the return of security j and market portfolio.

δ^2_m or $\text{var}(R_m)$ = variance of return on market portfolio

2. ASYMMETRIC RISK:-

Asymmetric risk is the part of the total risk which can be diversified and usually arises due to the managerial inefficiency. This type of risk is unique to the organization of investment. So this type of risk is also known as diversifiable risk. Diversifiable risk creates through events like labor strikes, management errors, invention, advertising campaigns, lack of availability of raw materials etc. Asymmetric risk is the variability of return on stock or portfolios not explained by general market movement. It is avoidable through diversification. "For most stocks asymmetric risk account for between 60 to 70 percent of the stock total risk or standard deviation." (Van Horne & Wachowitz 1997:100)

The asymmetric risk comprises of business and financial risk. Business risk is related with the assets efficiency. Financial risk is related with financial aspect of the company.

Asymmetric risk = Financial risk + Business risk

Asymmetric risk → arise due to the company or industry

Financial risk → arise due to Financial leverage

Business risk → arise due to assets operational problem

RELATIONSHIP BETWEEN SYSTEMATIC & UNSYSTEMATIC RISK:-

Total risk = systematic risk(non-diversifiable)+ unsystematic risk(diversifiable)

$$Var(R_i) = b_i^2 * Var(R_m) + Var(e)$$

Where,

Var(R_i) = variance of return on "i" security

b_i = Beta coefficient of security

Var(R_m) = variance returns in the market

Var(e) = residual variance or asymmetric risk

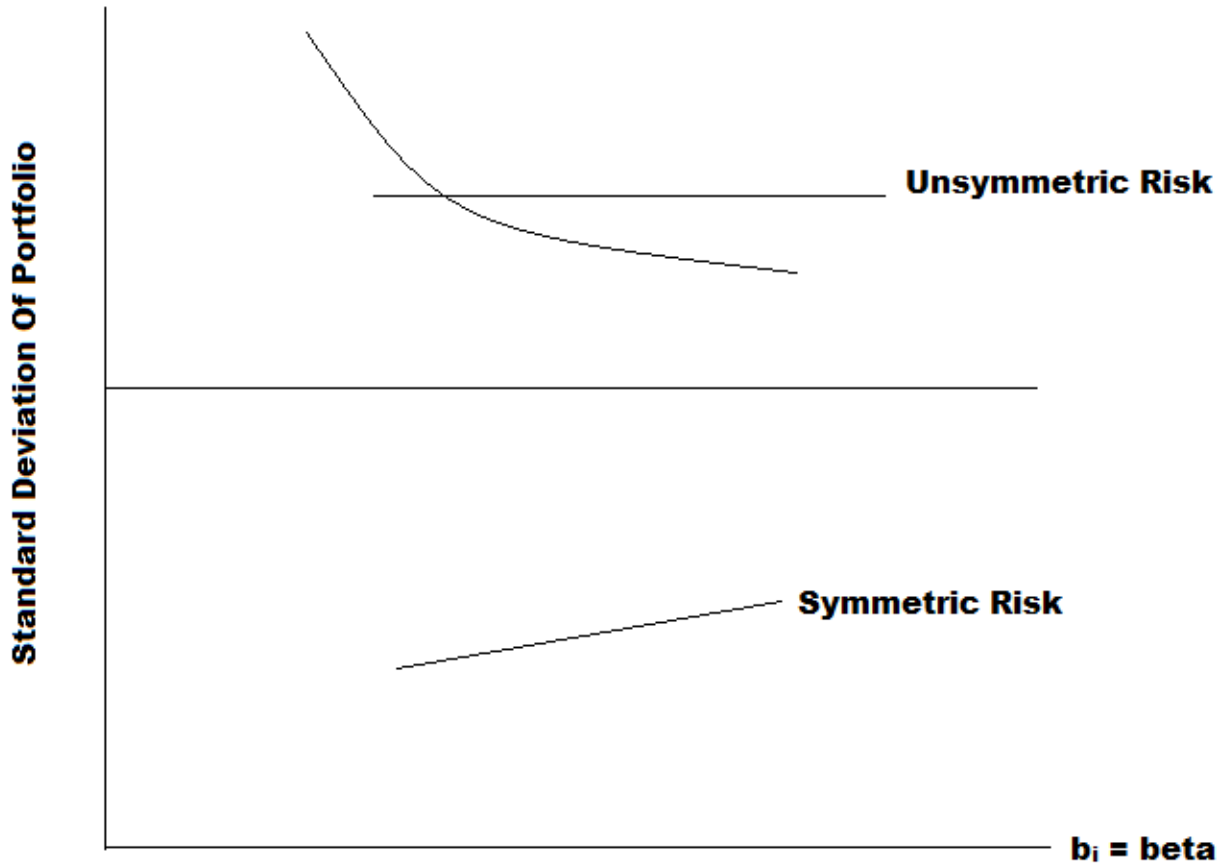


fig 2.1

No of securities in portfolio

Investor invests in only one stock of the company composed of total risk that includes both symmetric risk and asymmetric risk. The portion of asymmetric risk can be eliminated by diversification of investment in many company. If the no of security I the portfolio increases , the total risk occur will be decreased and finally reached to the level of symmetric risk.

3) d. THEORIES OF RISK AND RETURN:-

The theories which are based on the concept of risk and return are known as risk and return portfolio theory. CAPM (Capital Assets Pricing Model) and APT (Arbitrage Pricing Theory) are most common and important theories of risk and return. The theories are described under given below.

A. PORTFOLIO THEORY:-

The process of selecting an optimum portfolio is known as portfolio theory. As discussed earlier portfolio is combination of individual or a group of assets. There are two objectives of portfolio, one is primary objective and another is secondary objective. Primary objective of portfolio minimizes the risk and maximizes the return whereas the secondary objective is regular and stable return safety of investment, appreciation of capital, tax benefits etc.

Risk aversion :- Investors are risk averse. They prefer higher risk to lower risk and higher return to lower return.

Return :- The return expected from any assets or portfolio is the mean value of probability distribution of future return.

Risk :- The variability of return from the expected return is the risk that is to be tolerated by an investor.

Utility :- The determinant factor of risk and return is the utility curve or indifference curve that states the investor bearing high risk requires more return than lower risk bearing investor.

Principle of dominance :- The investor follows the principle of dominance i.e if there is same level of return, lower risk is preferred and their level of risk higher return is preferred.

A) 1. PORTFOLIO RETURN:-

Portfolio is the combination of two or more than two assets. The return gained from the investment in two or more than two assets or investment is known as portfolio return. Portfolio return means weighted average of return and proportion of investment on assets. Portfolio return always depends upon the individual rate of return and the ratio of investment those assets. The expected return on a portfolio may be defined as the weighted average of the expected return on the assets which comprise the portfolio. The weight reflects the proportion of the portfolio or wealth invested in each assets.

$$E(R_p) = \sum_{i=1}^n W_{ij} E(R_{ij})$$

For two assets :-

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

For more than two assets :-

$$E(R_p) = W_i E(R_i) + W_j E(R_j) + \\ \dots \dots \dots + W_n E(R_n)$$

Where,

$E(R_p)$ = Expected return for portfolio

W_i = Weight Investment in (i) assets

W_j = Weight Investment for (j) assets

$E(R_i)$ = Expected return for (i) assets

$E(R_j)$ = Expected return for (j) assets

n = Total number of assets containing in portfolio

A) 2. PORTFOLIO RISK:-

The risk arise from the investment in more than one asset is known as portfolio risk. In other words, the variation in expected return from investing in two or more than two is known as portfolio risk. Thus the portfolio risk depends upon the three basic factors. The first one being individual risk of an assets, second one being the proportion or weight of investment in each assets and third is the relation between the co-movement return of assets among the portfolio known as covariance or co-relation. Portfolio return means only the weighted average of the return and proportion investment but portfolio risk means combination of individual assets risk proportion of investment and nature of return of those assets forming portfolio. Portfolio risk is the variance of portfolio return. The variance of portfolio reflects not only the variance of the assets that make up the portfolio but also how the returns of the assets that comprise of the portfolio, vary or more together. The nature of such co-movement of return is called co-variance.

Portfolio risk is measured by a statistical tool standard deviation and variance. It is a function of the proportion invested in the components. The

riskiness of the components and co-relation on the components securities. This risk is computed by using the following equations:-

Mathematically,

$$\text{Var}(r_p) \text{ or } \delta p^2 = \sum_{i=1}^n \sum_{j=1}^n W_i W_j \text{cov}_{ij} \text{ or } \sum_{i=1}^n \sum_{j=1}^n W_i W_j \rho_{ij} \delta_i \delta_j$$

For two assets portfolio:-

A) 3. RISK MINIMIZED PORTFOLIO:-

It is difficult task to determine the amount of money investment to from a portfolio, the ratio of investment on each assets that minimizes the risk to its lowest form is known as risk minimizing portfolio. The ratio of investment is known as optimum weight.

In case of two assets, the percentage of weight of fund investment in each assets is obtained by the following formula:-

Weight of investment is assets A:-

$$W_A = \frac{(\sigma_B)^2 - r_{AB} \sigma_A \sigma_B}{(\sigma_A)^2 + (\sigma_B)^2 - 2r_{AB} \sigma_A \sigma_B}$$

OR

$$W_A = \frac{(\sigma_B)^2 - \text{COV}_{AB}}{(\sigma_A)^2 + (\sigma_B)^2 - 2\text{COV}_{AB}}$$

Or, $W_A = (1 - W_B)$ (if weight of investment B is given)

Weight of investment is assets B:-

$$W_B = \frac{(\sigma_A)^2 - r_{AB} \sigma_A \sigma_B}{(\sigma_A)^2 + (\sigma_B)^2 - 2r_{AB} \sigma_A \sigma_B}$$

OR

$$W_B = \frac{(\sigma_A)^2 - \text{COV}_{AB}}{(\sigma_A)^2 + (\sigma_B)^2 - 2\text{COV}_{AB}}$$

$$\text{Or, } W_B = (1 - W_A)$$

Where,

σ_A = standard deviation of assets A

σ_B = standard deviation of assets B

r_{AB} = correlation coefficient between the return of Assets A and B

COV_{AB} = covariance between the return Assets A and B

The weight of fund in each (assets A or B) calculated from the above formula helps to identify the optimum weight for risk minimizing portfolio in case of two assets.

A4. PORTFOLIO SECTION:-

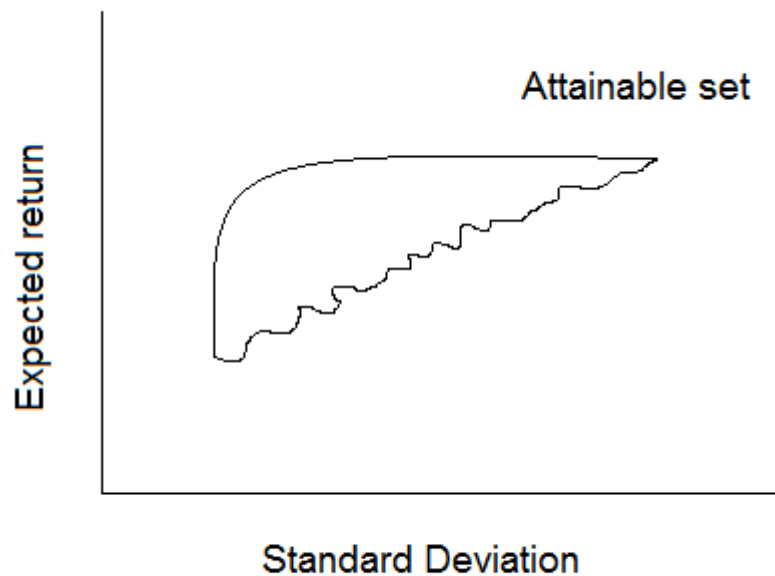


Diagram No:- 2.2

When it is cleared that the portfolio helps to minimize the risk, the investors look for the assets combination that can be attainable. From the available assets the limitless number of portfolio can be performing. Each possible portfolio will have an expected rate of return and risk. The

hypothetical set of all possible portfolio performs is called the portfolio opportunity set or attainable set as shown in the above diagram.

A5. DETERMINATION OF EFFICIENT FRONTIER OR PORTFOLIO:-

In the portfolio theory, the principle of dominance exists and the portfolio which has the highest expected return for a given level of risk and the minimum risk for a given level of return is called an efficient portfolio.

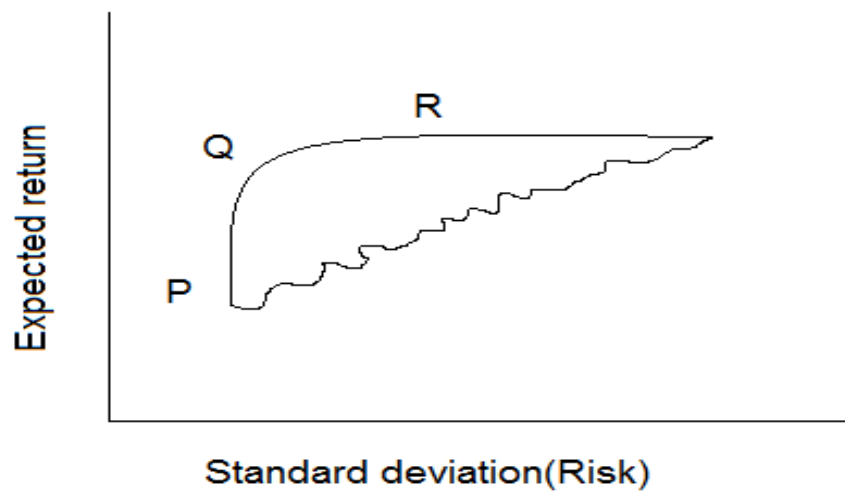


Diagram No:-2.2

From the figure the three portfolios (P, Q and R) are recognized as the dominant assets. In the figure, line PR is the efficient frontier and it represent the locus of all portfolio which has the highest return for a given level of risk. Portfolios that lie below the efficient frontiers are the dominated portfolios. Portfolios that lie to the left side of the efficient frontier are not possible because they lie outside of the attainable set. Portfolio to the right side of the efficient frontier are inefficient because some other portfolio could provided either a higher return with the some degree of risk or lower risk the same level of return.

Comparing among the efficient frontier P, Q and R portfolio has low risk and low return. Portfolio Q has higher risk and higher return. Similarly, portfolio R has high risk and low return as compared to portfolio Q. so portfolio Q dominates portfolio R. in the figure the line PR is the efficient

frontier and represents the locus of all portfolio that has the highest return for a given level of risk.

Thus in the above figure both portfolio P and Q are efficient portfolios. Portfolio has low risk and high return.

B. CAPM (CAPITAL ASSETS PRICING MODEL):-

CAPM is a model that describes the relationship between risk and expected return. It explains the behavior of a security price. It also describes how the price and interest rate on risk financial assets are determined in the capital market. In this model, a security's return (Expected return) is the risk free rate plus a premium based on the systematic risk of the security, where the risk is measured by the beta coefficient.

Harry M. Markowitz laid down the fundamental modern portfolio theory in 1952. capital assets are long term financial as well as real assets and CAPM is based on the pricing of assets. Modern portfolio theory of Markowitz suggested that investment decision should be based on the total risk and price of assets should be determined on the basis of total risk. But the CAPM suggested that any investors can create a portfolio of assets that will eliminate virtually all diversifiable risk, the only relevant risk is non diversifiable risk. Therefore, the investment decision and pricing of assets should be based on the undiversifiable risk. This is the primary importance of selecting assets with the most described risk and return characteristic. The CAPM further suggested that price of capital assets should be determined in a way to compensate the systematic risk.

Based on the behavior of risk averse investor there is an implied equilibrium relationship between risk and expected return for each security. In market equilibrium a compensation for systematic risk is provided to expected return. The relationship states the greater the systematic risk, greater will be the return expected from an investor.

“The major implication of the CAPM 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 CAPM. It provides the intellectual basis for a number of current practices in the investment industry” (Shape, Alexander and Bailey, 2000)

William Sharpe developed this CAPM model in 1960’s. The model is simple in concept and has real world applicability. Like any model this one is a simplification of reality. It allows drawing certain implications about risk and size of risk premium required as compensation for bearing risk.

CAPM is based on a number of assumptions. They are:-

1. **Market efficiency:** - It is assumed that capital market are efficient.
2. **Risk aversion:** - Investor are risk averse. They evaluate a securities return and risk in terms of the expected return and variance or standard deviation respectively. They prefer the highest expected return for a given level of risk.
3. All the investor have the same expectation about the expected return and risk of securities.
4. All the investor’s decision are based on single time period.
5. All the investors can lend or borrow at a risk free rate of interest (Pandey, 1997:355)

C.THE SECURITY MARKET LINE(SML):-

SML is the graphical representation of the CAPM. It shows the relationship between risk and required rate of return “SML is the line that shows the relationship between risk as measured by beta and the required rate of return for individual securities”. (Western and Brigham p 208). The CAPM is an equilibrium model for measuring the risk and return trade for all assets including both efficient and inefficient portfolios.

The SML clearly shows that return are the increasing function, in fact a linearly increasing function of risk line shows that if the risk increase the return should also increase proportionally the risk affecting the return is market risk.

A figure for CAPM is presented below

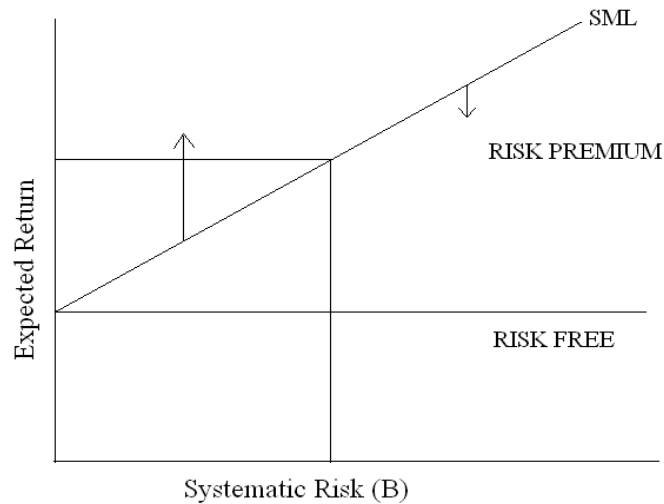


Diagram No.2.3

In the figure, the expected one year return is shown on the vertical axis. At zero risk the SML has intercept on the vertical axis equal to risk free rate. The return is presented even in the situation of zero risk for the compensation to the time value of money as risk increases the required rate of return increases in the manner as shown in figure.

The figure of CAPM describes two assets A and B that are not in equilibrium. Assets A is undervalued and therefore a very desirable assets to invest. Assets A price will rise in the market as more investors are altered to purchase it however as A's price goes up its return falls when A's return falls to certain consistent with its beta on the SML equilibrium is attached. In case B, just the opposite situation takes place. Investors will attempt to sell B because of its overvalued and therefore this put down pressure on its price. When the return on assets B increases to the rate that consistent with the beta risk level given by SML equilibrium will be activated and downward price will lose its existence.

The expected rate of return on SML can be presented in following equation

$$E(R_i) = R_f + (R_m - R_f)\beta_i$$

Where,

$E(R_i)$ = Expected return for an (i^{th}) assets

R_f = Risk-free rate of return

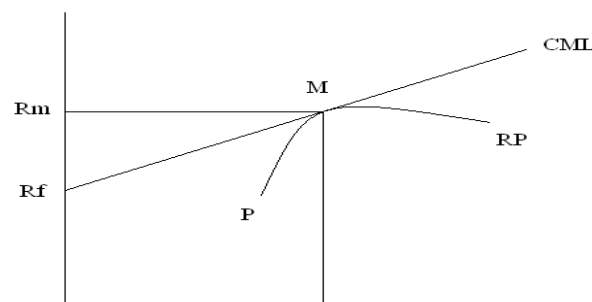
R_m = Expected market return

β_i = Systematic risk of an assets

D.CAPITAL MARKET THEORY(CML):-

CML represents the equilibrium relationship between the risk and return (expected) for the efficient portfolios. CML is the theory of risk and return used to describe the relationship between risk and return in market portfolios and the risk free rate of return. Thereby defining widely held conception of the price of risk and the price of immediate consumption. The theory describes the price as a reward to the seller. In fact, when a risk free assets is introduced into Markowitz portfolio analysis. The efficient frontier change from a curve to a straight line. This new efficient frontier is called capital market line(CML).

Portfolio Standard Deviation (δ)
Diagram 2.4



The CML starts with the risk free assets (RF) that is tangent to a risky portfolio (M) on the market efficient frontier. In the above figure portfolio on M is the only risky portfolio. To the left side of M present on CML will hold both the risk free assets and risky portfolio.

The slope of CML can be represent as follows :-

$$\text{slope of CML (R}_p\text{)} = R_F + \frac{R_m - R_F}{\sigma_m} \times \sigma_p$$

Where,

\bar{R}_p = Required rate of return on any efficient portfolio on the CML

R_m = Expected rate of return on market portfolio

RF= Risk free rate of return

σ_m = Standard deviation of return on market portfolio

σ_p = Standard deviation of return on efficient portfolio

This equation states that the required return on only efficient portfolio in equilibrium equals on any efficient portfolio in equilibrium equals to the risk free rate plus the market price of risk multiplied by the amount of risk on the portfolio being considered.

E. RELATIONSHIP OF SML AND CML:-

After the study of SML and CML, the relationship between SML and CML can be established. CML and SML are only the different drawings of the same market equilibrium. SML is used to explain the required rate of return of all securities whether or not they are efficient and presents a unique relationship between systematic risk and expected return. On the other hand, CML is used to explain the required return only for those efficient portfolios that are perfectly corrected with the market portfolio because those assets fall on the CML.

The relationship between SML and CML are expressed as :-

$$\text{Equation of (CML) } E(R_p) = R_F + \frac{[E(R_m) - R_F]}{\delta_m} * \delta(R_p)$$

$$\text{Equation of SML } E(R_i) = RF + [E(R_m) - RF]\beta_i$$

Considering the definition of beta,

$$\beta_i = \frac{\text{cov}(R_i R_m)}{\text{var}(R_m)}$$

SML equation can be expressed as

$$\text{SML} = E(R_i) = RF + \frac{[E(R_m) - RF]}{\delta_m} \frac{\text{cov}(R_i R_m)}{\delta_m}$$

Where,

$E(R_i)$ = Expected rate of return of 'I' assets

R_p^- = required rate of return on any efficient portfolio on the CML

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

RF = Risk free rate of return

δ_m = Standard deviation of return on market portfolio

$\text{Cov}(R_i R_m)$ = Covariance of return between individual assets and market return

2.2.REVIEW FROM RELATED STUDIES:-

The objective of this section is to show how the relationship between risk and return is defined, described and measured by different studies. In this section we will review the previous study which is related to this topic, which is published in Journal, thesis independents.

2.2.1REVIEW FROM JOURNAL:-

There are very few books and resources based on Journal in the field of finance. In Nepalese context almost no any articles about the risk and return analysis on common stock investment can be funds. Nowadays information highway or the internet has become the most easily accessible medium to gain information in any subject matter. So, some foreign Journals taken into account to review the risk and return topics.

There is an article “The Theoretical relationship between systematic risk and financial variable” by Robert b.Bownna. the purpose of the study was to examine the relationship between the risk and financial variability and market risk. Systematic risk is directly related to the accountancy better. There is no theoretical relationship between dividend and systematic risk and also size and growth of the firm and systematic risk. “This study shows that there is a theoretical relationship between systematic and firms accounting beta. This function is not only the function of earning variability dividends and policies but also size and growth of firm”. (*Bowmon, 1979:617-628*)

The journal of finance published by monthly by American Finance Association for many decades is considered. In august 1999, an article entitled “Local return factors and turnover in emerging stock markets” by k Greet Rawan Horst was published, which is received here. “The performance of Hedge Funds: risk, return and incentives” by *Carl Ackermann, Richard M.C., Enally and David Revenscazft* has been reviewed here.

These hedge funds concluded that the flexible investment options employed by hedge funds mark it difficult to classify hedge funds, identity the correct bench mank and this measure the relative performance. Standard deviation of return measure of total risk may not fully capture the complex risk taking from hedge funds dynamic, highly reversed strategic monthly incentive fees, therefore contain an unknown reporting bias that may be as important as depreciation rates, common cost allocation and transfer pricing issues in accounting profits” (*Clark, Richard and Crof, 1999:850*)

2.2.2 REVIEW FROM RELATED STUDIES:-

In Nepalese context very few independent studies can found in the topic of finance. However, the available independent studies which are related to Nepalese market views expressed by different person in their article regarding risk and return of common stock of commercial banks are presented or received have I the topic.

Narayan Prasad Poudel study carried in the topic of investing shows of “Return and risk elements” in 2001, from mid July of 2001. the main objective of the study is to determine whether shows of commercial banks in Nepal are over or under priced by analyzing risk and return characteristics of individual shares.

Mr. Poudel has given the following findings:-

- ❖ From the study we get Nepal Arab Bank Ltd., Indo-Suez Bank Ltd (Investment Bank Ltd.) and Himalayan Bank Ltd. were overpriced and other were under price.
- ❖ Most of individual shows appears to be defensive as beta coefficient were less than one. Low beta shares were less volatile than market as whole only the return of share of Bank Of Kathmandu had beta coefficient of greater than one indicating that share was more risky than the market.
- ❖ Nepal Arab Bank Ltd., Nepal Indosuez Bank Ltd., Himalayan Bank Ltd. had higher expected equilibrium return than expected rate of return and Standard Chartered Bank Ltd., Nepal SBI Bank Ltd., Nepal Bangladesh Bank Ltd., Bank Of Kathmandu had lower equilibrium return than expected rate of return.

Another independent study carried out by Pro. Dr. Radhe Shyam Pradhan in 1933 carried out a study entitled “stock market behavior, an small capital market and case study in Nepal” (Pradhan,1993:23-49). This study was based on data collected from seventeen enterprises from 1986 to 1990. one of the major objectives which are related to this study was “ to assess the stock market behavior in Nepal”

Mr. Radhe Shyam Pradhan has given the following findings:-

- ❖ Dividend per share and market price per share was positively co-related

- ❖ There are positive relationship between dividend payout and liquidity.
- ❖ Higher the earning on stock larger the ratio of dividend per share to market price per share.

2.2.3 REVIEW FROM THESIS:-

There are some studies to topic “risk and return” had been conducted as a thesis for the partial fulfillment of Master’s degree in Tribhuvan University which are reviewed here. These are the same studies related to this topic such as the study conducted by Mr. Durga Bhattarai in 2004 entitled “Risk and Return Analysis of Common Stock Investment” with special reference to commercial banks. By Mr. B.R Tamang in 2003 entitled as “ Risk and Return Of Commercial Bank in Nepal”, unpublished MBA thesis T.U Kritipur (reference of P.G campus in BRT) by Parshuram Neupane in 2003 entitled as “Risk and Return Analysis” with reference to listed commercial banks, by Mr. Jeet Bdr. Sapkota in 2000 entitled as “Risk and Return Analysis in Common Stock Investment”, Mr. Binod Kumar Yadav in 2008 entitled as “Risk and Return Analysis of Commercial Bank in Nepal”, by P.Ghimere in 2005 entitled as “Portfolio Management of Nepal’s listed companies” are review here.

The study conducted by Mr. Durga Hari Bhattarai was included seven listed commercial banks with data from financial year 1998/1999 to 2002/2003. The main objective of the study was “risk and return analysis of commercial stock investment with special reference to commercial bank” (Bhattarai, 2002). There is deep relationship between risk and return. It plays a vital role in the process of investment. However the relationship between risk and return is described by investors perception about risk and their demand for compensation. The investors will invest in risky assets only when he is assured of adequate compensation for risk bearing.

On the basis of finding, Mr. Bhattarai derived following conclusion:-

- ❖ Price of share is determined by economic condition policy of government peace and political situation of nation.

- ❖ Investor can invest in such companies whose coefficient of variation of return of common stock is invest.
- ❖ To minimize the risk, investor should invest their fund in various companies.
- ❖ The under priced common stock should be purchased and over priced common stock should be sold.
- ❖ NEPSE should improved information technology and expand many branch in other main cities around country.
- ❖ Real financial statement should be provided by financial institution.
- ❖ Government should also monitor the activities of financial institution.

From the study of Mr. Bhattarai research it can be said that the focus has given to the analysis of risk and return in common stock investment. Due to various other aspects of analysis investor cannot easily assess the result. The study has not focused the view point of investor and concentrated on the companies and stock market. However, this study has explored some dimension for the further research in this subject.

Another thesis submitted by Mr. Parshuram Neupane in 2003 entitled risk and return analysis with reference to listed commercial banks is also related to this study

In this study he has taken six commercial banks in account and has given the following conclusion. “The return is the income received on stock investment

Which is usually expressed in percentage. Expected return on the common stock of SCBNL is maximum i.e. 60%, which is very high rate of return. In reality this rate is only exists due to effect of unrealistic annual return because issue of bonus share increase in share price. Similarly expected rate of return of common stock of Himalayan Bank Ltd is found minimum i.e. (28.94%) about the risk he has concluded, “Risk is the variability of return which is measure in terms of standard deviation. On the basis of S.D., common stock of NABIL is most risk since it has high S.D. and common stock of HBL is least risky because lowest S.D. on the other hand we know that C.V. is more

national basis of investment decision which measure the risk per unit of return on the basis of C.V, common stock of NABIL is best 0.86 unit of risk per unit of return. But common stock of NABIL has the highest risk per unit of return i.e 1.2719 (Neupane, 2003)

Another study of Mr. Jeet Bahadur Sapkota in 2000, entitled as “Risk and Return Analysis in Common Stock Investment” is very closely related to this study. Researcher's main objective of the study is to change the risk and return of common stock in Nepalese stock market. This study is focused on the common stock of commercials banks.

Mr. Sapkota in the study has conducted that “common stock is the most risky security and lifeblood of stock market because of high expected return common stock attracts the more investor. Private investor plays a vital role in the economic development of nation by mobilizing the dispersed capital remained in different form in the society. As over all economy, Nepal’s stock market is in emerging state. Its development is accelerating since the political change in 1990 effect the openers and liberalization in national economy. but the lack of information and poor knowledge, Nepalese private investor cannot initialize the security as well as market properly. (Sapkota 2000:89)

Above journal, independent studies and their by different author are presented here in this chapter knowledge relating to the topic has been achieved and those studies provided curial cases for research purpose.

CHAPTER THREE

RESEARCH OF METHADODOLOGY:-

The research methodology is the systematic way of solving research problem. Research methodology refers to the overall research process which on researcher conducts during his/her study. Research methodology basically describes the method process tools and technique applied in the entire process of scientific research, “Research methodology is a way to symmetrically solve the research problem” (Kothari,2001:10). At most of data are quantitative, the research is based on the scientific models. To acquire the research objective a good research methodology has to be followed. It is the composed of both parts of technical aspect and logical aspect on the basis of historical data. Research is symmetric and organized effort to investigate a specific problem that need a solution. This process of investigation involves a series of well thought out activities of gathering, recording, analyzing and interpreting the data with the purpose of finding answer to be problem is called reserved.

The research methodology adopted in study to accomplished the objective of the study on risk and return analysis of common stock investment in commercial banks. Research can be conducted on the basis of primary and secondary data. Here in the study all the data are secondary data and the observed data are analyzed with using appropriate financial and statistical tools outcomes are presented in simple way. Detail research method are described in following headings.

3.1 RESEARCH DESIGN:-

The research is based on the recent historical data. So, simply it is historical research. Research design may be defined as framework, plan and structure for calculating, analyzing and evacuating data. The research design focus on the data collection method, the tools utilized for the research and sampling plan to be followed controlling the study.

Thus the research design is an integrated frame that guides the researcher to plan and execute the research work. The research design is the plan and structure supported by the strategy of investigation conceived in order to obtain answers to research queries and to control the variance.

The research study attempt to analyze the position of risk and return of the selected commercial banks. For the analysis, data are obtained from Nepal Stock Exchange website www.nepalstockexchange.com. As research is based on historical data. It covers the six year data from fiscal year 2001/002 to 2008/009. The pattern of return and volatility are analyzed in the study. The trend of return of each commercial bank is also studied. More than that the relationship between mean return, standard deviation and the coefficient of variation are examined to find whether the relationship between these variables in the study is positive or negative. The test of correlation and analysis of variance are also done in this study. Therefore, the research design used in the study is basically descriptive analytical in nature.

3.2 POPULATION AND SAMPLE:-

Population is the combination of each unit. It is also known as universe of the study. “The word ‘universe’ is used in statistics denotes the aggregate from which the sample is to be taken”. (Gupta, 1995:E-42). Population may be finite or infinite. A finite population is one in which the number of items is determinable. An infinite is that in which the number of items are not determined. Our study has finite population. In many cases, the study of the whole population is neither feasible nor desirable. In this case, samples are taken for the study. Sample is the representative of the population. It is the part of universe, which the researcher selects for the purpose of investigation. The sample should exhibit the characteristics of the population. It should be a small population sample is a subject of population units process of choosing a sample from the population to learn about the population on the basis of sample is known as sampling. For our purpose, the financial statement of commercial banks are regarded as population. There are 29 commercial bank till the

research work. Among these, five commercial banks are taken as example for the study namely SBI, NABIL, EBL, SCBNL and HBL. These samples are selected according to the judgmental and convenience sampling.

3.3 NATURE AND RESOURCE OF DATA:-

It is the data on which the analysis is done evaluated the results are obtained. Data is the foundation on which the research is performed.

There are two sources from which the data can be collected namely the primary sources of data and secondary source of data. A primary source is one that itself collects the data, primary data are those which are collected at fresh and first time and those happen to be original in nature. The researcher directly goes to the field and collects necessary information for the study by observation interview with the concerned one. Secondary data source is one that makes available data were collected by some other agency. Secondary data are those which has already been passed through statistical process. They are collected from various published and unpublished sources and were already been used by researcher.

The study is mainly based on the data tabulated from financial statement of selected banks for the study for the period of five year i.e 2001/002 to 2008/009 which have been derived from NEPSE website (www.nepalstock.com). Also the annual reports of concerned bank data related to the market price of stock market capitalization, movement of NEPSE index etc is taken from trading report published by NEPSE and the website of Nepal Stock Exchange. Therefore data for the study have been primarily secondary in nature. During the study informal opinion survey has also been taken with the individual investors security board of Nepal, staff of Nepal stock exchange.

3.4 TECHNIQUES OF ANALYSIS:-

For the study descriptive and inferential techniques are applied as techniques of analysis. Descriptive analysis is based on profitability ratio. Standard deviation and coefficient of variation. The trends of return, trend

equation with their predicted values are also computed. Apart from this Karl Pearson's coefficient of co-relation is also calculated to describe the nature of relationship between risk and return.

For the inferential analysis null and alternative hypothesis were formulated and tested in ANOVA if critical value of F ratio was move then the calculated value at 5% level of significance with (N-K, K-1) degree of freedom the null hypothesis will be accepted and alternative hypothesis will be rejected otherwise vice versa.

3.5 ANALYTICAL TOOLS:-

For the analysis of data, appropriate tools are to be utilized in order to secure the required findings of the study. All those tools which are used for the analysis and interpretation of the data known as analytical tools. There are two types of analytical tools applied in the study. They are:-

1. *Statistical tools*
2. *Financial tools*

3.5.1 STTISTICAL TOOLS:-

Statistical tools include Arithmetic mean(return on common stock), standard deviation coefficient of variance, Karl Pearson's trend analysis , coefficient of variation, co-relation regression and (ANOVA)

A.ARITHMETIC MEAN:-

Arithmetic mean is the most popular and widely used measure for representing the entire data by one value and which is also known as average. Adding all the items together and then dividing this total by member of items added , the value is determined. Mean is used to find out the expected rate of common stock.

It is denoted by

$$E(R_J) = \frac{R_1 + R_2 + R_3 + \cdots \dots \dots R_n}{n}$$

$$E(R_j) = \frac{\sum R_j}{N}$$

Where,

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

R = Return on stock

\sum = sign of summation

B. RETURN ON RISK:-

It is the percentage increase on NEPSE index . market return is the average return of market as whole. It is calculated as

$$E(R_j) = \frac{R_1 + R_2 + R_3 + \dots \dots \dots R_n}{n}$$

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

Where ,

$E(R_j)$ = Expected rate of return of j statement

R = Return on stock

n = NO of years that return is taken

\sum = Sign of summation

B. RETURN ON MARKET:-

It is the percentage increase in NEPSE index. Market return is the average return of market as whole. It is calculated as

$$R_m = \frac{NI_t - NI_{t-1}}{NI_{t-1}}$$

Where,

R_m = Return on market

NI_t = NEPSE index at 't' time

NI_{t-1} = NEPSE index at 't-1' time

C.EXPECTED RETURN ON MARKET (ER_m):-

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

$$E(R_m) = \frac{\sum R_m}{n}$$

Where,

$E(R_m)$ = Expected return o market

$\sum R_m$ = Summation of market return

n = number of sample period

D. STANDARD DEVIATION:-

Standard deviation is the absolute of dispersion absolute measure of dispersion means that dispersion or variation of items around their expected value i.e arithmetic mean. Standard deviation is also regarded as root mean of the mean of the squared deviation from the arithmetic mean. The standard deviation is derived so that high S.D(σ) represents a large dispersion of return and high risk and vice versa.

Symbolically,

$$\sigma_j = \frac{\sqrt{\sum [R_j - E(R_j)]^2}}{n - 1}$$

Where,

σ_j = Standard deviation of stock

R_j = Single period rate of return on stock j

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

n = No. of years that the return are taken

if probability is given

$$\sigma_j = \sum_{t=1}^n [R_j - E(R_j)]^2 p_j$$

Where,

p_j = probability distribution of observation

E. COEFFICIENT OF VARIATION(C.V):-

Coefficient of variation in the relative measure of dispersion. Relative measure of dispersion is the ratio of measure of absolute dispersion to an appropriate average. It measures the risk per unit of return. It provides more meaningful basis for comparison when the expected return on two alternatives are same. The higher the coefficient of variation, the higher the risk and vice versa.

Symbolically it can be written as

$$C.V = \frac{\sigma_j}{\Sigma(R_j)}$$

Where,

C.V = Coefficient of variation of stock j

σ_j = Standard deviation of return as stock j

$\Sigma(R_j)$ = Expected rate of return j

The series for which the coefficient of variation is greater is said to be more variable or more risky, less consistent, less uniform or less homogeneous and vice versa.

F.BETA COEFFICIENT:-

Beta coefficient is an index that measures the systematic (undiversifiable) risk of any stock. More specifically speaking, beta coefficient of any security tells, how sensitive in that securities return with respect to the return in the market. Beta coefficient of particular stock will be less that equal or more than. But beta coefficient of market will be always one if beta of stock is less than one, then the stock is defensive and if the beta coefficient of stock is more than 1, then stock is aggressive.

Mathematically, beta coefficient of any security j is

$$\beta_j = \frac{\text{cov}(R_j R_m)}{\sigma^2_m}$$

$$\text{or, } \beta_j = \frac{\text{cov}(R_j R_m)}{\text{var}(R_m)}$$

Where,

β_j = Beta coefficient of stock j

$\text{cov}(R_j R_m)$ = Covariance of return security 'j' and the market portfolio

G. PORTFOLIO RETURN:-

The return gained from the investment in two or more than two assets or investment is known as portfolio return. The expected return on portfolio may be defined as weighted average of expected return and the assets which comprise the portfolio. The weight reflects the proportion of the portfolio or wealth invested in each asset.

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

Where,

$E(R_p)$ = Expected return on portfolio

W_i = Weight or proportion of fund invested in the security 'i'

W_j = Weight or proportion of fund invested in the security 'j'

$E(R_i)$ = Expected return 'i' assets

$E(R_j)$ = Expected return 'j' assets

H. TREND ANALYSIS:-

Observing the past behavior of return over a period of time, the analysis of risk and return can be done. Trend analysis depicts the trends in the operation of bank, the trend analysis indicates that the direction of change that help in studying the bank position and change there. Over time and determine whether there has been an improvement or deterioration in the financial condition and performance over time.

There are various methods that can be used for determining trend such as trend percentage, method of least square, graphical method and like that. However, the method used in this study is method of least squares and to make the study simple and easy to understand graphical method is also used.

H (A). METHOD OF LEAST SQUARES:-

The method of least squares is widely used. In practice with the help of this method, a trend line is fitted to the data in such a manner that the following two conditions are fulfilled:-

1. $\sum(Y-Y_n)=0$

Where,

Y = Actual dependent variable value

Y_n = Computer value for different n periods

N = 1,2,3,.....n

2. $\sum(Y-Y_n)^2$ = are least i.e sum of the deviation of the actual computed value is least from this line and hence the name is given the method of least square.

The method of least square may be use either to fit a straight line trend or parabolic trend. The straight line trend is represented by the equation

$$Y_n = a + bx$$

Where,

Y_n =is used to designate the trend value to distinguish from the Y values

a = is the Y intercept

b = is the slope of the trend line

x = is the independent variable that represents time taking mid point as origin

Symbolically,

$$a = \frac{\sum Y}{N}$$

$$b = \frac{\sum XY}{\sum X^2}$$

Where,

$\sum Y$ = Sum of the values of dependent variable

N = No of observation

$\sum XY$ = Sum of the variable X and Y multiplied

$\sum X^2$ = Sum of the squares values of variable

The constant “a” is equal to mean of y value and the constant “b” give the rate of change

H(B).GRAPHICAL METHOD:-

Graphical method is used in the study to share the calculated or predicted values for different five years derived from the trend equation. The graphical method used in the study is presented with a view of supporting the tabulated values of trend equation and trend values of selected commercial banks. On the X- axis of the graph Fiscal year are presented and on Y-axis the Banks with the predicted values are shown.

I. ANALYSIS OF VARIANCE:-

Analysis of variance or ANOVA is statistical technique developed by R.A Fisher designed specially to test whether the mean value of more than two quantitative population are equal. It tests the null hypothesis that two or more sample come from population with equal means and are different only to sampling errors.

The F. test mechanism is used to analysis of variance. This technique is used in present study to test the null hypothesis that mean value of various parameters of five years 2002/03 to 2008/09 of selected banks are equal and come from the same sample or similar population.

The ANOVA Test can be completed by applying the following steps:-

Step1 - Formulate the null and alterative hypothesis

Step2 - Complete variance between the samples using the following procedure:-

1. Complete the mean of each sample i.e X

2. Complete the deviation, the sample mean from the grand means and square these deviations and multiply by the sample size . this will give sum of squares in column(SSR)
3. Complete the mean squares between the samples(MSR)

$$MSR = \frac{SSR}{K - 1}$$

Where ,

K= No of samples

k-1 = Degrees of freedom

Step3- Compute variance within the sample using following steps:-

1. Compute the mean value of each sample.
2. Sum of the squares of deviation values sample items from their mean.
3. Repeat (2) for all sample and contain the total of sum squares of deviation of various sample from their respective means (SSR)
4. Calculate the mean square within the sample(MSR)

$$MSR = \frac{SSR}{N - K}$$

5. Calculate the total sum of squares of various

$$SST = SSR + SSE$$

Step4- Prepare the ANOVA table

ANOVA TABLE

Source of variation	SS	dF	MS	F-Ratio	Result
Explained variance	SSR	K-1	MSR = SSR/K-1	$\frac{SSR}{SSE}$	
Unexplained variance	SSE	N-k	MSE = SSE/N-K		
Total	SST	N-1			

Where,

SS = sum of squares

dF = Degree of freedom

MS = Mean square

$$F - \text{ratio} = \frac{\text{Explained Variance(SSR)}}{\text{Unexplained Variance(SSE)}}$$

Step5- Make decision:-

If the compute value of F is less than the critical value say at 5% Level of significance H_0 is accepted otherwise, H_1 accepted.

J.KARL PEARSON'S SOEFFICIENT OF CO-RELATION

Co-relation is an analysis of co-variation between two or more variables. If two or more quantities vary in such a way that movements in the other accompany movement is one these quantities are said to be co-related. It is statistical device that helps to analyze the co-movement between two or more variables. The co-relation co-efficient however only helps to determine the extent to which to variables are co-related but doesn't tell us about the cause and effect of relationship. Even there is high degree of co-relation between two variables one cannot say with certainly which one is the cause and which one is the effects.

Co-relation may be positive or negative. If return on two securities one negatively co-relation which combine in portfolio reduce the risk. If securities are positively co-related, risk cannot be reduced.

The Pearson's coefficient of co-relation is mathematically expressed as:-

$$r = \frac{N \sum XY - \sum X . \sum Y}{\sqrt{N \sum X^2 - (\sum X)^2} * \sqrt{N \sum Y^2 - \sum(Y)^2}}$$

Where,

r = Karl Pearson's coefficient of co-relation

N = No of observations

$\sum X$ = Sum of the values of variable X

ΣY = Sum of the values of variable Y

ΣXY = Sum of the multiplies variable of X and Y

ΣX^2 = Sum of the squared values of variables X

ΣY^2 = Sum of the squared values of variables Y

The value of co-relation coefficient always lies between +1 to -1

K.REGRESSION ANALYSIS:-

The term 'regression' literally means 'stepping back towards the average'. The concept of regression was first given by the English Biometrician Sir Francis Galton (1822-1991). In reports of his research on heredity nowadays regress is used as a statistical tool which is used to determine the statistical relationship between two or more variable. It is simple a relationship between dependent variable and independent variable. This analysis helps to identity sensitivity of return on various the financial variable. In this model, we study the following two relationships:-

- *Simple regression model*
- *Multiple regression model*

A. SIMPLE REGRESSION MODEL:-

In this model, one document variable and one independent variable is used to measure the regression. If Y is the linear function of X, Y on X can be express as :

$$Y = a + bx$$

Where,

Y = Dependent variable

X = Independent variable

a,b = Regression parameters

B.MULTIPLE REGRESSION MODEL:-

Multiple regression equation describes the average relationship between one dependent and two or more variables and this relationship is used to predict or control the dependent variable.

The multiple regression equation of dependent variables Y on X independent variables $X_1, X_2, X_3, X_4, \dots, X_n$ can generally be expressed as :-

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + \dots + b_nX_n$$

To test the significance of model as well as its validity following test should be done.

1> Coefficient of determination

2> F-statics

3.5.2 FINANCIAL TOOLS:-

Financial tools are applied to find out rate of return

1.MARKET PRICE OF STOCK :-

If the market prices of share of companies are followed then it can be found that there are three types of prices, high, low and closing. For the analysis single one is needed. So, average price(that of high and low) or closing approaches can be used. Here in the study, closing price is taken as market price of stock which has specific time of span of one year and the study has focused in annual basis. To get the average volume and price of each transaction in the whole year are essential, which is tedious and impossible to consider the data availability and maintenance. Hence, the closing price is used as the market price of stock.

2.1.DIVIDEND PER SHARE (DPS):-

Dividend is relevant during the computation of rate of return, which is a reward to share's for their investment. If a company declares only the cash dividend there is no problem to take the dividend amount. But the company declares stock dividend (bonus share). It is difficult to obtain the amount that really shareholder's has gained. In this case they get extra number of share as dividend and simultaneously price of stock declines as result of increased number of stock. To get the real amount of dividend following model has been used.

Total dividend amount = cash dividend + % of stock dividend / X
next year MPS

Sometime the company issued right issued at par. In this situation we can calculate total dividend amount by this model.

Total dividend = cash dividend + right share% × (next year MPS-price of right share)

2.2.EARNING PER SHARE(EPS):-

Earning per share is the earning which is a share earning during the Financial year. EPS is a whole amount which the investable amount have to get during the Financial i.e, a investor invests Rs.10,000 dividing 10 share, which have Rs100 per value in the whole Financial Rs.100ear Rs.5 then the Rs.5 is earning per share(EPS). It is also a tool's which have give us return before dividend and tax. So, we can say that EPS and EBIT is same.

CHAPTER – FOUR **PRESENTATION AND ANALYSIS OF DATA**

This chapter is main body of the study. In this chapter the effort has been made to analyze risk and return on common stock investment which includes detail data of market price of share earning per share and dividend of each selected listed commercial banks, their interpretation and analysis with reference to the various reading and literature review in the preceding chapter effort is made to analyze the recent Nepalese stock market movement to the listed commercial banks.

In this chapter the data presented in tabulation and graphical form to analyze and interpret systematically. The data are diagnosed, selected, formatted and calculated before giving the tabular and graphical form. They are analyzed and interpreted. The data applied for the study are of six fiscal years (2003/04 to 2008/09) in order to assess the risk and return of common stock investment in commercial banks.

For the purpose the data are analyzed and interpreted in two ways: descriptively and inferentially. Descriptive analysis is carried out to determine the risk and return position of selected commercial banks using different statistical tools viz. Arithmetic mean, standard deviation and coefficient of variation, Karl's Pearson's coefficient of correlation. The time series analysis (Trend analysis) is devoted to examine the Trend and trend equation of return of each institution under study.

The inferential analysis is applied to make Inter-bank analysis on risk and return position based on analysis of variance (ANOVA) including regression analysis based on expected return as dependent variable and beta and correlation coefficient with the market as independent.

4.1 ANALYSIS OF INDIVIDUAL COMMERCIAL BANK:-

As the study has taken a special reference to listed commercial banks among 29 commercial banks operating in Nepal, only 21 commercial banks are listed in NEPSE. Among them the study has taken 5 samples of commercial

bank as NEPAL ARAB BANK (NABIL), STANDARD CHARTED BANK NEPAL LTD (SCBNL), HIMALAYAN BANK LTD (HBL), EVEREST BANK LTD (EBL), BANK OF KATHMANDU LTD (BOK).

4.1.1 NEPAL ARAB BANK LTD (NABIL):-

Nepal Arab Bank Ltd. Is the First joint-venture Commercial bank in Nepal which is Joint-venture of Nepalese promoters and Emirates Bank International (DUBAI) and established in 1984 A.D(2041 B.S). Now it's 30percent equity hold by Nepalese promoters, 50 percent hold by Emirates bank International and remaining 20percent have issued general public of Nepal. The Bank listed in NEPSE in 1986 A.D NABIL provide a full range of commercial banking service through its 19 points of representation across the nation and over 170 reputed correspondent bank across the globe. The bank as a pioneer introducing many innovative products and marketing concept in the domestic banking sector represent a mile stone in banking history of Nepal as it started an era of modern banking with customers satisfaction measured as focal objective while doing business it is fully equipped with modern technology which includes ATMs, Credit card, Debit card, state of art world renewed software from Infosys Technologies system, Bangalore India, internet banking system and Tele banking system. The authorized capital, issued capital and paid up capital of NABIL are Rs.1600 million, Rs.965.75 million and Rs.965.75 million respectively with per value of Rs.100 and total number of equity outstanding 9657500as end of Fy2008/09.

4.1.1.1:- Following table No.4.1 represent the market price of share (MPS). Earning per share(EPS) and dividend per share(DPS) of NABIL for the purpose of risk and return analysis.

MPS, EPS AND DPS DATA OF NABIL

TABLE NO 4.1

Fiscal Year	Market Price Per Share(MPS)	Earning Per Share(EPS)	Dividend Per Share(DPS)		
			Cash	Stock Dividend	Total
2003/04	1000	92.61	65	-	65
2004/05	1505	105.79	70	-	70
2005/06	2240	129.21	85	-	85
2006/07	5050	137.28	140	-	140
2007/08	5275	108.91	100	-	100
2008/09	4899	106.76	85	-	85

4.1.1.2:- Calculation of rate of return, expected return, standard deviation and coefficient of variation of common stock of device.

Rate of return for each year is calculated on the basis of closing price of common stock and dividend amount of respective year. In this study closing price and dividend amount are taken for the purpose of calculation of rate of return because closing price is actual price which is show the trade value of share and amount of dividend is the amount which is actual amount have to receive by share holder. Table no 4.2 shows the calculation of year wise rate of return expected rate of return, standard deviation and coefficient of variation.

TABLE NO 4.2
Calculation of E(R), S.D., C.V.

Fiscal Year	Closing price(P)	Dividend(D)	R_t $= \frac{P_t - P_{t-1} + D_t}{P_{t-1}}$	[R-E(R)]	[R-E(R)]²
2003/04	1000	65	-	-	-
2004/05	1505	70	0.575	0.0852	0.0072
2005/06	2240	85	0.545	0.0552	0.0030
2006/07	5275	140	1.32	0.8302	0.6892
2007/08	5275	100	0.064	-0.4258	0.1813
2008/09	4899	85	-0.055	-0.10398	0.0108
Total			2.449		0.8915

Source:- Appendix I(A)

We have,

$$\text{Expected Return}(R) = \frac{\sum R}{N} = 2.449/5 = 0.4898$$

$$\begin{aligned} \text{Standard Deviation}(\sigma) &= \frac{\sqrt{\sum [R - E(R)]^2}}{n - 1} \\ &= \frac{\sqrt{0.8915}}{5-1} \\ &= \sqrt{0.222875} \\ &= 0.47212 \text{ or } 47.2\% \end{aligned}$$

Coefficient of variation(C.V) = $\sigma/E(R)$

$$\begin{aligned} &= \frac{0.4721}{0.4898} \\ &= 96.38 \end{aligned}$$

4.1.1.3:- Trend value for each year are calculated on the base of rate of return on common stock of NABIL respective year by using least square method as following. Table No4.3 shows the calculation of trend value of common stock of NABIL.

TABLE NO 4.3
Calculation of Trend Value

Fiscal Year	Rate of return(Y)	Deviation from Fy 2006/07	XY	X²	Trend value(Y_e)
2004/05	0.575	-2	-1.15	4	0.8258
2005/06	0.545	-1	-0.545	1	0.6593
2006/07	1.32	0	0	0	0.4898
2007/08	0.064	1	0.064	1	0.3203
2008/09	-0.055	2	-0.11	4	0.1508
Total	ΣY=2.449	ΣX=0	ΣXY=1.695	ΣX²=10	

Source : Table No 4.2

We have,

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

Where, $\Sigma X = 0$

$$a = \frac{\Sigma Y}{n} = \frac{2.449}{5} = 0.4898$$

$$b = \frac{\Sigma XY}{\Sigma X^2} = \frac{-1.695}{10} = -0.1695$$

Trend line

$$Y_e = a + bx$$

$$Y_c = 0.4898 + (-0.1695)x$$

when $x = (-2)$, $Y_c = 0.4898 + (-0.1695) \times (-2) = 0.8288$

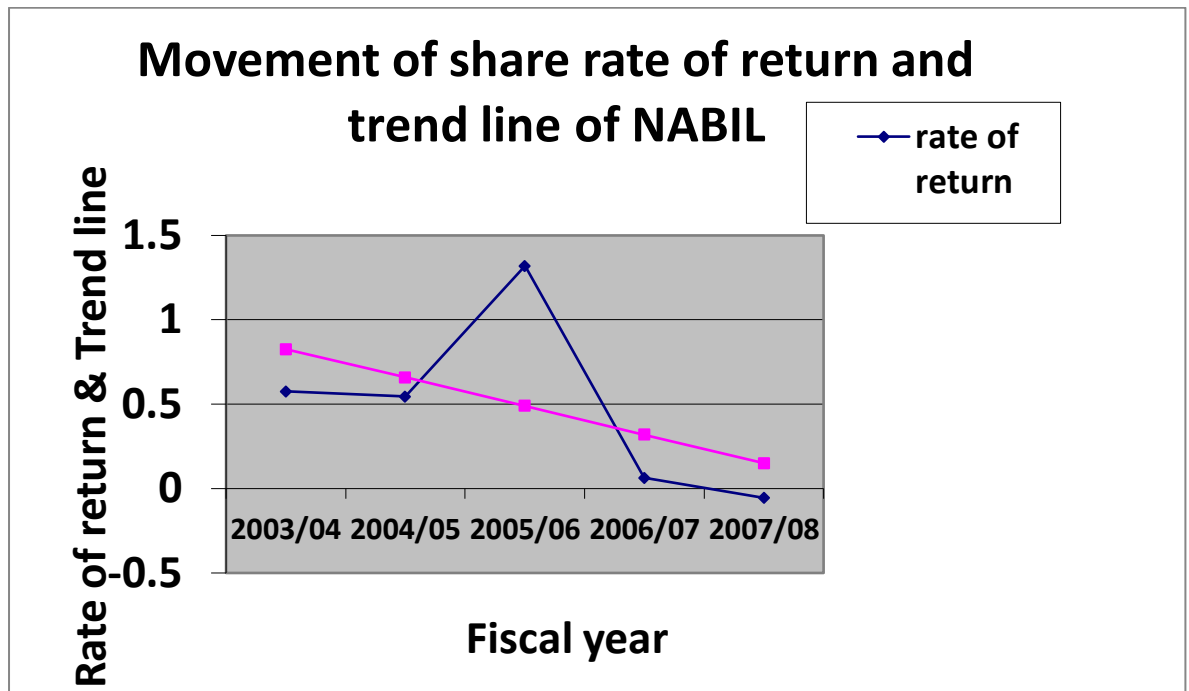
when $x = (-1)$, $Y_c = 0.4898 + (-0.1695) \times (-1) = 0.6593$

when $x = (0)$, $Y_c = 0.4898 + (-0.1695) \times (0) = 0.4898$

when $x = (1)$, $Y_c = 0.4898 + (-0.1695) \times (1) = 0.3203$

when $x = (2)$, $Y_c = 0.4898 + (-0.1695) \times (2) = 0.1508$

DIAGRAM NO 4.1



Source :- Table No 4.3

The above diagram shows that movement of stock's of NABIL bank rate of return and Trend line value. In the beginning rate of return is very high and positive return in Fy2009/04. The rate of return is more than 100% in the year Fy2005/06. Then fall in down and goes negative sine. Trend line also show the diminiing result in following Fy.

4.1.2:-HIMALAYAN BANK LTD(HBL):-

Himalayan Bank Ltd. is a joint venture commercial bank with Habib Bank of Pakistan which was established in 1992. This is the first joint venture bank managed by Nepalese Chief Executive. The main objective of the bank is to provide modern banking facilities like telebanking to business to business man Industrialists and other profession and to provide loans for Agriculture and Industrial sector. Now its 20% share is hold by Habib Bank of Pakistan and rest 80% share is hold by Nepalese promoters. Financial institutions, organized institution general public and others. Its authorized capital isRs.2000 million and Rs.1216.22 million is issued capital and rs,1216.33 million is paid up

capital at the end of Fy 2008/09. The share of Himalayan Bank Ltd. Was listed in Nepal stock exchange ltd. On 2050-03-21 B.S

4.1.2.1:- The following table shows the market price per share, Earning per share and dividend per share of HBL.

**MPS, EPS AND DPS DATA OF HIMALAYAN
TABLE NO. 4.4**

Financial year	Market price per share(MPS)	Earning price per share(EPS)	Dividend per share(DPS)		
			Cash	Stock	Total
2003/04	840	49.05	-	20%	184
2004/05	920	47.91	31.58	20%	251.58
2005/06	1100	59.24	35	20%	383
2006/07	1740	60.66	40	20%	436
2007/08	1980	62.74	45	10%	221
2008/09	1760	61.90	43.56	15%	267.8

Working note:-

Total dividend = cash + % of stock dividend * next year MPS

= Rs.0+20% of 920 = Rs.184

= Rs.31.58+20% of 1100=Rs.251.58

= Rs.35+20% of 1740= Rs.383

= Rs.40+20% of 1980=Rs.436

= Rs.45+10% of 1760=Rs.221

= Rs.43.56+15% of 1760=Rs.267.8

The above table shows the HBL's EPS, DPS and MPS. Market price per share (MPS) is the highest in the Fy 2007/2008 i.e Rs.1980 and lowest in the Fy2003/04 which is the beginning year of data in this study. HBL has the earning price per share in the Fy 2007/08 and lowest in the Fy 2003/04. DPS is highest or total dividend is highest in the Fy 2006/07(i.e Rs.436)due to regular bonus share and lowest at the Fy 2003/04 paid only bonus share.

4.1.2.2:- Calculation of rate of return expected return standard deviation and coefficient of variation of common stock and dividend amount of respective year. Table No.4.5 show the calculation of expected rate of return standard deviation and coefficient of variation.

TABLE NO.4.5
Calculation of E(R), S.D. and C.V

Fiscal year	Closing Price(P)	Dividend(D)	$R = \frac{P_t - P_{t+1} + P_t}{P_t}$	[R- (ER)]	[R- E(R)] ²
2003/04	840	184	-	-	-
2004/05	920	251.58	0.3947	-0.0601	0.0036
2005/06	1100	383	0.6119	0.1571	0.0247
2006/07	1740	436	0.9782	0.5234	0.2739
2007/08	1980	221	0.2649	-0.1899	0.0361
2008/09	1760	267.8	0.0241	-0.4307	0.8155
Total			2.2738		0.5238

Source:-Appendix –II(A)

We have,

$$\begin{aligned} \text{Expected rate of return } E(R) &= \frac{\sum R}{N} = \frac{2.2798}{5} \\ &= 0.4548 \end{aligned}$$

$$\begin{aligned} \text{Standard deviation } (\sigma) &= \sqrt{\frac{\sum [R - E(R)]^2}{n - 1}} \\ &= \sqrt{\frac{0.5238}{5 - 1}} = \sqrt{0.1309} \\ &= 0.3169 \end{aligned}$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{E} = \frac{0.3619}{0.4548}$$

$$= 0.7957 \text{ or } 79.57\%$$

4.1.2.3:- Trend value for each are calculated on the basis of rate of return on common stock of HBL respective year by using least square method as follows.

Table No. 4.6 the calculation of trend value of common stock of HBL.

TABLE NO.4.6
Calculation of Trend Value

Fiscal year	Rate of return(Y)	Deviation from Fy 2006/07(X)	XY	X²	Trend value(Y_c)
2004/05	0.3947	-2	-0.7894	4	0.6724
2005/06	0.6119	-1	-0.6119	1	0.5636
2006/07	0.9782	0	0	0	0.4548
2007/08	0.2649	1	0.2649	1	0.3460
2008/09	0.0241	2	0.0482	4	0.2372
Total	ΣY=2.2738	ΣX=0	ΣXY=-1.0882	ΣX²=10	

Source: Table No.4.5

We have,

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

$$\Sigma X=0, a = \Sigma Y/n = 2.2738/5 = 0.4548$$

$$b = \Sigma XY/X^2 = -1.0882/10 = -0.1088$$

Now,

Trend line equation $Y_c = a + bx$

$$Y_c = 0.4548 + (-0.1088) X$$

$$\text{When } X=-2, Y_c = 0.4548 + (-0.1088) \times (-2) = 0.6724$$

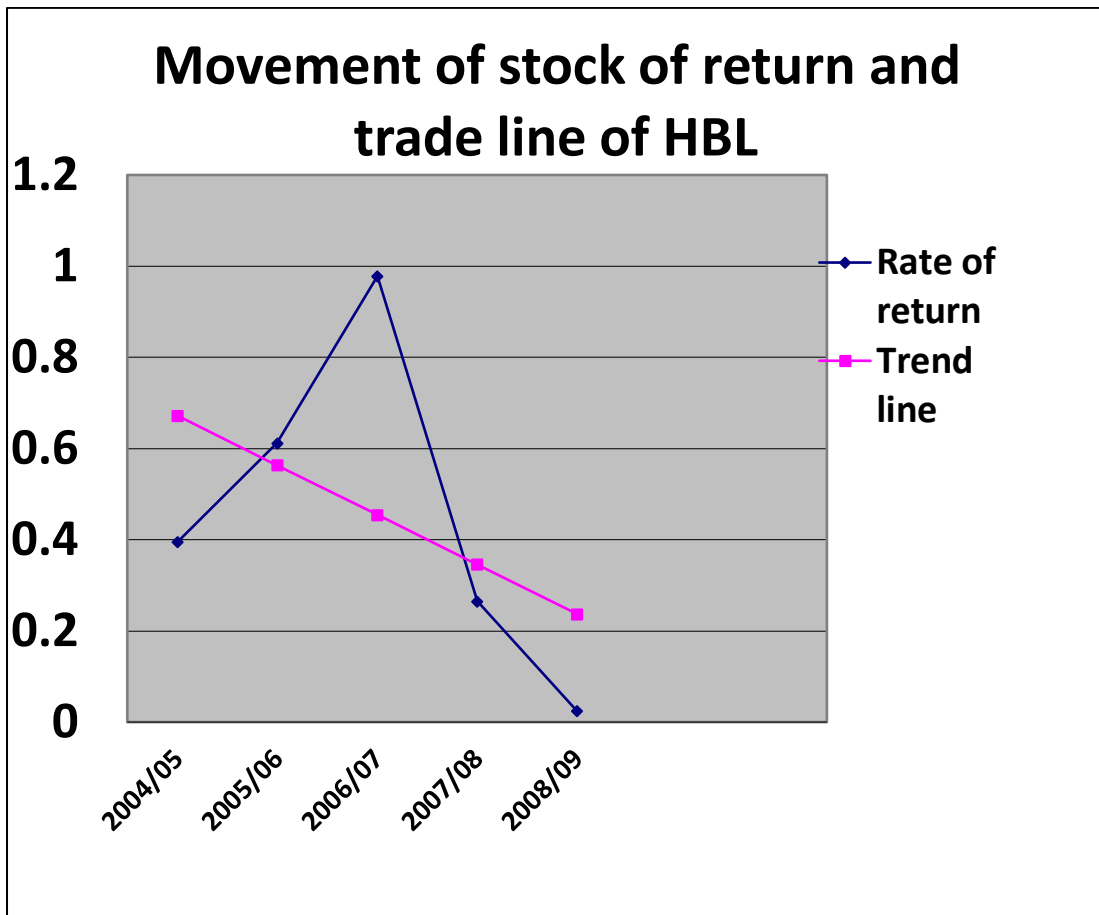
$$\text{When } X=-1, Y_c = 0.4548 + (-0.1088) \times (-1) = 0.5636$$

$$\text{When } X=0, Y_c = 0.4548 + (-0.1088) \times (0) = 0.4548$$

$$\text{When } X=1, Y_c = 0.4548 + (-0.1088) \times (1) = 0.3460$$

$$\text{When } X=2, Y_c = 0.4548 + (-0.1088) \times (2) = 0.2372$$

DIAGRAM NO 4.2



Source:-Table No.4.6

Above diagram shows that the movement of stock's rate of return and trend line of HBL in the Beginning rate of return positive and normal return in F_y year 2004/05. In the F_y year 2006/07 rate of return is very high. Then rate of return goes downward from and goes minimum in F_y 2008/09. Similarly trend value of HBL has goes downward follow in the sequent Year

4.1.3:-STANDARD CHARTERED BANK LTD.:-

Standard Chartered Bank Ltd. was formerly named as Girindley's Bank established in 1985 as Foreign Joint Venture Bank under the company at 1964 in 2000.

Nepal Girindlen bank was amalgated in Standard Chartered Banking group and then 50% share was transferred to it by the virtue of amalgation 33.34% of equity share capital helped by general public investors and remaining share capital are provided Girindley Bank. The bank has been providing various services to its customer through national wide branches. The bank is listed in NEPSE at 2045 B.S. the bank has authorized issued and paid up capital of Rs.1000 million , Rs.913.97 million and Rs.931.37 million respectively with 9313700 number of share outstanding each Rs.100 at the end of F2008/09.

4.1.3.1:- Following table No.4.7 shows market price per share(MPS), earning price per share (EPS) and dividend per share (DPS) of SCBNL in the purpose of risk and return analysis.

MPS, EPS AND DPS DATA OF SCBNL
TABLE NO.4.7

Fiscal year	Market price per share(MPS)	Earning price per share(EPS)	Dividend per share		
			Cash	Stock Dividend	Total
2003/04	1745	143.55	110	-	110
2004/05	2345	143.14	120	-	120
2005/06	3775	175.84	120	-	120
2006/07	5900	167.37	80	-	80
2007/08	6830	131.92	80	-	80
2008/09	7750	110.33	-	-	-

The above table shows the MPS, DPS, EPS of SCBNL according to the table MPS is high at Fy2008/09 and low at Fy2003/04. EPS is high at Fy2005/06 and low at the Fy2008/09. Dividend payment is regular and high at Fy2005/06 and low at Fy2008/09 because there is no dividend due to unaudited data for the same year. MPS data show the average data Rs.145.36 but EPS is high in Fy2005/06 and lowest at Fy2008/09.

4.1.3.2:- Calculation of rate of return, expected return, standard deviation and coefficient of variation of common stock SCBNL.

Rate of return each year calculated on the basis of closing price of common stock and dividend amount of respective year. Table No.4.8 shows the calculation of year wise rate of return, expected rate of return, standard deviation and coefficient of variation.

TABLE NO.4.8
Calculation of E(R), S.D. and C.V.

Fiscal year	Closing price of MPS (P)	Dividend per share(DPS)	$R = \frac{P_t - P_{t-1} + P_{t1}}{P_{t-1}}$	[R-E(R)]	[R-E(R)] ²
2003/04	1745	40	-	-	-
2004/05	2345	120	0.4126	0.0187	0.0003
2005/06	3775	120	0.6670	0.2731	0.0746
2006/07	5900	80	0.5841	0.1902	0.0362
2007/08	6830	80	0.1712	-0.2227	0.0496
2008/09	7750	-	0.1347	-0.2592	0.0672
Total			ΣR=1.9696		0.2279

Source:-Appendix III(A)

We have,

$$\begin{aligned} \text{Expected rate of return } E(R) &= \frac{\Sigma(R)}{n} = \frac{1.9696}{5} \\ &= 0.3939 \end{aligned}$$

$$\begin{aligned} \text{Standard deviation } (\sigma) &= \sqrt{\frac{\Sigma[R - E(R)]^2}{n - 1}} = \sqrt{\frac{0.2279}{5 - 1}} = \sqrt{0.056975} \\ &= 0.2387 \text{ or } 23.87\% \end{aligned}$$

$$\begin{aligned} \text{Coefficient of variation (CV)} &= \frac{\sigma}{ER} = \frac{0.2387}{0.3939} \\ &= 0.6060 \text{ or } 60.60\% \end{aligned}$$

4.1.3.3:-Trend value for each year are calculated on the basis rate of return on common stock of SCBNL respective year by using least square method as

follows Table No.4.9 shown the calculation of trend value of common stock of SCBNL.

TABLE NO.4.9
Calculation of Trend value

Fiscal year	Rate of return(Y)	Deviation from F_y25006/07(X)	XY	X²	Trend value(YC)
2004/05	0.4126	-2	-0.8252	4	0.5699
2005/06	0.6670	-1	-0.6670	1	0.4819
2006/07	0.5841	0	0	0	0.3939
2007/08	0.1712	2	0.3424	1	0.3059
2008/09	0.1347	1	0.2694	4	0.2179
Total	1.9696		-0.8804	10	

Source:- Table No.4.8

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

$$\sum X = 0 \quad a = \frac{\sum Y}{n} = \frac{1.9696}{5} = 0.3939$$

$$b = \frac{\sum XY}{\sum X^2} = \frac{-0.8804}{10} = -0.088$$

Now,

Trend line equation $Y_c = a + bx$

$$Y_c = 0.3939 + (-0.088)X$$

$$\text{When } X=-2, Y_c = 0.3939 + (-0.088) \times (-2) = 0.5699$$

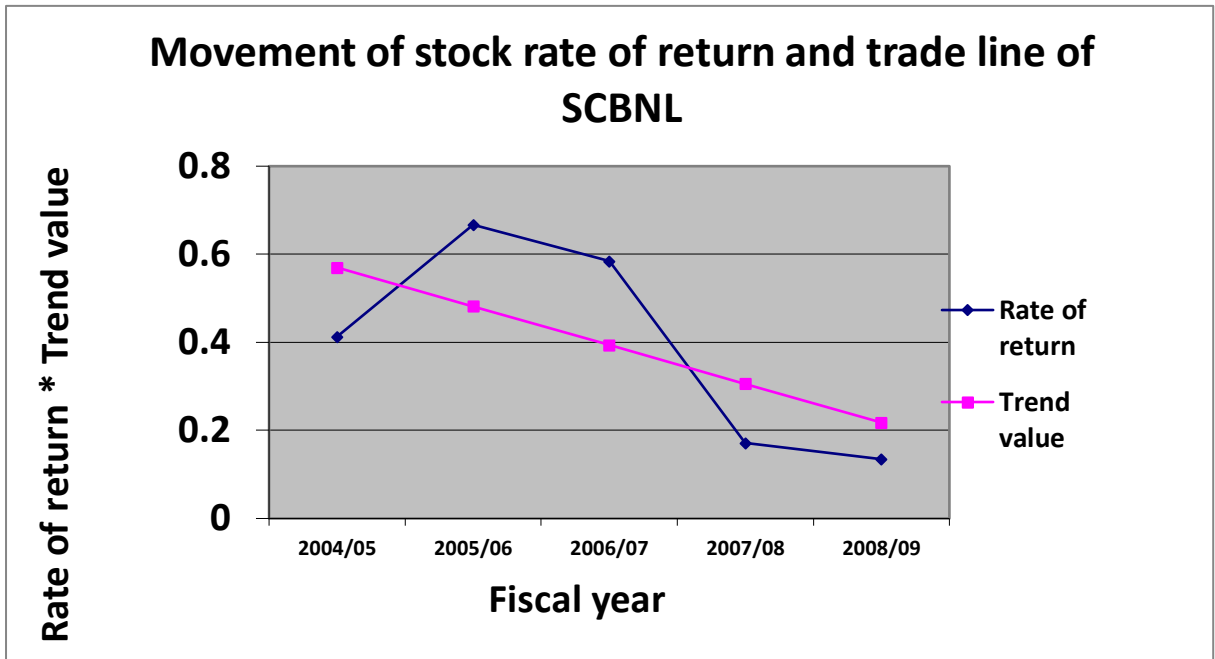
$$\text{When } X=-1, Y_c = 0.3939 + (-0.088) \times (-1) = 0.4819$$

$$\text{When } X=0, Y_c = 0.3939 + (-0.088) \times (0) = 0.3939$$

$$\text{When } X=1, Y_c = 0.3939 + (-0.088) \times (1) = 0.3059$$

$$\text{When } X=2, Y_c = 0.3939 + (-0.088) \times (2) = 0.2179$$

DIAGRAM NO 4.3



Above diagram shows that movement of stocks of SCBNL Bank rate of return and Trend line. In the beginning trend value is high in F_y2004/05, then gradually moves downward and is low in F_y2008/09. Similarly rate of return is normal at F_y2004/05 and then goes upward then rate of return moves downward way and goes low point is F_y2008/09 but till positive value of rate of return.

4.1.4:-EVEREST BANK LTD (EBL):-

Everest Bank Ltd. was established in 1994 A.D (2051B.S) under the company act 1964 A.D with an objective of carrying out commercial banking activities under the commercial bank act 1974 united bank of India Ltd. under the technical service agreement signed between it and Nepalese promoter. Nepalese promoter was managing the bank till November 1996. Later on it hold over the management of Punjab National Bank Ltd. India which hold 20% equity share, 50% equity share 30% equity share hold by general public investor. The authorized, issued and paid of capital of EBL is Rs.1000 million, Rs.840.62 million and Rs838.82 million respectively.

4.1.4.1:- The following table shows the market price per share (MPS), earning price share (EPS) and Dividend per share (DPS) of EBL for the purpose of risk and return analysis.

MPS, EPS AND DPS DATA OF EBL
TABLE NO.4.10

Fiscal year	Market price per share(MPS)	Earning per share(EPS)	Dividend per share(DPS)		
			Cash	Stock Dividend	Total
2003/04	680	45.57	-	20%	174
2004/05	870	32.47	20	5%	88.95
2005/06	1379	45.81	25	5%	146.5
2006/07	2430	57.22	40	-	40
2007/08	3132	54.27	50	10%	295.5
2008/09	2455	76015	60	-	60

Source:-Appendix III(A) and Nepalese Index

Table No.4.10 shows the MPS, EPS and DPS of EBL for six years only. In the table MPS is high in the F_y2007/08 and lowers in F_y2003/04. EPS is highest in the F_y2007/08 and lowest in the F_y year 2004/05. In the comparing the EPS and MPS, MPS are increased year by year but EPS are not move to upward year by year. DPS of EBL show the actual amount received by EBL's shareholder according to EBL's policy. EBL also paid stock dividend. DPS is high in the F_y2007/08 and low in the F_y2006/07.

Total dividend = cash + stock dividend (%) * next year MPS

- # 20% of 870 = Rs.174
- ## 20 + 5% of 1379 = Rs.88.95
- ### 25 + 5% of 2430 = Rs.146.5
- #### 50 + 10% of 2455 = Rs.295.5

4.1.4.2:- Calculation of rate of return expected rate of return, standard deviation and coefficient of variation of common stock of EBL.

Rate of return for each year is calculated on the basis of closing price of common stock and dividend amount of respective year Table No.4.11 show the calculation of year wise rate of return, expected rate of return, standard deviation and coefficient of variation.

TABLE NO.4.11
Calculation of E(R), S.D. and C.V

Fiscal year	Closing price(P)	Dividend (D)	$R_t = \frac{(P_t - P_{t-1}) + D_t}{P_{t-1}}$	[R-E(R)]	[R-E(R)]²
2003/04	680	174	-	-	-
2004/05	870	88.95	0.41	0.05	0.0025
2005/06	1379	146.5	0.75	0.39	0.1521
2006/07	2430	40	0.79	0.43	0.1849
2007/08	3132	295.5	0.41	0.05	0.0025
2008/09	2455	60	-0.20	-0.56	0.0136
Total			2.16		0.6556

Source = Appendix IV (A) and NEPSE Index

We have,

$$\text{Expected rate of return } E(R) = \frac{\sum R}{n} = \frac{2.16}{5} = 0.36$$

$$\begin{aligned} \text{Standard deviation } (\sigma) &= \frac{\sqrt{[R - E(R)]^2}}{n - 1} \\ &= \frac{\sqrt{0.6556}}{5 - 1} = 0.4048 \end{aligned}$$

$$\begin{aligned} \text{Covariance coefficient (C.V)} &= \frac{\sigma}{E(R)} \\ &= \frac{0.4048}{0.36} = 1.124 \end{aligned}$$

4.1.4.3:-Trend value for each year is calculated on the basis rate of return of common stock of EBL respective year by using least square method as follows. Table No.4.12 shows the calculation of trend value of common stock of EBL.

TABLE NO.4.12

Calculation of Trend value

Fiscal year	Rate of return(Y)	Deviation from F_y 2006/07 (X)	XY	X²	Trend value (Y_C)
2004/05	0.41	-2	-0.82	4	0.672
2005/06	0.75	-1	0.75	1	0.516
2006/07	0.79	0	0	0	0.36
2007/08	0.41	1	0.41	1	0.204
2008/09	-0.20	2	-0.40	2	0.048
Total	2.16		-1.56	10	

Source: Table No.4.11

We have,

Equation of trend line be, $Y_c = a + bx$

Where,

$$\sum X = 0 \quad a = \frac{\sum Y}{n} = \frac{2.16}{5} = 0.36$$

$$b = \frac{\sum XY}{\sum X^2} = \frac{1.56}{10} = -0.156$$

Now, Trend line equation is $Y_c = a + bx$

$$Y_c = 0.36 + (-0.156)$$

$$\text{When } X = (-2), Y_c = 0.36 + (-0.156) \times (-2) = 0.672$$

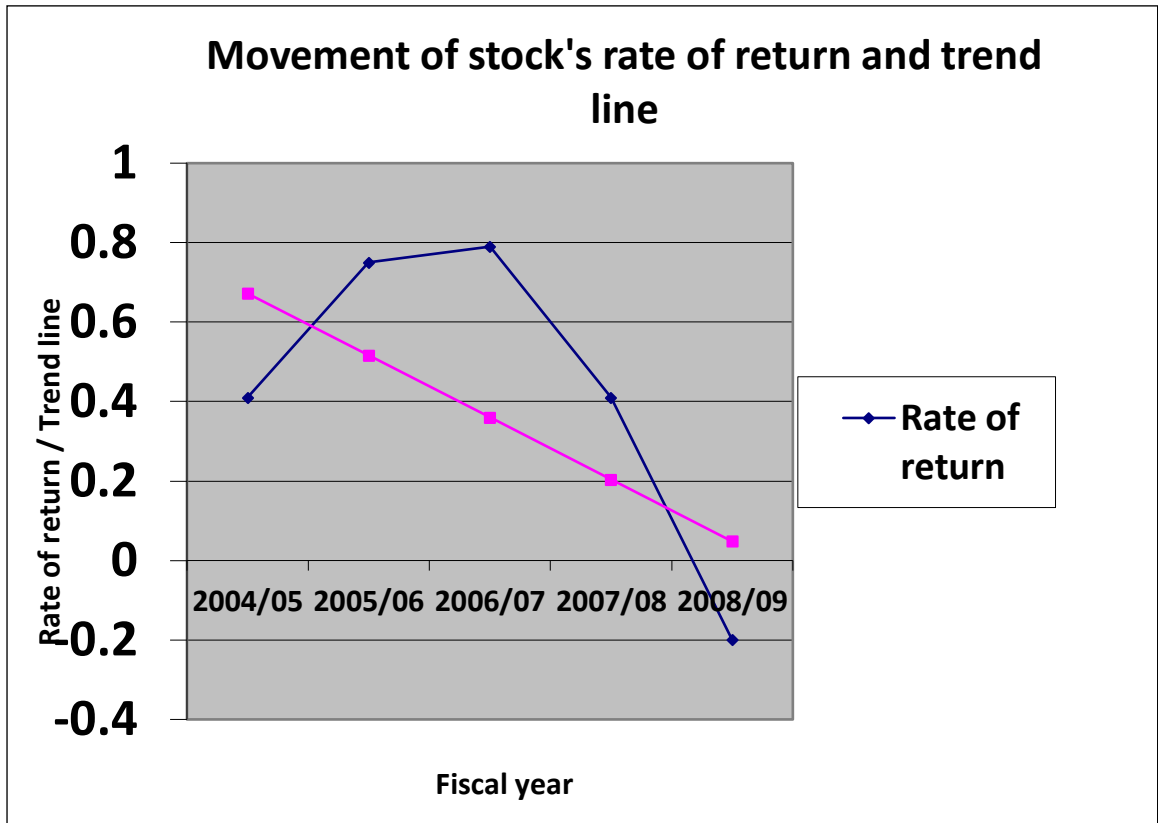
$$\text{When } X = (-1), Y_c = 0.36 + (-0.156) \times (-1) = 0.516$$

$$\text{When } X = (0), Y_c = 0.36 + (-0.156) \times (0) = 0.36$$

$$\text{When } X = (1), Y_c = 0.36 + (-0.156) \times (1) = 0.204$$

$$\text{When } X = (2), Y_c = 0.36 + (-0.156) \times (2) = 0.048$$

DIAGRAM NO.4.4



Source :-Table No.4.12

Above diagram shows that movement of stock's rate of return and trend line of EBL. In the beginning rate of return is average and positive in Fy2006/07 rate of return is high and goes downward and costly have negative rate of return in Fy2008/09. Similarly trend line goes to downward and gets minimum trend value in Fy2008/09

4.1.5 BANK OF KATHMANDU (BOK):-

Bank of Kathmandu was established in 1994 A.D (2051 B.S) under the company act 1964 with objective of carrying out commercial banking activities under the commercial bank act 1974. Joint venture with bank of Thailand Ltd. which help the bank in technical as well as management to the Nepalese promoter BOK provide all the modern banking service to their customer and fulfill their need in the bank 40% share invest by Bank of Thailand 40% equity invest by Nepalese promoter and financial institution and 20% equity hold by general public the authorized ,issued and paid of capital of bank of Kathmandu

is 1000,illions 844.40 million and 844.40 million respectively at the end of 2008/09.

4.1.5.1:- The following table no 4.13 shows the MPS, EPS and DPS of BOK for purpose of risk and return analysis.

MPS, EPS AND DPS DATA OF BOK
TABLE NO. 4.13

Fiscal year	Market price per share(MPS)	Earning per share(EPS)	Dividend per share		
			Cash	Stock Dividend	Total
2003/04	295	27.5	10	-	10
2004/05	430	30.10	15	-	15
2005/06	850	43.67	18	-	18
2006/07	1375	43.50	20	-	20
2007/08	2350	59.94	40	-	40
2008/09	1750	54.68/	47.37	-	47.37

Source: NEPSE Index and appendix V(A)

Above the table show the BOK's MPS ,EPS and OPS from 2003/04 to Ry 2008/09 according to table no 4.13 it shows that he market price of BOK's share going to upward turning till fy 2007/08 then it market price was going on downward turning in fy 2008/09 according to table no.4.13 it shows that the market price of BOK's share going to upward turning till fy 2007/08. Then it market price was going downward turning in fy 2008/09 according to table market price per share is highest in fy 2007/08 and lowest in fy 2003/04 but earning price per share(EPS) was going to upward moving and gradually increasing year by year. EPS high in Fiscal year 2007/08 and lowest in fy 2003/04. DPS is going to upward and DPS is highest in fy 2008/09 and lowest in fy 2003/04

4.1.5.2:- Calculation of rate of return expected return standard deviation and coefficient of variation of common stock of BOK.

Rate of return for each year is calculated on the basic of closing price of common stock and dividend amount of respective year .Table no.4.14 shows

the calculation of year wise rate of return standard deviation and coefficient of variation.

TABLE NO.4.14

Calculation of Trend value

Fiscal year	Closing price(P)	Dividend(D)	$R = \frac{(P_t - P_{t-1}) + D_t}{P_{t-1}}$	[R- E(R)]	[R- E(R)] ²
2003/04	295	10	-	-	-
2004/05	430	18	0.5085	-0.026	0.0008
2005/06	850	18	01.02	0.4855	0.2357
2006/07	1375	20	0.6412	0.1067	0.114
2007/08	2350	40	0.7382	0.2037	0.0415
2008/09	1750	43.37	-0.2352	0.7697	0.5924
Total			2.6727		0.88118

Source :Table no.4.13

We have,

$$\begin{aligned} \text{Expected rate of return } E(R) &= \frac{\Sigma R}{n} \\ &= \frac{2.6727}{5} \\ &= 0.5345 \end{aligned}$$

$$\begin{aligned} \text{Standard deviation} &= \sqrt{\frac{\Sigma [R - E(R)]^2}{n - 1}} \\ &= \sqrt{\frac{0.8818}{5 - 1}} \\ &= \sqrt{0.22045} \\ &= 0.4695 \text{ or } 6.95\% \end{aligned}$$

$$\begin{aligned} \text{Coefficient of variation (C.V)} &= \frac{\sigma}{E(R)} \\ &= \frac{0.4695}{0.5345} \end{aligned}$$

$$= 0.8784$$

4.1.5.3:- Trend value for each year is calculated on the basis of rate of return of common stock of Bok respective year by using least square method as follows. Table No. 4.15 shows the calculation of trend value of common stock of BOK Ltd.

TABLE NO.4.15
Calculation of Trend value

Fiscal year	Rate of return(Y)	Deviation from year 2006/07(X)	XY	X ²	Trend value(Yc)
2004/05	0.5085	-2	-1.017	4	0.7005
2005/06	1.02	-1	-1.02	1	0.6175
2006/07	0.6412	0	0	0	0.5345
2007/08	0.7328	1	0.7382	1	0.4515
2008/09	0.2352	2	0.4704	4	0.3685
Total	2.6727	ΣX=0	-0.8284	10	

Source: Table No.4.14

We have,

$$\text{Trend equation is , } Y_c = a + bx$$

Where,

$$\Sigma X = 0, \quad a = \frac{\Sigma Y}{n} = \frac{2.6727}{5} = 0.5345$$

$$b = \frac{\Sigma XY}{\Sigma X^2} = \frac{-0.8284}{10} = -0.08284$$

Now, trend line equation is $Y_c = a + bx$

$$Y_c = 0.5345 + (-0.083) x$$

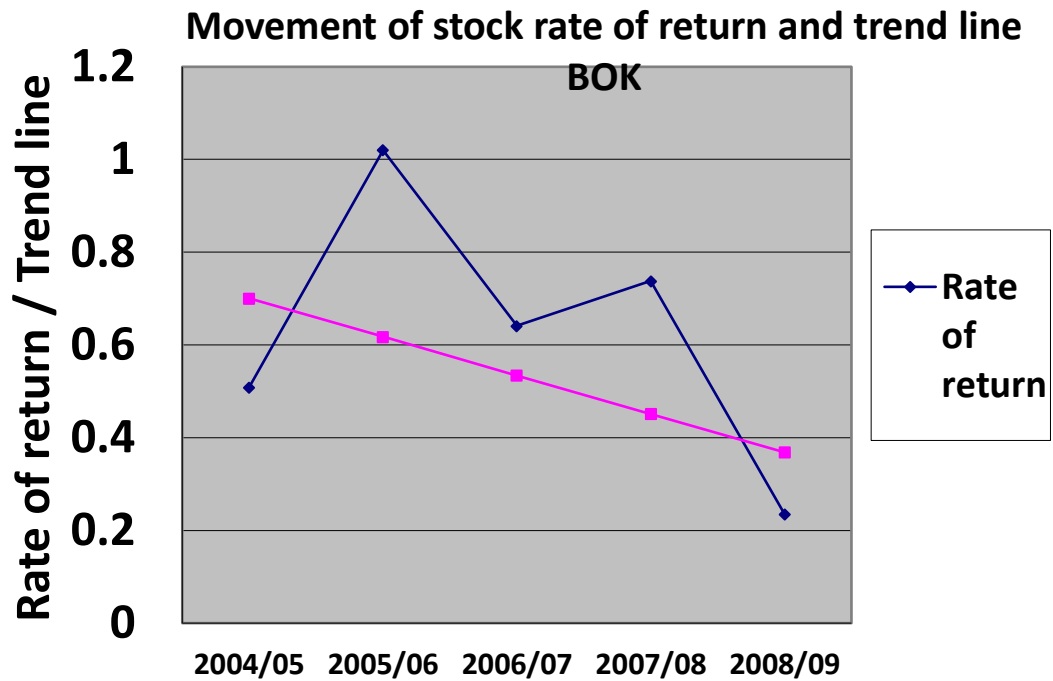
$$\text{When } x=(-2), Y_c = 0.5345 + (-0.083)*(-2) = 0.7005$$

$$\text{When } x=(-1), Y_c = 0.5345 + (-0.083)*(-1) = 0.6175$$

$$\text{When } x=(0), Y_c = 0.5345 + (-0.083)*(0) = 0.5345$$

$$\text{When } x=(1), Y_c = 0.5345 + (-0.083)*(1) = 0.4515$$

$$\text{When } x=(2), Y_c = 0.5345 + (-0.083)*(2) = 0.3685$$



Source:- Table No.4.15

Above diagram shows the movement of stock’s rate of return and trend line of BOK. In the beginning rate of return is average and positive. In Fy2005/06 is the highest return and Fy2008/09 has lowest which shows the negative return. Similarly Trend line is gradually downward and decreasing by the multiple of variable of (X).

4.2 INTER BANK COMAPRISON

4.2.1 ON THE BASIS OF RISK AND RETURN ANALYSIS:-

After analysis of expected return, standard deviation, coefficient of variation of each bank for the fiscal year 2003/04 to 2008/09 result are given in the following table.

Summary of Risk and return analysis

TABLE NO.4.16

S. N	Sample bank	Expected return $E(R)$	Standard Deviation(σ)	Coefficient of Variation(C.V)	Remark		
					E(R)	σ	C.V
1	NABIL	0.4898	0.4721	0.9638	Highest	Highest	
2	HBL	0.4548	0.3619	0.7957			
3	SCBNL	0.3939	0.2387	0.6060		Lowest	Lowest
4	EBL	0.36	0.4048	1.124	Lowest		Highest
5	BOK	0.5345	0.4695	0.8784			

Source:-result from table No. 4.2,4.5, 4.8, 4.11 and 4.14

The table shows that the investors can get the highest return from investing in common stock of BOK and lowest in investing in EBL's stock. Nepal Arab Bank Limited has highest standard deviation and SCBNL has lowest Standard deviation but coefficient of variation is best tools to make investment has different return and risk coefficient of variation measure the risk per unit. EBL has highest CV and SCBNL has lowest CV to earn one unit of return the investor has to bear 0.6060 unit of risk is SCBNL but 1.124 unit of risk bear to earn one unit in EBL. So, by considering the fact the best decision would be investing share of SCBNL.

4.2.2 ON THE BASIS OF MARKET CAPITILIZATION:-

Market capitalization of sampled commercial bank at the end of fiscal year 2008/09 is presented on Table No.4.17. Market capitalization is the total market value at specific time period of the company.

TABLE NO 4.17

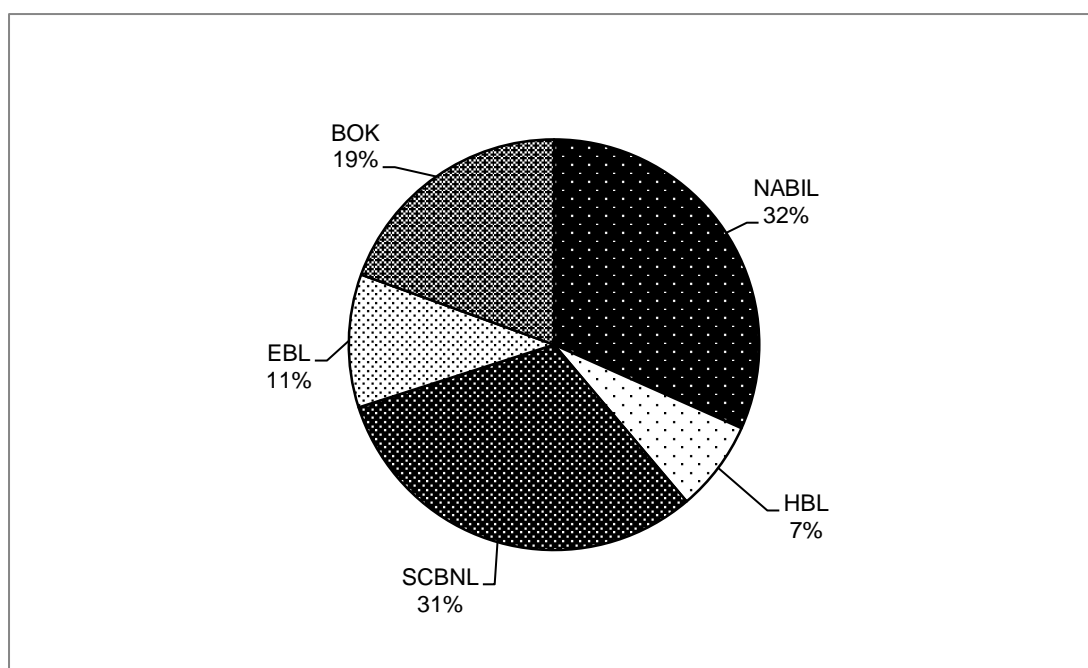
Inter Banking Comparison by capital

S.N	Sample Bank	Market Capitalization	Percentage of market share	Remark
1	NABIL	14193.58	31.66%	Biggest
2	HBL	3210.80	7.16%	Smallest
3	SCBNL	14002.80	31.23%	
4	EBL	4704.91	10.49%	
5	BOK	8718.41	19.45%	

Source:-NEPSE year ending data 2008/09

DIAGRAM 4.6

Above table No.4.17 data presented at following diagram.



The comparison is made on the movement of market capitalization. Here only 5 commercial banks are taken into consideration as their data cover the entire study period. On the basis of market capitalization NABIL is biggest and HBL is smallest among the sample banks.

4.3.1 ANALYSIS OF MARKET RISK AND RETURN ANALYSIS:-

When talking about the stock market in Nepal there is only one market that is NEPSE country's overall market movement is represented by market index i.e NEPSE index calculation Annual return Expected return, standard deviation and coefficient of variation of market is presented below in table no 4.18

Calculation of market risk and return
TABLE NO.7.18

Fiscal year	NEPSE Index(NI)	$R_m = \frac{NI_t - NI_{t-1}}{N_{t-1}}$	$[R_m - E(R_m)]$	$[R_m - E(R_m)]^2$
2003/04	204.80	-	-	-
2004/05	286.67	0.9997	0.1157	0.0133
2005/06	386.83.	0.3494	0.065	0.0042
2006/07	683.95	0.7681	0.4837	0.2340
2007/08	985.65	0.4411	0.1567	0.245
2008/09	456.93	-0.5364	-0.8208	0.6737
		1.4219		0.9497

Source :- NEPSE Index

We have,

$$\begin{aligned} \text{Expected rate of return } E(R_m) &= \frac{\sum R_m}{n} \\ &= \frac{1.4219}{5} = 0.2844 \end{aligned}$$

$$\begin{aligned} \text{Standard deviation } (\delta) &= \sqrt{\frac{[R_m - E(R_m)]^2}{n - 1}} \\ &= \sqrt{\frac{0.9497}{5 - 1}} \\ &= \sqrt{0.2374} = 0.4873 \end{aligned}$$

$$\begin{aligned} \text{Coefficient Of Variation (CV)} &= \frac{\delta}{E(R_m)} \\ &= \frac{0.4873}{0.2844} = 1.71 \end{aligned}$$

4.3.2 :- Trend value for market is calculated on the basis of rate of return on market index respective year by using least square method.

The following table shows the calculation of year wise expected return (Trend Value) of NEPSE Index

TABLE NO.4.19
Calculation of Trend Value for Market

Fiscal year	Rate of return(Y)	Deviation from FY 2006/07(X)	XY	X ²	Trend value(Y _c)
2004/05	0.3997	-2	-0.7994	4	0.6405
2005/06	0.3494	-1	-0.3494	1	0.4625
2006/07	0.7681	0	0	0	0.2844
2007/08	0.4411	1	0.4411	1	0.1663
2008/09	-0.5364	2	-1.0728	4	-0.0718
Total	∑Y=1.4219	∑X=0	-1.7805	10	

Source :- Table NO.4.18

We have,

$$\text{Trend equation } Y_c = a + bx$$

Where,

$$\Sigma X = 0 \quad , \quad a = \frac{\Sigma Y}{n} = \frac{1.4219}{5} = 0.2844$$

$$b = \frac{\Sigma XY}{\Sigma X^2} = \frac{-1.7805}{10} = -0.1781$$

New, Trend line equation is

$$Y_c = a + bx$$

$$Y_c = 0.2844 + (-0.1781) x$$

$$\text{When } x = (-2), Y_c = 0.2844 + (-0.1781) \times (-2) = 0.6405$$

$$\text{When } x = (-1), Y_c = 0.2844 + (-0.1781) \times (-1) = 0.4625$$

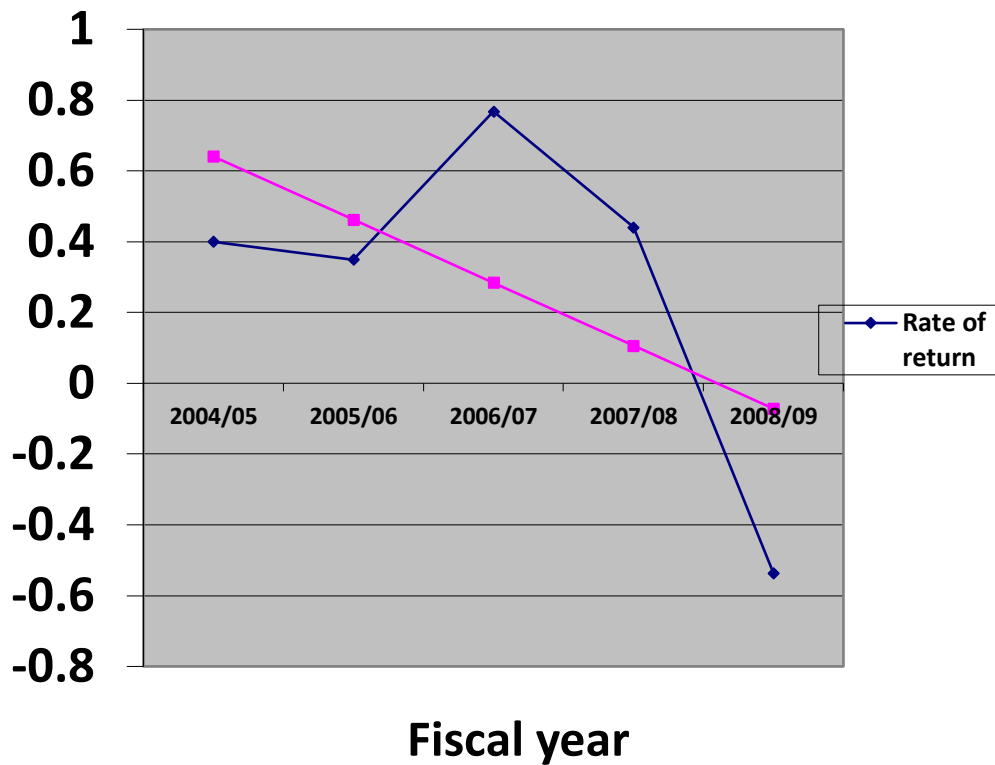
$$\text{When } x = (0), Y_c = 0.2844 + (-0.1781) \times (0) = 0.2844$$

$$\text{When } x = (1), Y_c = 0.2844 + (-0.1781) \times (1) = 0.1063$$

$$\text{When } x = (2), Y_c = 0.2844 + (-0.1781) \times (2) = -0.0718$$

DIAGRAM NO.7

Movement of stock rate of return and Trend line of market



Source:- Table No.4.19

Above diagram shows that movement of rate of returns and Trend line market. In the beginning trend value of return is high in F_y2004/05, but gradually downward in the upcoming year and get negative value. Similarly rate of return in F_y2006/07 is high and goes to negative and goes to negative return in F_y 2008/09.

4.4:- COMPARISON OF SAMPLE BANKS WITH MARKET:-

4.4.1 NEPAL ARAB BANK LIMITED (NABIL):-

TABLE NO.20

Statistical and Financial Tools	NABIL	Market
Expected Return E(R)	0.4898	0.2844
Variance(σ^2)	0.2228	0.2374
Standard Deviation(σ)	0.4721	0.4873
Coefficient of Variance(CV)	0.9638	1.71
Systematic risk ($\beta^2\sigma_m^2$)	0.0497	
Unsystematic risk(I^2)	0.1731	
Index of Systematic risk(β)	0.4564	1
Proportion of systematic risk (ρ^2)	0.2231	
Proportion of unsystematic risk($1-p^2$)	0.7769	
Alpha(α) = intercept	0.36	
Correlation with market(r)	0.9225	

Source = Table No.4.16 and 4.19 Appendix-II(B)

Expected return of NABIL bank is high or that market return which means common stock of NABIL banks expected rate of return is 1.72(0.4898/0.2844) times higher than the market return. Similarly standard deviation which means Total risk on return of NABIL bank is S.D of NABIL BANK is lower than market return or HBL's stock is more profitable than market return or, market return is more risky then HBL's stock.

Coefficient of variation is better than measure of risk because it measure risk per unit C.V of NABIL is less than C.V of market (0.9638<1.17) which means NABIL bank has less risk per unit return than market return.

BETA of NABIL bank is 0.4564 based on the yearly return during fiscal year 2003/004 to 2008/09. Beta of NABIL 0.4564($\beta < 1$) mean that return of NABIL bank is not volatile than the market return. So, it is called defensive asset. The intercept (α) is 0.36 it shows the return of NABIL bank when market return is zero.

The correlation with market is 0.9225. The positive correlation indicates that market return goes up return of NABIL is also goes up or vice versa.

The proportion of systematic risk is 0.2231, it indicates that the percentage of variation of NABIL's return explained by the change in the market return. Thus 22.3% risk of NABIL is explained by the market. It is called systematic risk and it cannot be diversified.

The $0.7769(1-P^2)$ residual variance is specific risk of the from it called unsystematic risk and it is diversifiable.

4.4.2:-HIMALAYAN BANK LIMITED (HBL):-

**TABLE NO.21
SUMMARY OF RISK AND RETURN FOR HBL AND MARKET**

Statistical and financial tools	HBL	Market
Expected return E(R)	0.4548	0.2844
Variance(σ^2)	0.1309	0.2374
Standard deviation(σ)	0.3619	0.4873
Coefficient of variance(CV)	0.7957	1.71
Systematic risk($\beta^2\sigma_m^2$)	0.0887	
Un-systematic risk(I^2)	0.0439	
Index of systematic risk(β)	0.6112	1
Proportion of systematic risk(P^2)	0.6646	
Proportion of unsystematic risk($1-P^2$)	0.3354	
Correlation with market(r)	0.8230	
Alpha (α) intercept	0.2810	

Source:-Table No. 4.16, 4.19 and Appendix II(B)

Expected return of HBL higher than market return which means HBL's return is $1.60(0.4548/0.2844)$ times higher than the market return.

Similarly standard deviation of HBL's lower than the market standard deviation which means total risk or HBL's stock is more profitable than market return or market return is more risky than HBL's stock.

Coefficient of variance is better measurement of risk because it measure risk per unit C.V of HBL is less than the C.V of market (i.e $0.7957 < 1.170$) which means common stock of HBL is less risk per unit than market.

Beta of HBL is 0.6112 based on the yearly return during fiscal year 2003/04 to 2008/09. A beta of ($\beta < 1$) means that HBL is less volatile than market return so it is called defensive assets.

The proportion of systematic risk 0.6646 this risk is the portion of total variability changed by the market. Thus 66.46% risk of the HBL is changed by the market. It cannot be diversified.

The $0.3354(1-P^2)$ residual variance is specific risk of the firm. It is called unsystematic and it is diversifiable.

The correlation with market is 0.8230. The positive correlation indicates that market return goes up and HBL's return also goes up or vice versa.

The intercept(α) is 0.2810 it shows that the HBL's return when market return is zero expected return of HBL is 28.10% when market earn nothing or zero.

4.4.3 STANDARD CHARTERED BANK Ltd (SCBNL):-

**TABLE NO.4.22
SUMMARY OF RISK AND RETURN FOR SCBNL AND MARKET**

Statistics	SCBNL	Market
expected return E(R)	0.3939	0.2844
Variance(σ^2)	0.0569	0.2374
Standard deviation(σ)	0.2378	0.4873
Coefficient of variance(CV)	0.6060	1.17
Systematic risk($\beta^2\sigma_m^2$)	0.034	
Unsystematic risk(1^2)	0.0229	
Index of systematic risk beta(β)	0.3786	1
Proportion of systematic risk(P^2)	0.5975	
Proportion of unsystematic risk($1-P^2$)	0.4025	
Correlation with market (r)	0.7721	
Alpha (α) intercept	0.3683	

Source:-Table No.4.14, 4.19 and Appendix III(B)

Expected return of common stock's SCBNL is higher than market return which means SCBNL's expected return is $1.38(0.3939/0.288)$ times higher than market return. Similarly standard deviation of SCBNL is less than standard deviation of market (i.e $0.2378 < 0.4873$)

Coefficient of variation is better measure of risk because it measure risk per unit C.V of SCBNL is lower than market (i.e $0.6060 < 1.17$) which means common stock of SCBNL has less risk per unit than market return.

Beta of SCBNL is 0.3786 based on the yearly return during fiscal year 2003/04 to 2008/09. A beta of 0.3786($\beta < 1$) means that SCBNL's return is volatile than market return. So it is called defensive assets.

Proportion of systematic risk is 0.5975 is the position of total variability changed by the market. Thus 59.75% risk of SCBNL is changed by the market. It cannot be diversified.

The $0.4025(1-P^2)$ residual variance is specific risk of the firm it is called asymmetric risk and it is diversifiable by the company.

The correlation with market is 0.7727. the positive correlation indicates that the market (NEPSE) return goes up SCBNL goes up or vice versa.

The intercept (α) is 0.3683 it shows that the SCBNL's return when market return is zero. Expected return of SCBNL is 36.83% when market return earns nothing.

4.4.4 EVEREST BANK Ltd (EBL):-

TABLE NO 4.23

Statistics	EBL	Market
Expected rate of return E(R)	0.36	0.2844
Variance(σ^2)	0.1639	0.2374
Standard deviation(σ)	0.4048	0.4873
Coefficient of variance(CV)	1.124	1.17
Systematic risk($\beta^2\sigma_m^2$)	0.1314	
Unsystematic risk(1^2)	0.0325	
Index of systematic risk beta(β)	0.7439	1
Proportion of systematic risk(P^2)	0.8017	
Proportion of unsystematic risk($1-P^2$)	0.1983	
Correlation with market (r)	0.9508	
Alpha (α) intercept	0.31	

Source:-Table No.4.16,4.19 and Appendix III(B)

Expected rate of stock of EBL is more than expected rate of return which means $1.27(0.36/0.2844)$ times higher than market return.

Similarly standard deviation of EBL is less than market standard deviation (i.e $0.4048 < 0.4873$) which means total risk on EBL is less risky than market.

Coefficient of variation is better measure of risk because it measures risk per unit CV of EBL is less than the CV of market (i.e $1.124 < 1.17$) which means EBL has less risk per unit.

Beta of EBL is 0.7439 based on the yearly return during the fiscal year 2003/04 to 2008/09. A beta of ($\beta < 1$) means stock of EBL is less volatile than market, so it is called defensive assets.

Proportion of systematic risk is 8017. This risk is proportion of total variability changed by the market. Thus 80.17% risk of EBL is changed by the market it is non diversifiable.

The $(1-P^2)$ residual variance is specific risk of the firm, it is called asymmetrical risk and it is diversifiable so company can be diversified only 19.83%.

The correlation with market is 0.9508. the positive correlation indicates that when market return goes up and EBL's return also goes up or vice versa.

The intercept (α) is 0.31 it shows the EBL's return when market return is zero. Hence, EBL returns 31% when market earns nothing.

4.4.5:-BANK OF KATHMANDU (BOK):-

**TABLE NO.4.24
SUMMARY OF RISK AND RETURN FOR BOK AND MARKET**

Statistics	BOK	Market
Expected rate of return E(R)	0.5345	0.2844
Variance(σ^2)	0.2204	0.2374
Standard deviation(σ)	0.4695	0.4873
Coefficient of variance(CV)	0.8784	1.17
Systematic risk($\beta^2\sigma_m^2$)	0.1456	
Unsystematic risk(I^2)	0.0748	
Index of systematic risk beta(β)	0.7839	1
Proportion of systematic risk(P^2)	0.6605	
Proportion of unsystematic risk($1-P^2$)	0.3395	
Correlation with market (r)	0.8127	
Alpha (α) intercept	0.3118	

Source:-Table No. 4.16, 4.19 and Appendix V(B)

Expected rate of BOK is higher than expected return of market by 1.88($0.5345/0.2844$) times than market return.

Similarly standard deviation of BOK is less than market standard deviation (i.e $0.4695 < 0.4873$) which means total risk of BOK is less than market.

Coefficient of variance of BOK is less than market coefficient variance (i.e $0.8784 < 1.17$) CV is better measurement tools for risk measurement which show risk per unit so CV of BOK is said that it is less risky than market.

Beta of BOK is 0.7839 based on the yearly return during the fiscal year 2003/04 to 2008/09. A beta ($\beta < 1$) means stock of BOK is less than market so it is called defensive assets.

Proportion of symmetric risk is 0.6605. This risk is proportion of total variability change by the market. Thus, 66.05% risk of BOK is changed by the market it is non diversifiable.

The $0.3395(1-P^2)$ residual variance is specific risk of the firm it is called asymmetrical risk and it is diversifiable.

The correlation with market is 0.8121. The positive correlation indicate that when the market return goes up then BOK's return also goes up or vice versa.

This intercept is 0.3118. It shows the BOK return when return is zero. Hence, BOK returns 31.18% when market earns nothing.

TABLE NO.4.25
SUMMARY OF RISK AND RETURN FOR SAMPLE BANK

Statics	NABIL	HBL	SCBNL	EBL	BOK
E(R)	0.4898	0.4548	0.3939	0.36	0.5345
(σ)	0.4721	0.3619	0.2578	0.4048	0.4695
σ^2	0.2228	0.1309	0.0569	0.1639	0.2204
CV	0.9638	0.7957	0.6060	1.124	0.8748
$\beta^2\sigma_m^2$	0.0497	0.0887	0.034	0.1314	0.1456
I^2	0.1731	0.0439	0.0229	0.0325	0.0748
β	0.4564	0.6112	0.3786	0.7439	0.7833
r	0.9225	0.6646	0.5975	0.8017	0.6605
P^2	0.2231	0.3354	0.4025	0.1983	0.3395
$1-P^2$	0.7769	0.8230	0.7727	0.9508	0.8127
A	0.36	0.2810	0.3683	0.31	0.3118

Source:- Table No 4.16 and appendix I(B) to V(B)

4.5 PRICE CALCULATION OF SELECTED BANKS BY (CAPM):-

CAPM model that assume stock's required rate of return is equal to risk free rate plus risk premium where risk is measured by Beta coefficient for this analysis risk free rate is measured which is taken from interest rate of Treasury Bill issued by Nepal Rastra Bank.

Calculation of required rate of return and price calculation by CAPM model.

TABLE NO 4.26

Sample bank	Beta(β)	$R_j=RF+(R_m-RF)\beta_j$	E(R)	Price situation
NABIL	0.4564	0.1706	0.4898	Under price
HBL	0.6112	0.2029	0.4548	Under price
SCBNL	0.2986	0.1543	0.3939	Under price
Ebl	0.7439	0.2308	0.36	Under price
BOK	0.7833	0.2390	0.5345	Under price

Source:- Table No 4.25 and website of NRB

Where,

$E(R)$ = expected rate of return

RF = risk free rate 0.075 or 7.5%

$E(R_m)$ = market rate of return 0.2844

β = beta of individual sample bank

All the stock of commercial bank are under priced because required rate of return is less than expected rate of return. As the stock are under priced investor can gain from buying the stock investor should buy these stock and who are holding they should not sell stock.

4.6 CORELATION BETWEEN BANKS:-

The correlation coefficient always lies between +1 and -1. Return of securities are very perfectly together when the correlation coefficient is +1 and

in perfectly opposite direction that there is -1. A zero correlation coefficient implies that there is no relation between return of securities plays a significant role in the risk reduced by portfolio construction.

4.6.1. CORELATION COEFFICIENT BETWEEN NABIL AND HBL BANK:-

The Table No.4.27 shows the calculation of correlation coefficient between NABIL and HBL bank.

TABLE NO.4.27
Let the rate of return common stock of NABIL is X
the rate of return common stock of HBL is Y

Year	X-E(X)	Y-E(Y)	[X-E(X)][Y-E(Y)]
2003/04	-	-	-
2004/05	0.0852	-0.0601	-0.0051
2005/06	0.0552	0.1571	0.0086
2006/07	0.8302	0.5234	0.4345
2007/08	-0.4258	-0.1899	0.0808
2008/09	-0.10398	-0.4307	0.0448
			0.5636

Source :- Table No.4.2 and 4.5

We have,

$$\begin{aligned} \text{covariance}(x,y) &= \frac{\sum[X-E(X)][Y-E(Y)]}{n-1} \\ &= \frac{0.5636}{5-1} = 0.1409 \end{aligned}$$

$$\begin{aligned} \text{Correlation coefficient}(r) &= \frac{\text{cov}(x,y)}{\delta x \delta y} \\ &= \frac{0.1409}{0.4721 * 0.3619} \end{aligned}$$

$$= 0.8245 \text{ or } 82.45\%$$

4.6.2. CORRELATION COEFFICIENT BETWEEN NABIL AND SCBNL:-

Table no.4.28 shows the calculation of correlation coefficient between NABIL and SCBNL.

Let,

Rate of return common stock of NABIL = x

Rate of return common stock of SCBNL = y

TABLE NO 4.28

Year	x-E(x)	y-E(y)	[x-E(x)][y-E(y)]
2004/05	0.0852	0.0187	0.0015
2005/06	0.0552	0.2731	0.0151
2006/07	0.8302	0.1902	0.1579
2007/08	-0.4258	-0.2227	0.0948
2008/09	-.01039	-0.2592	0.0269
			0.2962

Source:- Table No.4.2 and 4.8

We have,

$$\text{Covariance}(x, y) = \frac{\sum[x - E(x)][y - E(y)]}{n - 1}$$

$$= \frac{0.2962}{5 - 1}$$

$$= 0.07405$$

$$\text{Correlation coefficient}(r) = \frac{\text{cov}(x, y)}{\delta x \delta y}$$

$$= \frac{0.07405}{0.4721 * 0.2378}$$

$$= 0.6594$$

4.6.3.CORRELATION COEFFICIENT BETWEEN NABIL AND EBL BANK:-

The table No.4.29 shows the correlation coefficient between BANIL and EBL

Let,

Rate of return common stock of NABIL is x

Rate of return common stock of EBL is y

TABLE NO.4.29

Year	x-E(x)	y-E(y)	[x-E(x)][y-E(y)]
2004/05	0.0852	0.05	0.0043
2005/06	0.0552	0.39	0.0215
2006/07	0.8302	0.43	0.3569
2007/08	-0.4258	0.05	-0.0219
2008/09	-0.1039	-0.56	0.0582
			0.419

Source:- Table No.4.2 and 4.11

We have,

$$\text{Covariance}(x, y) = \frac{\sum[x - E(x)][y - E(y)]}{n - 1}$$

$$= \frac{0.419}{5 - 1} = 0.1047$$

$$\text{Corrrelation coefficient}(r) = \frac{\text{cov}(x, y)}{\delta x \delta y}$$

$$= \frac{0.1047}{0.4721 * 0.4048}$$

$$= 0.5481$$

4.6.4.CORRELATION COEFFICIENT WITH NABIL AND BOK BANK:-

The table No.4.30 shows the calculation of correlation coefficient between NABIL and BOK.

Let,

Rate of return common stock of NABIL is x

Rate of return common stock of BOK is y

TABLE NO.4.30

Year	x-E(x)	y-E(y)	[x-E(x)][y-E(y)]
2004/05	0.0852	-0.026	-0.0022
2025/06	0.0552	0.4855	0.0268
2006/07	0.8302	0.1067	0.0886
2007/08	-0.4258	0.2037	-0.0867
2008/09	-0.1039	-0.7697	0.0799
			0.1064

Source:-Table No4.2 and 4.14

We have,

$$\text{Covariance}(x, y) = \frac{\sum[x - E(x)][y - E(y)]}{n - 1}$$

$$= \frac{0.1064}{5 - 1} = 0.0266$$

$$\text{Correlation coefficient}(r) = \frac{\text{cov}(x, y)}{\delta x \delta y}$$

$$= \frac{0.0266}{0.4721 * 0.4695} = 0.120$$

4.6.5. CORRELATION BETWEEN HBL AND SCBNL BANK:-

Table No.4.31 shows the calculation of correlation between HBL and SCBNL. Let,

Rate of return on common stock of HBL is x

Rate of return on common stock of SCBNL is y

TABLE NO.4.31

Year	x-E(x)	y-E(y)	[x-E(x)][y-E(y)]
2004/05	-0.0601	0.0187	0.0011
2005/06	0.1571	0.2731	0.0429
2006/07	0.5234	0.1902	0.0995
2007/08	-0.1899	-0.2227	0.0423
2008/09	-0.4307	-0.2592	0.1116
			0.2974

Source:- Table No.4.5 and 4.8

We have,

$$\text{Covariance}(x, y) = \frac{\sum[x - E(x)][y - E(y)]}{n - 1}$$

$$= \frac{0.2974}{5 - 1} = 0.07436$$

$$\text{Correlation coefficient}(r) = \frac{\text{cov}(x, y)}{\delta_x \delta_y}$$

$$= \frac{0.07436}{0.3619 \times 0.2738} = 0.8639$$

4.6.6.CORRELATION BETWEEN HBL AND EBL BANK:-

Table No.4.32 shows the calculation of correlation coefficient between HBL and EBL bank.

Let,

Rate of return on common stock of HBL is x

Rate of return on common stock of EBL is y

TABLE NO.4.32

Year	x-E(x)	y-E(y)	[x-E(x)][y-E(y)]
2004/05	-0.0601	0.05	-0.0030
2005/06	0.1571	0.39	0.0613
2006/07	0.5234	0.43	0.2251
2007/08	-0.1899	0.05	-0.0095
2008/09	-0.4307	-0.56	0.2412
			0.5151

Source:-Table No.4.5 and 4.11

We have,

$$\text{Covariance}(x, y) = \frac{\sum[x - E(x)][y - E(y)]}{n - 1}$$

$$= \frac{0.5151}{5 - 1} = 0.1288$$

$$\text{Correlation coefficient}(r) = \frac{\text{cov}(x, y)}{\delta x \delta y}$$

$$= \frac{0.1288}{0.3619 * 0.4048} = 0.8792 \text{ or } 87.92\%$$

4.6.7.CORRELATION BETWEEN HBL AND BOK:-

Table No.4.33 shows the calculation of correlation coefficient between HBL and BOK.

Let,

Rate of return on common stock of HBL is x

Rate of return on common stock of BOK is y

TABLE NO.4.33

Year	x-E(x)	y-E(y)	[x-E(x)][y-E(y)]
2004/05	-0.0001	-0.026	0.0015
2005/06	0.1571	0.4855	0.0763
2006/07	0.5234	0.1067	0.0558
2007/08	-0.1899	0.2037	0.0387
2008/09	-0.4307	-0.7679	0.3315
			0.5030

Source :- Table No.4.5 and 4.14

We have,

$$\begin{aligned}\text{Covariance}(x, y) &= \frac{\sum[x - E(x)][y - E(y)]}{n - 1} \\ &= \frac{0.5030}{5 - 1} = 0.1258 \\ \text{Correlation coefficient}(r) &= \frac{\text{cov}(x, y)}{\delta x \delta y} \\ &= \frac{0.1258}{0.3619 * 0.4695} = 0.7404 \text{ or } 74.04\%\end{aligned}$$

4.6.8.CORRELATION COEFFICIENT BETWEEN SCBNL AND EBL:-

Table no.4.34 shows the calculation of correlation coefficient between SCBNL and EBL.

Let,

Rate of return on common stock of SCBNL is x

Rate of return on common stock of EBL is y

TABLE NO.4.34

Year	x-E(x)	y-E(y)	[x-E(x)][y-E(y)]
2004/05	0.0187	0.05	0.0009
2005/06	0.2731	0.39	0.1065
2006/07	0.1902	0.43	0.0818
2007/08	-0.2207	0.05	-0.0110
2008/09	-0.2592	-0.56	0.1452

Source:- Table No.4.8 and 4.11

We have,

$$\begin{aligned}\text{Covariance}(x, y) &= \frac{\sum[x - E(x)][y - E(y)]}{n - 1} \\ &= \frac{0.3234}{5 - 1} = 0.08085\end{aligned}$$

$$\begin{aligned}\text{Corrrelation coefficient}(r) &= \frac{\text{cov}(x, y)}{\delta x \delta y} \\ &= \frac{0.08085}{0.2378 * 0.4048} = 0.8399 \text{ or } 83.99\%\end{aligned}$$

4.6.9. CORRELATION COEFFICIENT BETWEEN SCBNL AND BOK:-

Table No.4.35 shows the calculation of correlation coefficient between SCBNL and BOK:-

Let,

Rate of return on common stock of SCBNL is x

Rate of return on common stock of BOK is y

TABLE NO.4.35

Year	x-E(x)	y-E(y)	[x-E(x)][y-E(y)]
2004/05	0.0187	-0.026	-0.0005
2005/06	0.2731	0.4855	0.1326
2006/07	0.1902	0.1067	0.02030
2007/08	-0.2207	0.2037	0.0449
2008/09	-0.2592	-0.7697	0.1995
			0.3968

Source:- Table No.4.8 and 4.14

We have,

$$\begin{aligned}\text{Covariance}(x, y) &= \frac{\sum[x - E(x)][y - E(y)]}{n - 1} \\ &= \frac{0.3968}{5 - 1} = 0.0392\end{aligned}$$

$$\begin{aligned}\text{Correlation coefficient}(r) &= \frac{\text{cov}(x, y)}{\delta x \delta y} \\ &= \frac{0.0992}{0.2378 * 0.4695} = 0.8522 \text{ or } 85.22\%\end{aligned}$$

4.6.10. CORRELATION COEFFICIENT BETWEEN EBL AND BOK:-

Table No.4.36 shows the calculation of correlation coefficient between EBL and BOK.

Let,

Rate of return on common stock of EBL is x

Rate of return on common stock of BOK is y

TABLE NO 4.36

Year	x-E(x)	y-E(y)	[x-E(x)][y-E(y)]
2004/05	0.05	-0.026	-0.0013
2005/06	0.39	0.4855	0.1983
2006/07	0.43	0.1067	0.0458
2007/08	0.05	0.2037	0.0102
2008/09	-0.56	-0.7697	0.4310
			0.675

Source:- Table No.4.11 and 4.14

We have,

$$\text{Covariance}(x, y) = \frac{\sum[x - E(x)][y - E(y)]}{n - 1}$$

$$= \frac{0.675}{5 - 1} = 0.1687$$

$$\text{Correlation coefficient}(r) = \frac{\text{cov}(x, y)}{\delta x \delta y}$$

$$= \frac{0.1687}{0.4048 * 0.4695} = 0.8879 \text{ or } 88.79\%$$

The Table No.4.37 shows the various correlation between each sample bank.

TABLE NO.4.37

Sample bank	NABIL	HBL	SCBNL	EBL	BOK
NABIL	1	0.8245	0.6594	0.5481	0.12
HBL		1	0.8639	0.8792	0.7404
SCBNL			1	0.8399	0.8522
EBL				1	0.8879
BOK					1

Source :- Table No.4.27,4.28,4.29,4.30,4.31,4.32,4.33,4.34,4.35 and 4.36

Above Table shows the correlation between sample bank's stock. There are positive correlation between various banks but there is no any bank which has negative correlation. If correlation between stock of bank are positive then

any part of risk cannot be reduced by diversification. On the other hand if the correlation between stock of banks are negative then by the proper combination of two stocks can reduce all the risk so in conclusion it can say that as long as correlation between securities is negative contraction of portfolio is beneficial.

4.7. presentation and analysis of data according to inferential analysis based on ANOVA or F-test:-

The presentation and analysis of data according to inferential analysis includes the study of regression analysis. Analysis of regression is designed to ascertain if there is some kind of relationship between the average return and variance fundamental variables of banks. In this context we are using only linear relationship. For the analysis, expected return of sample bank are taken as dependent variable and beta coefficient and correlation coefficient with market are chosen as independent variables.

4.7.1:-

Presentation and analysis of data according to inferential analysis based on ANOVA or F-test. The hypothesis is set out and the calculated value of F is compared with critical value of F a 5% level of significance with(N-1,K-1) degree of freedom.

The test is carried out on the basis of simple regression analysis. Simple regression analysis is applied as expected return E(R) as dependent and beta coefficient as independent variable.

The model is
 $Y = a + bx$

Where,

Y = expected return

a = intercept

x = beta coefficient

The regression equation is $E(R) = a + b(\beta)$

Regression as expected return E(R) depends on beta (β)

TABLE NO.4.38

S.N	SAMPLE BANK	DEPENDENT (X)	INDEPENDET (Y)	XY	X ²
1	NABIL	0.4898	0.4564	0.2235	0.2083
2	HBL	0.4548	0.6112	0.2779	0.3736
3	SCBNL	0.3939	0.3786	0.1491	0.1433
4	EBL	0.36	0.7439	0.2678	0.5534
5	BOK	0.5345	0.7833	0.4186	0.6136
		2.233	2.9734	1.3368	1.8922

Source:-Table No.4.25

The regression equation Y on x is

$$Y = a + bx$$

Now,

The required normal equation can be written as,

$$\sum Y = na + bx \dots\dots\dots 1$$

$$\sum XY = a \sum x + b \sum x^2 \dots\dots\dots 2$$

Substituting the value in normal equation 1 and 2

$$2.233 = 5a + 2.9734b \dots\dots\dots 3$$

$$1.3368 = 2.9734a + 1.8922 b \dots\dots\dots 4$$

By solving equation 3 and 4 we get

$$a = 0.1041$$

$$b = 0.715$$

Hence,

The regression equation Y on X is

$$Y = a + bx$$

$$Y = 0.4041 + 0.715 (X)$$

$$\hat{Y} = 0.4041 + 0.715(X)$$

Now,

Analysis of variance of regression line (ANOVA)

TABLE NO.4.39

Sample bank	Y	(Y- \tilde{Y})	(Y- \tilde{Y}) ²	\hat{Y}	(\hat{Y} - \tilde{Y})	(\hat{Y} - \tilde{Y}) ²
NABIL	0.4898	0.0432	0.0017	0.4367	-0.0099	0.0000
HBL	0.4548	0.0082	0.0001	0.4478	0.0012	0.0000
SCBNL	0.3939	-0.0527	0.0028	0.4309	-0.0157	0.0002
EBL	0.36	-0.0866	0.0075	0.4573	0.0107	0.0001
BOK	0.5345	0.0879	0.0077	0.4601	0.0135	0.0002
	2.2330		0.0198			0.0005

Now,

$$\tilde{Y} = \frac{\sum Y}{N} = \frac{2.233}{5} = 0.4466$$

Here,

$$\text{Total variation (SST)} = \sum(Y - \tilde{Y})^2 = 0.0198$$

$$\text{Explained variation (SSR)} = \sum(\hat{Y} - \tilde{Y})^2 = 0.0005$$

$$\begin{aligned} \text{Unexplained variation (SSE)} &= \text{SST} - \text{SSR} \\ &= 0.0198 - 0.0005 \\ &= 0.0193 \end{aligned}$$

HYPOTHESIS FORMULATION

NULL HYPOTHESIS (H_0); $b=0$, i.e the regress on equation Y on X is not significant. In other words, there is no relationship between dependent variable Y and independent variable X.

ALTERNATIVE HYPOTHESIS (H_1); $b \neq 0$, i.e the regression equation Y on X is significant. In other words there is relationship between independent variable X and dependent variable Y.

TEST STATISTICS:-

Under H_0 the test statistics is

$$F = \frac{\text{MSR}}{\text{MSE}}$$

TABLE NO.4.40**ANOVA TABLE**

SOURCE OF VARIATION	SUM OF SQUARE	DEGREE OF FREEDOM	MEAN SUM OF SQUARE	F-RATIO
EXPLAINED VARIATION	SSR = 0.0005	K-1 = 2-1 =1	MSR=SSR/K-1=0.0005	MSR/MSE =0.0005/0.0064 =0.0781
UNEXPLAINED VARIATION	SSE = 0.0193	N-5=5-2=3	MSE=SSR/N-K =0.0064	
TOTAL VARIATION	0.0198	N-1=5-1=4		

The critical values of F at 5% level of significance for the degree of freedom(113) is 10.1. Hence calculate value of F is less than critical value i.e(10.1>0.0787) of at 5% level of significance.

$$\text{Coefficient of determination } (R^2) = \frac{\text{SSR}}{\text{SST}} = \frac{0.0005}{0.0798} = 0.0253$$

TABLE NO.4.41**REGRESSION OF EXPECTED RETURN ON BETA COEFFICIENT**

DEPENDENT VARIABLE	INERCEPT (a)	REGRESSION COEFFICIENT OF BETA(b)	R²	CALCULAT ED F	TABULAT ED F
E(R)	0.4041	0.0715	0.0253	0.0781	10.1

Source:-Table No.4.40

The result presented in the above table shows the regression result which is positive relationship between expected return and beta. One rupee increase in beta leads to 0.0715 rupee increase in E(R) keeping other variables constant .The coefficient of determination (R²) is 0.006 which indicate that 2.53% of total variation in expected return can be explained by beta calculated value of F is less than tabulated value of F at 5% level of significance, which means we accept H₀=0, i.e regression equation Y on X is not significant. In other words there is no relationship between independent variable X and dependent variable Y.

4.7.1:- The presentation and analysis of beta according to inferential analysis based on ANOVA or F-test. The hypothesis is set out and calculated value of F is compared with tabulated value of F at 5% of level of significance with (N-1, K-1) degree of freedom. The test is carried out on the basis of multiple regressions.

Multiple regression analysis is applied on expected return as dependent and coefficient of beta and correlation with market as independent variable. For this purpose following model is applied.

The model is $Y = a + b_1x_1 + b_2x_2$

Where,

Y = expected return E(R)

a = intercept

x_1 = beta coefficient (β)

x_2 = correlation with market (r)

b_1 = regression coefficient

b_2 = regression coefficient

TABLE NO.4.42
Regression As Expected Return E(R) depends On Beta (β) And Correlation With Market (r)

S.N	SAMPLE BANKS	Y	x_1	x_2	Yx_1	Yx_2	$x_1 x_2$	x_1^2	x_2^2
1	NABIL	0.4898	0.4564	0.2231	0.2235	0.1093	0.1026	0.2083	0.0498
2	HBL	0.4548	0.6112	0.6646	0.2779	0.3023	0.4062	0.3736	0.4417
3	SCBNL	0.3939	0.3786	0.5975	0.1491	0.2354	0.2262	0.1433	0.3570
4	EBL	0.36	0.7439	0.8017	0.2678	0.2886	0.5964	0.5534	0.6427
5	BOK	0.5345	0.7833	0.6605	0.4187	0.3530	0.5174	0.6136	0.4363
		2.233	2.9734	2.9474	1.337	1.2886	1.8484	1.8922	1.9275

Source:- Table No.4.15 and 4.25

The regression equation Y on x_1 and x_2 is

$$Y = a + b x_1 + b x_2$$

The required normal equation can be written by,

$$\sum Y = Na + b \sum x_1 + b \sum x_2 \dots\dots\dots 1$$

$$\sum Yx_1 = a\sum x_1 + b \sum x_1^2 + b \sum x_1x_2 \dots\dots\dots 2$$

$$\sum Yx_2 = a\sum x_2 + b \sum x_1x_2 + b \sum x_2^2 \dots\dots\dots 3$$

Substituting the value in normal equation, we get

$$2.233 = 5a + 2.9734 + 2.9474b_2 \dots\dots\dots 4$$

$$1.337 = 2.9734a + 1.8922b_1 + 1.8484 \dots\dots\dots 5$$

$$1.2866 = 2.9474a + 1.8484 + 1.9275b_2 \dots\dots\dots 6$$

Solving the equation 1, 2 and 3 we get

$$a = 0.8485$$

$$b_1 = -1.08$$

$$b_2 = 0.4077$$

Hence, regression equation Y on x₁ and x₂ be,

$$Y = a + b_1x_1 + b_2x_2$$

$$\text{Or, } Y = 0.3485 + (-1.08) x_1 + 0.4077x_2$$

$$\text{Or, } Y = 0.8485 - 1.08x_1 + 0.4077x_2$$

It can also be written as

$$\hat{Y} = 0.8485 - 1.08x_1 + 0.4077x_2$$

Now,

Analysis of variance of regression line (ANOVA)

TABLE NO.4.43

SAMPLE BANK	Y	(Y- \hat{Y})	(Y- \hat{Y}) ²	\hat{Y}	(\hat{Y} - \bar{Y})	(\hat{Y} - \bar{Y}) ²
NABIL	0.4898	0.0432	0.0017	0.4367	-0.0099	0.0000
HBL	0.4548	0.0082	0.0001	0.4478	0.0012	0.0000
SCBNL	0.3939	-0.0527	0.0028	0.4309	-0.0157	0.0002
EBL	0.36	-0.0866	0.0075	0.4573	0.0107	0.0001
BOK	0.5345	0.0879	0.0077	0.4601	0.0135	0.0002
	2.233		0.0198			0.0005

We have,

$$\tilde{Y} = \frac{\sum Y}{N} = \frac{2.233}{5} = 0.4466$$

Here,

$$\text{Total variation (SST)} = \sum (Y - \tilde{Y})^2 = 0.0198$$

$$\text{Explained variation (SSR)} = \sum (\hat{Y} - \tilde{Y})^2 = 0.0005$$

$$\text{Unexplained variation (SSE)} = \text{SST} - \text{SSR}$$

$$= 0.0198 - 0.0005$$

$$= 0.0193$$

HYPOTHESIS FORMULATION:-

NULL HYPOTHESIS (H₀); $b_1 = b_2 = 0$, i.e the regression equation on Y on x_1 and x_2 is not significant. In other words there is no relationship between dependent variable Y and independent variable x_1 and x_2 .

ALTERNATIVE HYPOTHESIS (H₁); $b_1 \neq b_2 \neq 0$, i.e the regression equation Y on x_2 is significant. In other words there is relationship between dependent variable Y and independent variable x_1 and x_2 .

TEST STATISTICS:-

Under H₀ the test statistics is

$$F = \frac{\text{MSR}}{\text{MSE}}$$

TABLE NO.4.44

SOURCE OF VARIANCE	SUM OF SQUARE	DEGREE OF FREEDOM	MEAN SUM OF SQUARE	F-RATIO
EXPLAINED VARIATION	SSR = 0.0005	K-1=3-1=2	MSR=SSR/K-1 =0.0005/2 =0.00025	F=MSR/MSE =0.00025/0.00965 =0.026
UNEXPLAINED VARIATION	SSE=0.0198	N-K=5-3 =2	MSE=SSE/N-K = 0.0198/2 =0.00965	
TOTAL VARIATION	SST=0.0198	N-1=5-1=4		

The critical value of F at 5% level of significant for (2,2) degree of freedom is 19. Hence, critical value of F is greater than calculated value of F.

$$\text{coefficient of determination}(K^2) = \frac{SSR}{SST}$$

$$= \frac{0.0005}{0.0198} = 0.0253 \text{ or } 2.53\%$$

The multiple regression result is presented in Table No.4.45. Regression of expected return on beta and correlation coefficient.

TABLE NO.4.45
Multiple Regression result presented

DEPENDENT VARIABLE	INTERCEPT a	REGRESSION COEFFICIENT		R ²	F- VALUE	
		b ₁	b ₂		CALCULATED	TABULATED
E(R)	0.8485	-1.08	0.4077	2.53	0.026	19

Source:- Table No.4.43 and 4.44

The above result presented in above table shows that the multiple linear relationship between E(R), beta (β) and correlation with market(r). One percent increase in beta causes 1.08 or (108%) percent decrease in E(R) holding other variable constant. Expected return and coefficient of market shows the positive relation which makes increase in expected return. The value of multiple coefficient determination (R²) in 2.5% which indicates that 2.53% of total variation in average return can be explained by independent variable.

F statistic shows the regression equation is not significant, i.e there is no relationship between dependent variable and independent variable since calculated value of F is less than tabulated value of F as 5% level of significance. So, regression model cannot be explained by the variation.

4.8 FINDING OF THE STUDY:-

Finding of the study is very important part of the study. All the people, investors, bankers, researchers and others who are related to investment on

common stock may gain advantage from the finding of the study. It is the outcome and follower to the analysis and interpretation of data. Findings rely on the identification whether the problem and purpose of the study has meet its objective or not. From the analysis of this study the major result on risk and return analysis of common stock investment in Nepalese commercial banks are summarized as under

On the basis of dividend paying NABIL STANDARD CHARTERED BANK NEPAL, and HBL are the highest and continuous dividend payer as EBL bank is lowest dividend payer among the sample of banks during sample period. Those people or investors who want to have a continuous return then NABIL, SCBNL and HBL bank is the best sample banks on the basis of dividend paying.

expected return on common stock of BOK Bank Ltd. Is the highest among? Five sample banks whereas EBL has lowest expected return.

On the basis of standard deviation, standard dividend, it measures total risk on the basis of S.d common stock of NABIL is more risky and SCBNL is less risky.

Co-efficient of variation measure risk per unit so co-efficient of variation is more rational basis for investment decision. On the basis of CV common stock of SCBNL has lowest CV. So common stock of SCBNL is least risky among sample bank where as CV of NABIL is highest. So common stock NABIL is more risky.

Calculation of trend value by using least square method on the basis of rate of return is presented and trend line graphically shown .movement of trend line has decreasing trend.

According to inter-bank market capitalization, NABIL is in highest position and HBL bank in the lowest position.

Beta co-efficient measures the symmetric risk and explain the sensitivity or volatility of stock with market. In this contest, common stock of BOK is most and SCBNL's stock is least volatile. Common stock of all sampled bank are defensive because all bank has beta coefficient less than one, i.e $\beta < 1$.

Alpha is the intercept where the characteristic line intercepts the vertical axis. Alpha is the an estimate of assets return when market return is zero SCBNL has highest alpha and HBL has lowest alpha among the sampled bank on the basis of alpha analysis SCBNL is the best.

Correlation coefficient lies between (+1) and (-1). All the sample banks have positive correlation with market. The positive correlation indicates that when the market return goes up. Return on common stock also goes up and vice versa correlation coefficient of EBL is highest and NABIL is lowest.

Correlation coefficient between the banks is shown in the correlation matrix table No.4.37. There is positive correlation between various bank if the correlation between stocks of banks are positive then any part of risk cannot be reduced. But correlation between all banks has positive so there is no change to reduce the risk and proper combination of two stocks. In conclusion it can be said that as long as correlation between securities is negative construction of portfolio is beneficial.

Common stock of HBL has highest portion of systematic risk which cannot be minimized through diversification where as common stock of SCBNL has lowest proportion of systematic risk.

Lower the coefficient of determination or proportion of systematic risk means higher the proportion of unsystematic risk. That means common stock of SCBNL has highly diversification risk while common stock of HBL has less diversifiable risk. Asymmetric risk can be avoided through diversification from above analysis, investor are recommendation to purchase there stock with highly expected return and with low proportion of undiversifiable risk to made portfolio investment.

Capital assets pricing model describes that the relationship between risk and return. Stock is identifies as overpriced or underpriced by comparison between expected rate of return and required rate of return. If required rate of return is less than expected rate of return than the stock is under priced and should buy it if required rate of return is more than expected rate of return the stock is

overpriced and should sell it. This study shows that all stocks are underpriced and investor should buy it.

Regression result suggest that beta coefficient have negative effect upon expected return. It means when beta decreases the riskiness of the firm will also decrease and vice-versa.

F-statistics in simple and multiple regression analysis shows that regression equation is not significant at 5% level of significance so the model cannot be explain the variation. This implies to investors that dependent variable unable to best explain the dependent variable and there should be increase in independent variable so as to better explanation of dependent variable.

CHAPTER 5

SUMMARY, CONCLUSION AND RECOMMENDATIONS:-

The last chapter deals with three heading, summary conclusion and recommendation, summary of the study describes the contents and format of the study. The conclusion from the whole study are presented in the conclusion from the whole study are presented in the conclusion heading researcher feels free to express their conclusion and make generalization. Lastly the recommendation heading is death with the recommendation are largely based upon the interpretation presented in the previous section of the study. Justification for this recommendation are related to theory structure and finding.

5.1. SUMMARY:-

Financial institutions play vital role for the economic growth and development of the country. They promote and facilitate the trade and industry. They provide the loan to various sectors likely industrial sector, agricultural sector, service sector and government sector. The investment in such sector helps to create the employment opportunity and helps to activate the poverty. Regarding the fact it is considered that development of the financial institution is the development of the country but the development of the financial institution depends upon the efficient financial management. Various decisions are taken for the financial management relating to different aspect of the financial risk and return is the one of importance aspects of the financial decision. The stock holders are interested to know about the risk and return of common stock investment in financial institutions. The relationship between risk and return is described by investor's perception about risk and their demand for compensation. No investor will like to invest in risky assets unless he assured of adequate compensation for the acceptance of risk. Hence, risk plays a central role for the analysis of investment.

The term return and investment are always associated because it is the return that motivates to accept the challenge. It strengthens the will power to assume risk. Each and every kind of return is associated with same degree of risk. Generally investor invests their current cash only to those where there is high return and low risk. An investor looking for their common stock investment pays the price for stock based on his estimation about future dividends and growth in stock price. This study occupies an important role in the development of stock market. Besides commercial bank development banks are investing their performance in Nepalese banking sector as well as finance company and co-operative organization and micro finance are growth in the rural area there are no big organization. Thus the study is dedicated on the study of risk and return on common stock of selected commercial banks which has been divided into five chapter starting with Introduction, Review of literature, Research methodology, Presentation interpretation and Analysis of data and finally Summary, Conclusion and Recommendation, Various financial, Accounting and Statistical tools are applied for the study, e.g rate of return, expected rate of return, standard deviation, coefficient of variation, beta coefficient, correlation coefficient, coefficient of determination, least square method, regression equation etc. analysis of the variance also examined in the study the hypothesis is set out to confirm the study and so on.

Different diagram, table, graph are used to present the result. All the data are collected from the secondary sources. Secondary sources of data are NEPSE, AGM report of sample bank, trading report of SEBO, Website of NRB etc.

5.2. CONCLUSION:-

The major conclusion extracted from the inter-bank analysis of risk and return position under study are listed in the following ways:-

- 1) Expected return of BOK has highest and EBL has lowest among five sample commercial bank. But common stock of NABIL and BOK Ltd. is more risky than other bank because it has highest standard deviation.

SCBNL has lowest risk and average expected return but EBL has highest risk than the expected return among the sample banks. As coefficient of variation is more rational basis of investment decision SCBNL has lowest risk per unit of return among various sample banks, so SCBNL have average return having lowest risk per unit. Trend line of equation based on rate of return of common stock of each bank has decreasing trend. In fact trend value is high in the beginning and slowly moves downward. Beta coefficient measures the systematic risk and explains the sensitivity or volatility of stock with market. In this context the common stock of all sample bank is defensive because it has beta less than beta coefficient of market i.e ($\beta < 1$). Alpha is the intercept which shows the return when market return is zero. Hence, SCBNL is best among five sample banks. In the context of dividend paying SCBNL, NABIL, BOK and NBL is continuous dividend payer among five sample banks.

- 2) Correlation coefficient lies between +1 and -1. The entire sample banks positive correlation with market. No any correlation between bank and market have negative. So, there are no chances to minimize the risk by diversification.
- 3) Common stock of NABIL has the highest proportion ratio of systematic risk and EBL has lowest which cannot be minimized through diversification. Similarly NABIL has lower unsystematic risk which means it can be diversified and EBL has highest proportion of unsystematic risk which can be diversified.
- 4) On the basis of capital assets pricing model the study shows that all the stock of commercial bank are underpriced.
- 5) Analysis of variance I simple and multiple regression shows the insignificant result at 5% level of significance i.e there is no relationship between dependent and independent variable. Hence, the model cannot explain the variation.

The conclusion based on the data analysis, interpretation and major finding states that although there is very common saying of “ Higher the risk

higher the return and lower the risk lower the return”. However the study does not support the proverb in case of commercial bank. The case of lower risk and higher return is also found. In short it is concluded that higher the risk, higher the return and lower the risk, lower the return is not appropriate.

5.3 RECOMMENDATION:-

Investor is different for capital market development. Investor are guided by most of the factor, capital market is dynamic. The level of understanding of investor cause market movement in capital market accordingly sharp fall of 1994 is evidence. The more an investor understands the market, the more sustainable the market will be.

Common stock is more risky security among all the market securities. Therefore an investor must have proper knowledge and information to take an investment decision. Before making an investment decision in stock market, the investor should analyze the market situation carefully by analyzing your own risk and return needs and requirement. Make several discussions with stock brokers and make your decision on the basis of reliable information rather than rumor and imagination. Investor can join to investors groups and share experience, ideas and express to each other.

Basically the study has focused on the individual investors. Moreover the components of stock market also considered to some extent. Based on the analysis of data and major finding of this research following recommendation and suggestion are prescribed:-

- 1) Since the return of BOK for given sample period is the highest, investor can invest in the common stock of BOK to get more benefit.
- 2) Expected return on common stock of EBL is lowest for sample period. So, investors cannot get benefit if they invest in common stock of EBL.
- 3) Beta of all sampled bank is less than one i.e ($\beta < 1$) which is defensive stock investor can use the stock of bank to minimize portfolio.
- 4) If the investor is risk averter then he/she can choose the stock investor of SCBNL of investor is risk seeker he/she can choose stock of BOK.

- 5) To access the portfolio investment it is better measure the coefficient of variation. ev is measure of relative dispersion. It measure risk per unit and is more useful than standard deviation of a given security.
- 6) Correlation co-efficient between all sampled banks are positive correlation coefficient. Such that investor cannot construct minimize portfolio if there is negative correlation with any bank than construct minimum portfolio.
- 7) Proportion of asymmetric of diversifiable risk on common stock of EBL bank is 0.9508. Investors are suggested to invest into stack of EBL to minimize the risk of portfolio. Since, the correlation co-efficient both market and stock of EBL is least it could help to construct the optimal portfolio.
- 8) This study find out that the stock is sampling has higher return then market return under CAPM approach all the stocks are underpriced. New investors are suggested to purchase and who are holding the stock of commercial bank they do not sell the stock.

However this study is done under the certain limitation both methodologies as well as scope limitation further research in this field will give more information to investor, marketers and so on.

- 9) Risk and return analysis is completely untouched area in Nepalese context. It is strongly suggested that further study should be conducted on this topic and research should include maximum number of sample bank and long period of data to get more and much information about this area.
- 10) It is recommended to use financial accounting statistical and least tools and technique for analysis of risk and return.
- 11) Administration should be made further efficient to check the performance of individual commercial bank flow of information should be more regular.
- 12) Lack of information with regard to trading procedure in NEPSE is also for volume of trading.

- 13) NEPSE needs to initiate to develop different programs for private such as meeting and similar in different subject matter relating to investment like trading rules and regulation.
- 14) Government need to make rule and regulation regarding the stock market and make policy that project the individual invests rights.
- 15) Due to lack of information, time and financial possibility there is only five sample commercial bank are taken in above 29 commercial bank are operating till the financial year 2008/09

Appendix I (B)
Calculation of Beta Coefficient of the common stock of NABIL and Market

Fiscal Year	[R-E(R)]	[Rm-E(Rm)]	[Rj-E(R)] [Rm-E(Rm)]
2004/05	0.0852	0.1157	0.0099
2005/06	0.0552	0.065	0.0035
2006/07	0.8302	0.4837	0.4016
2007/08	-0.4258	0.1567	-0.0557
2008/09	-0.1039	-0.8208	0.0853
Total			0.4337

Source: Table No. 4.2 and 4.18

We have,

$$\begin{aligned} \text{Cor}(R_j R_m) &= \frac{\sum [R - E(R)][R_m - E(R_m)]}{n-1} \\ &= \frac{0.4337}{5-1} \\ &= 0.1084 \end{aligned}$$

$$B_j = \frac{\text{cor}(R_j R_m)}{\sigma^2_m} = \frac{0.1084}{0.2374} = 0.4564$$

$$\text{Systematic Risk} = B^2 \sigma^2_m(\text{var}) = (0.4563)^2 \times 0.2374 = 0.0497$$

Unsystematic risk = Total Risk - Systematic risk

$$= 0.2228 - 0.0497$$

$$= 0.1731$$

$$\text{Proportion of Systematic risk } (p^2) = B^2 \sigma^2_m(\text{var}) = (0.4563)^2 \times 0.2374$$

$$\text{System risk} = \beta^2 \sigma^2_m(\text{var}) = (0.4564)^2 \times 0.2374$$

$$= 0.0497$$

Unsystematic risk (l^2) = Total risk - systematic risk

$$= 0.2228 - 0.0497$$

$$= 0.1731$$

$$\begin{aligned} \text{Proportion of systematic risk } (\rho^2) &= \frac{\beta^2 \sigma^2_m}{\text{var}(\sigma)^2} \\ &= \frac{0.0497}{0.2228} \\ &= 0.2231 \end{aligned}$$

$$\begin{aligned} \text{Proportion of unsystematic risk } (1 - \rho^2) &= \frac{l^2}{\text{var}(\sigma)^2} \\ &= \frac{0.1731}{0.2228} \\ &= 0.7769 = 77.69\% \end{aligned}$$

Proportion of unsystematic risk ($1 - \rho^2$) = $1 - p^2$

$$= 1 - 0.22319$$

$$= 0.7769$$

$$\begin{aligned} \text{Correlation coefficient}(r) &= \frac{\text{cor}(R_j R_m)}{\sigma_m \sigma_j} \\ &= \frac{0.1084}{0.4874 \times 0.4721} \\ &= 0.9225 \text{ or } 0.9669 \text{ or } 96.69\% \end{aligned}$$

$$\begin{aligned} \text{intercept} &= E(R) - E(R_m) \times \beta \\ &= 0.4898 - 0.2844 \times 0.4564 \\ &= 0.36 \text{ or } 36\% \end{aligned}$$

Appendix II (B)
Calculation of coefficient Beta of common stock of L+BC and Market

Fiscal year	[R-E(R)]	[Rm-E(Rm)]	[R-E(R)] [Rm-E(Rm)]
2004 / 05	-0.0601	0.1157	-0.0069
2005 / 06	0.1571	0.065	0.0102
2006 / 07	0.5234	0.4837	0.2532
2007 / 08	-0.1899	0.1567	-0.0298
2008 / 09	-0.4307	-0.8208	0.3535

Source: Table No. 4.5 and 4.18

We have,

$$\begin{aligned} \text{Cor}(R, R_m) &= \frac{\sum [R-E(R)] [R_m-E(R_m)]}{n-1} \\ &= \frac{0.5802}{5-1} = 0.1451 \\ \beta_j &= \frac{\text{cor}(R_j R_m)}{\sigma_m^2} \\ &= \frac{0.1451}{0.2374} \\ &= 0.6112 \end{aligned}$$

$$\begin{aligned} \text{Systematic risk} &= \beta^2 \sigma^2 m = (0.6112)^2 \times 0.2374 \\ &= 0.08868 \text{ or } 88.7\% \end{aligned}$$

$$\begin{aligned} \text{Unsystematic risk } (l^2) &= \text{Total risk} - \text{systematic risk} \\ &= 0.1309 - 0.0887 \\ &= 0.0439 \end{aligned}$$

$$\begin{aligned} \text{Proportion of systematic risk } (\rho^2) &= \frac{\beta^2 \sigma^2 m}{\text{var}(\sigma^2)} \\ &= \frac{0.087}{0.1309} = 0.6646 \text{ or } 66.46\% \end{aligned}$$

$$\begin{aligned} \text{Proportion of unsystematic risk } (1 - \rho^2) &= \frac{l^2}{\text{var}(\sigma^2)} \\ &= \frac{0.0439}{0.1309} \\ &= 0.3354 \text{ or } 33.54\% \end{aligned}$$

$$\begin{aligned} \text{Correlation coefficient}(r) &= \frac{\text{cor}(R_j R_m)}{\sigma_j \sigma_m} \\ &= \frac{0.1451}{0.3618 \times 0.4874} \\ &= 0.8230 \end{aligned}$$

$$\begin{aligned} \text{intercept} &= E(R) - E(R_m) \times \beta \\ &= 0.4548 - 0.2844 \times 0.6112 \\ &= 0.2810 \end{aligned}$$

Appendix III(B)

Calculation of coefficient Beta of common stock of SCBNL and market

Fiscal year	[R-E(R)]	[Rm-E(Rm)]	[R-E(R)] [Rm-E(Rm)]
2004 / 05	0.0187	0.1157	0.0022
2005 / 06	0.2731	0.065	0.0177
2006 / 07	0.1902	0.4837	0.0920
2007 / 08	0.2227	0.1567	0.0349
2008 / 09	-0.2592	-0.8208	0.2127

Source: Table No. 4.8 and 4.18

We have,

$$\text{Cor}(R_j, R_m) = \frac{\sum [R_j - E(R_j)] [R_m - E(R_m)]}{n-1}$$

$$= \frac{0.3595}{5-1} = 0.0899$$

$$\beta_j = \frac{\text{Cor}(R_j, R_m)}{\sigma_m^2}$$

$$= \frac{0.0899}{0.2374}$$

$$= 0.3786$$

$$\text{Systematic risk} = \beta^2 \sigma_m^2 = (0.3786)^2 \times 0.2374$$

$$= 0.034 \text{ or } 34\%$$

$$\text{Unsystematic risk } (l^2) = \text{Total risk} - \text{systematic risk}$$

$$= 0.0569 - 0.034$$

$$= 0.0229$$

$$\text{Proportion of systematic risk } (\rho^2) = \frac{\beta^2 \sigma_m^2}{\text{var}(\sigma^2)}$$

$$= \frac{0.034}{0.0569}$$

$$= 0.5975$$

$$\text{Proportion of unsystematic risk } (1 - \rho^2) = 1 - 0.5975$$

$$= 1 - 0.5975$$

$$= 0.4025$$

$$\text{Proportion of unsystematic risk } (1 - \rho^2) = \frac{0.0229}{0.0569} = 0.4025$$

$$\text{Correlation coefficient}(r) = \frac{\text{Cor}(R_j, R_m)}{\sigma_j \sigma_m}$$

$$= \frac{0.0899}{0.2387 \times 0.4874}$$

$$= 0.7727$$

$$\text{Alpha } (\alpha) = E(R) - E(R_m) \times \beta$$

$$= 0.3939 - 0.2844 \times 0.0899$$

$$= 0.3682$$

Appendix IV(B)
Calculation of coefficient Beta of common stock of EBL and market

Fiscal year	[R-E(R)]	[Rm-E(Rm)]	[R-E(R)] [Rm-E(Rm)]
2004 / 05	0.05	0.1157	0.0058
2005 / 06	0.39	0.065	0.0254
2006 / 07	0.43	0.4837	0.2079
2007 / 08	0.05	0.1567	0.5078
2008 / 09	-0.56	-0.8208	0.4596

Source: Table No. 4.11 and 4.18

We have,

$$Cor(R_j R_m) = \frac{\sum [R_m - E(R)] [R - E(R_m)]}{n-1}$$

$$= \frac{0.7065}{5-1} = 0.1766$$

$$\beta_j = \frac{cor(R_j R_m)}{\sigma^{2m}}$$

$$= \frac{0.1766}{0.2374} = 0.7439$$

$$\text{Systematic risk} = \beta^2 \sigma^{2m} = (0.7439)^2 \times 0.2374$$

$$= 0.1314$$

$$\text{Unsystematic risk } (l^2) = \text{Total risk} - \text{systematic risk}$$

$$= (\sigma)^2 - \beta^2 \sigma^{2m}$$

$$= 0.1639 - 0.1314$$

$$= 0.0325$$

$$\text{Proportion of systematic risk } (\rho^2) = \frac{\beta^2 \sigma^{2m}}{(\sigma^2)}$$

$$= \frac{0.1314}{0.01639} = 0.8017$$

$$\text{Proportion of unsystematic risk } (1 - \rho^2) = 1 - 0.8017$$

$$= 0.1983 \text{ or}$$

$$\text{Proportion of unsystematic risk } (1 - \rho^2) = \frac{l^2}{\sigma^2}$$

$$= \frac{0.0325}{0.1639} = 0.1983$$

$$\text{Correlation coefficient}(r) = \frac{cor(R, R_m)}{\sigma_j \sigma_m}$$

$$= \frac{0.1766}{0.4048 \times 0.4874}$$

$$= 0.9508$$

$$\text{Alpha } (\alpha) = E(R) - E(R_m) \times \beta$$

$$= 0.36 - 0.2844 \times 0.1766$$

$$= 0.31$$

Appendix V(B)
Calculation of coefficient Beta of common stock of BOK and market

Fiscal year	[R-E(R)]	[Rm-E(Rm)]	[R-E(R)] [Rm-E(Rm)]
2004 / 05	-0.026	0.1157	-0.0030
2005 / 06	0.4855	0.065	0.03155
2006 / 07	0.1067	0.4837	0.0516
2007 / 08	0.2037	0.1567	0.0319
2008 / 09	-0.7697	-0.8208	0.6318

Source: Table No. 4.14 and 4.18

We have,

$$\begin{aligned} \text{Cor}(R_j R_m) &= \frac{[R-E(R)] [R-E(R_m)]}{n-1} \\ &= \frac{0.7038}{5-1} = 0.18595 \\ \beta_j &= \frac{\text{cor}(R_j R_m)}{\sigma^2 m} \\ &= \frac{0.18595}{0.2374} \\ &= 0.7833 \end{aligned}$$

$$\begin{aligned} \text{Systematic risk} &= \beta^2 \sigma^2 m = (0.733)^2 \times 0.2374 \\ &= 0.1456 \end{aligned}$$

$$\begin{aligned} \text{Unsystematic risk } (l^2) &= \text{Total risk} - \text{systematic risk} \\ &= 0.22045 - 0.1456 \\ &= 0.07485 \end{aligned}$$

$$\begin{aligned} \text{Proportion of systematic risk } (\rho^2) &= \frac{\beta^2 \sigma^2 m}{(\sigma^2)} \\ &= \frac{0.1456}{0.22045} \\ &= 0.6605 \end{aligned}$$

$$\begin{aligned} \text{Proportion of unsystematic risk } (1 - \rho^2) &= \frac{l^2}{\text{var}(\sigma^2)} \\ &= \frac{0.07485}{0.22045} \\ &= 0.3395 \end{aligned}$$

$$\begin{aligned} \text{Correlation coefficient}(r) &= \frac{\text{cor}(R, R_m)}{\sigma_j \sigma_m} \\ &= \frac{0.118595}{0.4874 \times 0.4695} \\ &= 0.8127 \end{aligned}$$

$$\begin{aligned} \alpha \text{ Intercept} &= E(R) - E(R_m) \times \beta \\ &= 0.5345 - 0.2844 \times 0.4833 \\ &= 0.5345 - 0.2227 \\ &= 0.3118 \text{ or } 31.18\% \end{aligned}$$

Appendix I(B)

Calculation of Beta Coefficient of the common stock of NABIL and Market

Fiscal Year	$[R-E(R)]$	$[R_m-E(R_m)]$	$[R_j-E(r_s)] [R_m-E(R_m)]$