"A Study on Risk and Return Analysis in context to Commercial Banks in Nepal"

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By:

Nirmala Parajuli

Post Graduate Campus
Biratnagar
T.U. Registration No. : 7-1-350-21-97

A Thesis Submitted to:

Office of Dean
Faculty of Management
Tribhuvan University

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In partial fulfillment of the requirement of the Master's Degree in Business Studies (M.B.S.)

Biratnagar, Nepal
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RECOMMENDATION

This is to certify that the thesis

Submitted by:

Nirmala Parajuli

Entitled

"A Study on Risk and Return Analysis in context to Commercial Banks in Nepal"

has been prepared by this department in the prescribed format of Faculty of Management, Tribhuvan Unviersity. This thesis is forwarded for examination.

Supervisor	**Head of Department**
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Date : ....…………

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VIVA-VOCE SHEET

We have conducted the viva-voce examination of the thesis presented by

Nirmala Parajuli

entitled

"A Study on Risk and Return Analysis in context to Commercial Banks in Nepal"

and found the thesis to be the original work of the student and written according to the prescribed format. We recommend the thesis to be accepted as partial fulfillment of the requirement for

Master's Degree in Business Studies (M.B.S.)

<u>Viva-Voce Committee</u>

Chair Person, Research Committee ....

Member (Thesis Supervisor) ....
(Dr. Madhav Bahadur Shrestha)

Member (External Expert) ....

DECLARATION

I hereby declare that this thesis entitled "**A Study on Risk and Return in Context to Commercial Banks in Nepal**" submitted to Post Graduate Campus, Biratnagar, is my original research work as partial fulfillment of the requirement of Master's Degree in Business Studies (MBS).This research paper is completed under the continuous supervision and guidance of Dr. Madhav Bahadur Shrestha, Post Graduate Campus, Purano Hawai Field, Biratnagar.

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AKNOWLEDGEMENT

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ABBREVIATION

A.D.	=	Anno Domini
B.S.	=	Bikram Sambat
FY	=	Fiscal Year
C.V.	=	Coefficient of Variation
CAPM	=	Capital Assets Pricing Model
SML	=	Security Market Line
COV	=	Covariance
CS	=	Common Stock
D.F.	=	Degree of Freedom
i.e.	=	That Is
Ltd.	=	Limited
GDP	=	Gross Domestic Production
NABIL	=	Nabil Bank Ltd.
NIBL	=	Nepal Investment Bank Limited
SCBL	=	Standard Chartered Bank Limited
HBL	=	Himalayan Bank Limited
NBBL	=	Nepal Bangladesh Bank Limited
EBL	=	Everest Bank Limited
EIC	=	Everest Insurance Company
NLGIC	=	National Life and General Insurance Company
EPS	=	Earning Per Share
DPS	=	Dividend Per Share
MPS	=	Market Price Per Share
BPS	=	Book Value Per Share
ERR	=	Expected Rate of Return
SR	=	Systematic Risk
USR	=	Unsystematic Risk
NEPSE	=	Nepal Stock Exchange
SEBO	=	Security Board
T.U.	=	Tribhuvan University

CHAPTER - I

INTRODUCTION:

1.1 <u>BACKGROUND OF THE STUDY:</u>

"Nepal" a landlocked country, with India on Eastern, southern & western three boundaries and the northern boundary to China with high Himalayan is a poor and underdeveloped country. Deprived of the basic development indicators such as socio-economic, technology and all others factors, the country's economy and people capita income has been found significantly below the poverty line. According to the world development report 2003 the per capita income of Nepal is just 250us dollar. The country's basic and the only one economic factor is the agricultural(land-use, cash crops etc). It is the major source of livelihood for a majority of the county's population. About 80% of Nepal's population depends upon only on the agriculture. Its contribution to the GDP is 39%. Nepal government has given priority to the agriculture because there is less possibility of development in other sectors. So, since 5th economy development plan, Nepal government has given priority in agriculture but the expected change in this sector is still not achieved. Agricultural sector is not only for the development factor for the economic development of the country so the non-agricultural sector (i.e. various industries, financial institution, health and educational enterprises) should also be given higher priority. Nepal as an under developed country whose economy source is agriculture should be supported by establishment of non-agricultural sector. But establishment of such institution is not enough to economic development; they are smoothly and result oriented prioritized and implemented. But the overall achievements should address the financial aspects. Finance is art and science of managing money, which is concerned with the process, institution, markets and instructions involved in the transfer of money among and between individuals business and government. The proper decisions made by top management related to the

management of funds, determines the future of the organization. Investment decision, financing decision and assets management decisions are the top management decision which is related to finance. Top management decisions are related to finance based on financial analysis. It covers the acquisition, utilization, control and administration of fund. The financial manager plays a key role in the operation of the firm.

"Managerial, finance is important in all types of business whether they are public or private, deal with financial services or are manufacturers. The types of jobs one encounter in managerial finance range from decision regarding plant expansions to choosing what types of securities to issue to finance expansion."*(Weston J. Fred and Brigham Fugene,1996:5).*

In this time, the field of finance is wide and dynamic. Different types of tools for acquisition of fund and effective utilization have been developed. Finance has become an important branch of any economy of which share market is a leading sectors. In the short period, the field of finances has developed considerably. Securities raise funds in capital market that certainly help to expand the national economy.

"To maximize the share price, the financial manager must learn to assess two key determinants, risk and return always. Each financial decision present certain risk and return characteristics and the unique combination of characteristics has an impact on share price."*(Gitman, 2001:236)* The study is concerned with risk and return associated with common stock in vestment however there are various types of financial assets to be invest i.e. treasure bill, long term bonds, preferred stock, etc.

Return is the reward received from investment for waiting and compensation for risk bearing. Return is the major factor behind any investment but it involves risk. It can be said that Risk and Return are play the key role in investment. Researches have shown that most of investors are risk averter so it can be concluded that people invest their

belongings in those opportunities where they can get higher return with bearing low level of risk.

Risk is typically defined as uncertainty. It arises from imperfect knowledge or from incomplete data. "Risk plays a central role in the analysis of investment. Risk is the facts of life, which is a product of uncertainty and its magnitude depends upon the degree of variability in uncertain cash flows. Risk is fact is an indication of chance of losing investment value. Different people interpret risk in different ways. To, some it is simply a lack of definite outcome, which can be any unknown event, which may be unfavorable. It is a chance of happening some unfavorable event or danger of losing some material value. Risk can be thought of as the possibility that actual return from holding security will deviate from unexpected return." *(Pandey, 1997:878)*

The concept of risk and return are the determinant for the valuation of securities. However risk means that we do not know what is going to happen even through we occasionally have a good idea of the range of possibilities that we face. In the most basic sense risk can be defined as the change of loss. Assets having greater changes of loss are viewed as more risky them those with lesser changes of loss. More formally, the term risk is used interchange ably with uncertainty to refer to the variability of returns associated with a given asset."*(Gitman, 2001:237)*

Out of the various types of the securities this study deals with common stock investment. It is a risky investment than both bonds and preferred stock but it has also benefit like voting right in participation in profit. And also common stock may be purchased and sold immediately. There is the uncertainty of future return whose main source is the price fluctuation of the common stock. The stock price may be decreased due to the economic factor such as inflation, interest rates, strength of dollar, economic growth of the nation etc. The stock price is also affected by political and legal environment of the nation. The dividend received by the investor directly contributes to the return received by the investors but at the same time

reduces the amount of earning reinvested by the firm resulting limited potential growth. So, mainly the risk of a stock investment can be measured by its price volatility and degree of uncertainty of dividend fluctuation.

As already mentioned that most of the investors are risk averse. Investors must seek to identify the stocks "having low risk which results high returns". A rational investor wants to maximize his/her return at minimum risk. Even the Investors can't be increased the return substainlly they can reduce the risk by diversification of investment in different securities making a portfolio. Making a portfolio of common stock an investor can't eliminate all the risk. Risk is of two types, i.e. systematic risk and unsystematic risk. Unsystematic risk can be eliminated by diversify. Business risk, financial risk is the component of unsystematic risk. But the systematic risk can't be avoided through portfolio of stock.

An investment is the commitment of funds made in the expectation of some positive rate of return. If the investment is properly undertaken, the return will be commensurate with the risk the investor assumes. So any investors want to invest their money in those securities which provide higher expected return having or bearing low level of risk. In the investment of common stock an investor agrees to pay the price for stock in the anticipation of future dividend and growth in stock price. But various financial and non-financial factors play a great role in the price determination even in the imperfect market.

The financial market permits both business and government to raise the needed funds by selling securities simultaneously, investors with excess funds are able to invest and earned in return enhancing their wel-fare. The capital market is the part of financial market which is related to long term debt and corporate stocks. In capital market the financial assets (securities) such as stocks and bonds can be purchased or sold. One party transfer funds in financial markets by purchasing financial assets previously held by another party. Financial markets facilitate financing

and investing by households, firms and government agencies. The main objective of the market is to create opportunity for maximum number of people to get benefit from the return obtained by directing the economy towards the productive sector by mobilizing the long term capital .The objective can be fulfilled only by the stock market providing various opportunities in investing various stocks of companies.

In general, banks mean an institution that accepts deposits in different account and provides loans of different types. Many changes have taken place in the functions of a bank from the initial stages of its development to present day. The modern complex economic system can not function without bank. When a performs multiple tasks, the efficiency and effectiveness of work become weak. Hence different banks are established with different purpose and in different categories. Among them this study primly focuses on commercial banks.

The commercial bank is the oldest form of bank. There are various changes in the original concept and functions of commercial bank. "Commercial bank exchange money, deposit grants loans and performs other commercial bank function and is not a bank meant for corporative agriculture industrial as per specific function."*(Commercial bank Act, 2031:5)* Commercial banks are established as a joint stock company with a view to earn profit. Thus, banks are regarded as the heart of modern economy.

Securities board, Nepal (SEBO) was established on 26 may,1993, under the provision of the securities exchange act, 1983 with the objective of promoting and protecting the interest of investors by regulating the security market. Beside the regulatory role, it is also responsible for the development of securities market in the country." Securities exchange act has empowered Nepal stock exchange (NEPSE) with the capacity of promulgating various byelaws in order to ensure orderly and fair transactions of securities. According securities listing byelaws, 1996, and membership of stock exchange and transactions byelaws, 1998 *(securities*

board, 2001:15). Formally stock market development started only after the establishment of securities exchange center in 1984, which was later renamed as Nepal stock exchange (NEPSE) Ltd. In1990 and it brought new dimensions and atmosphere in stock market*(Manandhar.:15-20).* Now a days, the number of companies have been established and listed their shares in NEPSE Ltd. NEPSE Ltd. has, as a secondary market provided its trading floor where buying and selling practices of stocks take place with the help of open-out-cry system. The secondary market provides adequate trade off between risk return for investors and also for financial institutions to purchase and sell according to needs and given strategic aims *(shrestha, M.K., 1998:10).*

In Nepal, organized banking system is a relatively recent phenomenon. The process was started establishment of Nepal bank ltd on 30th kartik 1994(BS) as the first commercial bank of the nation. That time also the banking sector wasn't in growth and progress. Nepal Rastra bank was established on 14th Baishakh 2013(BS) as the central bank of Nepal which was going on 30 years without any competitors. Rastriya Banijya bank was established on 2022(BS) as the second commercial bank in order to play a major role not only domestic but also in foreign trade.

With the initiation of economic liberalization in the country, entry restriction on banking business was lifted. So, the number of private and joint venture bank have been established such as Nepal Arab Bank Ltd (2041), Standard Chartered Bank Ltd (2043), Himalayan Bank Ltd (2049), Nepal SBI Bank ltd (2050), Nepal Bangaladesh Bank Ltd (2051),Everest Bank Ltd (2051), Siddhartha Bank Ltd (2058), Globle Bank Ltd (2063) and many more.

1.2 <u>FOCUS OF THE STUDY :</u>

The study has been mainly focused about the commercial banks on behalf of the "risk and return analysis" for common stock issues. Risk and Return relationship is an important and vague issue among Investor and analyst.

"Common stocks are securities that represent the ultimate ownership (and risk) position in a corporation."*(Van Horne,J.C. and Wachowiez,2001:75)*

Common stockholders of a company are its ultimate owners and collectively they own the company assuming that ultimate risk is associated with ownership. Hence, analyzing and minimizing the risk associated with the ownership can be address through market return ,expected return, total risk, systematic risk and unsystematic risk to give an ideas for sustainable profit . Banking sectors in Nepal has increased significantly within a short period comparatively. They play a vital role in the country's all-round development. Economic development in a limited and insufficient banking and financial activities is a major constraint. Therefore, commercial bank addressed and mobilized the finance (fund) for a better output and profit making target.

1.3 STATEMENT OF THE PROBLEM :

The major problem in almost all the under developed countries is the formulation of capital and its proper utilization; this directly affect the economic development of the country. To avoid this problem and contribute to welfare of national economy. Various commercials banks have established. The main role of these commercials banks is to act as the bridge between the savers and users. They collect scattered deposits and give various types of loans to maximize their wealth. But because of unfavorable present situation, these banks are being compelled to reduce in the interest rate offered to depositors in order to minimize the collection of deposit. In this situation, Nepalese banks were suffering from various problems like lower per capita income, high population growth rate, lack of inadequate infrastructure, lower economic growth rate, lower employment opportunity and high unemployment in agriculture sector.

 It is true that after the establishment of Nepal stock exchange, the capital market has grown rapidly with in a very short period, however the attitude, thought and knowledge of the must investors is not change. Risk and return is the new concept in Nepalese financial market and the investors have also little knowledge in risk and return management due to

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lack of adequate information as well as present unstable political and economic condition the stock price volatility rate is high. Because of that the investors are losing their confidence towards NEPSE and hesitate to invest in common stock do not made investment activities rational.

At this time, there in no any separate institution, which provide information required to rational decision that can accelerate the stock investment and market efficiency. Government policy is less encouraging in promoting common stock investment. Therefore, courage is needed and at the same time faith to invest in common stock because there are several question which may have arising in the mind of the individual investors at the time of investment.

To sum of this study deals with the following issues ;

- How Much return is provided by the commercial bank to their common stockholder ?

- What kind of relation does exist with risk and return ?

- How can investor diversify the risk ?

- What is effect of portfolio on return ?

- What should be the compensation for the bearing risk ?

- What are the sources of risk ?

- What kind of risk exists on the stock investment of Nepalese commercial banks ?

1.4 <u>OBJECTIVE OF THE STUDY :</u>

The key objective of this study is to examine the situation to securities market of Nepal and to evaluate the risk associated with return on common stock investment of the selected Nepalese commercial banks.

The specific objectives of this study are as follows:

- To analyze the risk and return associated with the common stock of commercial banks.

- To understand and identify the problem faced by individual investor and commercial Banks.

- To analyze the risk and return of different portfolio.

- To analyze the covariance and correlation between the return of common stocks of commercial banks.

- To analyze and recommend the 'Risk and Return Analysis' within and between commercial Banks.

- To provide suggestions, some practical ideas and recommendations for improvement.

1.5 SIGNIFICANCE OF THE STUDY :

Every research work or study should be fruitful. This study will give correct information about Nepalese stock market by analyzing risk and return and will definitely contribute to increase the analytical power of the investor in stock market. In Nepalese context, very few studies are made and there are no specific magazines and articles on the topic. So, the study will be more significant for exploring and increasing stock investment.

The main significant of this study are ;

- This study will be beneficial for the entire person who is directly related to the Nepalese stock market.

- The study is matter of crying needs to identify the possible return with responsible risk.

- The study will prove beneficial to the present investors to analyze and revise their action.

- This study helps to identify risk and return trade off of their investment.

- This study will be helpful in taking right decision.

- The study will be significant academicians, students and investors by providing different

- Guideline, suggestion and recommendations.

1.6 <u>LIMITATION OF THE STUDY:</u>

Every research naturally has some limitation. Mainly this study is made for the partial fulfillment of MBS level .So there are couples of limitations which weaken the generatization. The main limitations are inadequate coverage of industries, time taken, reliability of statistical tools used and other variables, which are not included in the study .The major limitations are as follows :-

- Only six commercial banks are taken from NEPSE as a sample to draw conclusion.

- This study has been done covering the latest five years data only.

- This study is only concerned the risk and return of the selected commercial banks.

- The study is mainly based on secondary data which was taken from the   NEPSE of selected companies, other related journal, previous thesis, magazines, books etc.

- The reliability of conclusion of this study is based upon the accuracy of secondary data.

- Time and resource are also major limitation of the study.

1.7 ORGANIZATION OF THE STUDY:

The whole study has been divided into five chapters.

Chapter One (1) : Introduction ;

It includes the introduction and general background, focus of the study, statement of the problem, objective of the study, significance of the study, limitation of the study and organization of the study etc.

Chapter Two (2) : Review of the literature;

The second chapter deals with review of available literature which includes conceptual/theoretical review and review of related studies.

Chapter Three (3) : Research Methodology ;

The third chapter explains the research methodology used in the study which various tools and techniques of data, sources of data, population and sample, research design, method of data analysis etc.

Chapter Four (4) : Presentation and Data analysis;

The four chapter is the main body of the research. It includes data presentation, interpretation and analysis and finding of the study. In this chapter, the risk and return of the result of each selected companies is analyzed. The result obtained is compared with industries and market too.

Chapter Five (5): Summary, Conclusion and Recommendation ;

This is the last chapter of the study which includes the summary, conclusion and recommendation of the research. And finally suggestion of the recommendation is given for improving the future performance of the selected commercial banks.

At the end

Bibliography and Appendix are included in this research paper.

CHAPTER II

LITERATURE REVIEW

Review of literature means reviewing research studies or other relevant proposition in the related areas of study so that all past studies, their conclusions and deficiencies may be known and further research can be conducted. It is an integral and mandatory process in research work.

In this chapter, the summary of major finding from reviewing the books, journals, magazines etc. related to the field of the study are presented. Research is a continuous process the procedures of findings may change due to continuous research. To get the ability of analysis and interpretation of data. A researcher must review then literature about his/her field study. So, the books and previous studies related to this field study might provide the foundation for the study. This continuity in research is ensured by linking the present study with the past research studies.

In this chapter relevant and recent literature, which are related to the topic "Risk and Return" is reviewed. Various books, journals and articles, thesis of seniors, some research reports related with the topic have been reviewed in this chapter.

## 2.	CONCEPTUAL FRAMEWORK :

Various books deals with theoretical aspects of risk and return are taken into consideration. Major focus is given to the implication of Risk and Return trade off in the investment on common stocks. The Capital Assets Pricing Model is also deal to some extent. It gives the theoretical framework to analyze the study.

2.1 INVESTMENT, RISK AND RETURN :

Analysis of risk and return shows the relationship between risk and return on any kind of investment. Investment mean sacrificing current earnings form future return or reward bearing certain risk. Investment can be made on real assets or financial assets. Investment on real assets is called real investment and on financial assets is called financial investment. In primitive economics most investment was on real asset, whereas in modern economy most investment is of financial variety.

"Investment in the broadest sense means the sacrifice of current dollars for further dollars. Two different attributes are generally involved time and risk. The sacrifice takes place in the present and is certain. The rewards come later at future and magnitude is generally uncertain."*(Sharpe, 1995:1)* A wide range of investment opportunity is available to individual investors. Investment can be made on common stock, preferred stock, bond, convertible, warrants and option etc. among various alternatives the present study focuses on common stock investment only.

Risk is the possibility of meeting danger or suffering harm or loss. Risk is term of investment is unexpected outcome, which are harmful for investors. Risk can also be defined as the chance that some unfavorable event will occur.

Return is reward received from investment for sacrifice of present certain amount of assets. It is commonly defined as reward for bearing risk. Investors invest their funds in long term securities for the future return for long run. So, return is the most important outcome from and investment. It measures the investor's rate of wealth accumulation i.e. increase or decrease in the wealth of the investor.

2.2 COMMON STOCK :

The research study is focused on the investment, risk and return on common stock so the discussion about common stock has made here.

"Common stock represents an ownership position in a co-operation. It is a residual claim, in the sense that creditors and preference shareholders must be paid as scheduled before common stock holders can receive any payment. In bankruptcy common stockholders are in the principal entitled only to assets remaining after all prior claimants have been satisfied. Thus risk is highest with common stock and so must be in this expected return. When investors buy a common stock, they receive certificate of ownership as a proof of being a part of owners of the company. The certificate status the numbers of shares purchased and their par value." *(Bhalla, 2000:196)*

Common stock represents ownership position in a corporation. It is a residual claim, in the sense that creditors and preference shareholders must be paid out before common stock holders can receive any payment. As a result, stockholder's return on the investment is less certain than the return to lender or to a preferred stock holder. Hence risk is highest in common stock so is the return. The potential reward and penalties associated with common stock makes it both romantic and exciting proposal. Common stock holder may loose their initial investment and nothing more in case of liquidation of the organization. Equity or common stock is usually known as risk bearing shares; it does not receive any dividend during the early stage. During liquidation they are paid out but they are also entitled to all surplus assets after payment to creditors and preference shareholders.

"Of all the form of securities common stock appears to be the most romantic. Which fixed income investment revenue may be more

important to the most investors. Common stock seen to capture their interest the most. The potential reward and penalties associated with common stock make them an interesting even exciting proposition, no wonder common stock investment is favorite topic for conversation in parties and get together. *(Prasanna, 1995:93)*

2.2.1 RETURN ON COMMON STOCK :

Return is the benefit or income received on investment. Return is the motivational factors, encourages investors to scarifies some certain amount of assets for uncertain benefit in future. "The return from an investment is the realizable cash flow earned by its owner during a given period of time. Typically it is expressed as percentage of beginning of period value of the investment."*(Prasanna, 1995:62)*

The return on common stock can be defined as the dividend yield plus the capital gain or loss. If an investor purchases a stock of any company and held it for certain period, he/she can get return in two ways- one is increase in the value of that stock as compared to initial one and another is direct cash payment. The increase in the value is capital appreciation and direct cash payment is divided income. So, the one period return on common stock is given by :-

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

Where,

R   =   Actual (Expected) Return.

P_t =   Stock's price at "t" time.

P_{t-1} =   Stock's price at "t-1" time.

D_t =   Cash dividend at the end of "t" time.

This formula can be used to determine both actual one period return (base on historical date) and expected one period return (based on expected dividend and price).

The analyzed rate of return over several periods can be calculated in two ways. The first is simply to take arithmetic average of the annual holding period returns and the second is the geometric mean which also takes in the account the compound effect of cash receipts.

The arithmetic mean holding period return,

$$E(HPR) = \frac{\sum_{t=1}^{n} HPR_t}{n}$$

The geometric mean return,

$$E(HPRg) = \prod_{t=1}^{n} [1 + HPR_t]^{\frac{1}{n}} - 1$$

Where,

HPR= Holding period return

$\sum$ = Sing of summation or total

$\prod$ = Sing of product or multiplication

n = Number of periods

t = Time period 1,2,3 ……. N

Expected Rate of Return:

Most of the investment decisions are made for futures event. Hence, it is necessary to predict the future returns that the past return. But future is always uncertain for the common stock folders. Therefore it leads to find the expected rate of return. The expected rate of return can be estimated by analyzing the trend of return of previous period and by using probability distribution of returns. The ex-post returns can be averaged for calculating the future expected return and a probability distribution could be used to forecast the future rate of return.

Using probability distribution

$$\text{Expected Return E(R)} = \frac{\sum_{t=1}^{n} HPR_t}{n}$$

Using Ex-post Return,

$$\text{Expected Return E(R)} = \sum_{t=1}^{n} r_i p_i$$

Where,

r_i = The return for the ith possibility

P_i = The probability of that returns occurring/accruing.

n   =   No. of possibilities.

2.2.2 Risk on Common Stock:

Risk is the uncertainty associated with the end of period value of an investment. Risk and return are the determinants for the valuation of the securities. However, risk means that we do not know what is going to happen even though we occasionally have a good idea of the range of possibilities. Risk is a hazard, a peril and exposure to loss or injury. Thus most risk refers to the chance that some unfavorable event may occur. While other view it as a chance of loss. But in reality, particular activity or event may be cause of risk. Risk is the product of all potential outcomes expressed with probability associated with each other and it is distribution of such outcomes. Investment on common stock is a risky investment. So, the uncertainties of risk on common stock are the facts of life to the common stock holders. Uncertainty and risk are treated separately in financial analysis. Risk is the unlooked and unwanted event in the future. Someone has said that risk was the sugar and salt of life.

"Instead of measuring risk the probability of a no. of different possible outcomes, the measure of risk should some how estimates the extent to which the actual outcome is likely to diverge from the expected outcome. Standard deviation is a measure that does this because it is an estimate of the likely divergence of actual return from an expected return. *(Sharpe, Alexander and Bailey, 1995 :151)*

We can measure risk by examining the tightness of the probability distribution associated with the possible outcomes. It is widely used to measure risk from holding a single assets. Greater the standard deviation represents a high dispersion of return and is a greater the risk. On other hand a smaller standard deviation represents a low dispersion of return and is a smaller the risk. The risk or standard deviation is denoted by σ which is given

$$\sigma = \sqrt{\frac{\sum_{t=n}^{n}[r - E(r)]^2}{n-1}}$$

where,

σ   =   standard deviation

r_i =   return for jth possibility

E(r)   =   Expected rate of return

n   =   No. of years

Financial analysis and statisticians prefer to use a quantitative risk surrogate called the variance of returns denoted var(r). The variance of an assets rate of return equals the sum of the 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.

$$Var(r) = \frac{\sum_{t=n}^{n}[r_1 - E(r)]^2}{n-1}$$

The other useful measure of risk is the coefficient of variation. It is the standard deviation divided by the expected return which measures risk per unit of return. "A standard deviation can something be misleading in comparing the risk or uncertainty surrounding alternatives of they differ in size. To adjust for the size or scale, problem, the standard deviation can be divided by the expected return to compute the coefficient of variation (C.V.).

Coefficient of variation (C.V.) = $\dfrac{\sigma}{E(r)} \times 100\%$

The coefficient of variation is a measure of risk per unit of expected return. The larger the C.V., the larger the negative risk of the investment."*(Van Horn & wachowich, 1995:97)*

2.3 Relationship Between Risk and Return:

In general it is known that there is a positive relationship between risk and return. The relationship between risk and return is described by investors perception about risk and their demand for their compensation. Investors will invest in project only if it promises adequate risk premium for the level of risk involved. Therefore, it is the investor's required risk premium that establishes a link between risk and return. In a market dominated by rational investors, higher risk will be rewarded higher premium and the trade of between the two assumes a linear relationship between risk and risk premium as illustrated in the figure 2.1 below:

Figure No. 2.1

General Pattern of Risk and Return
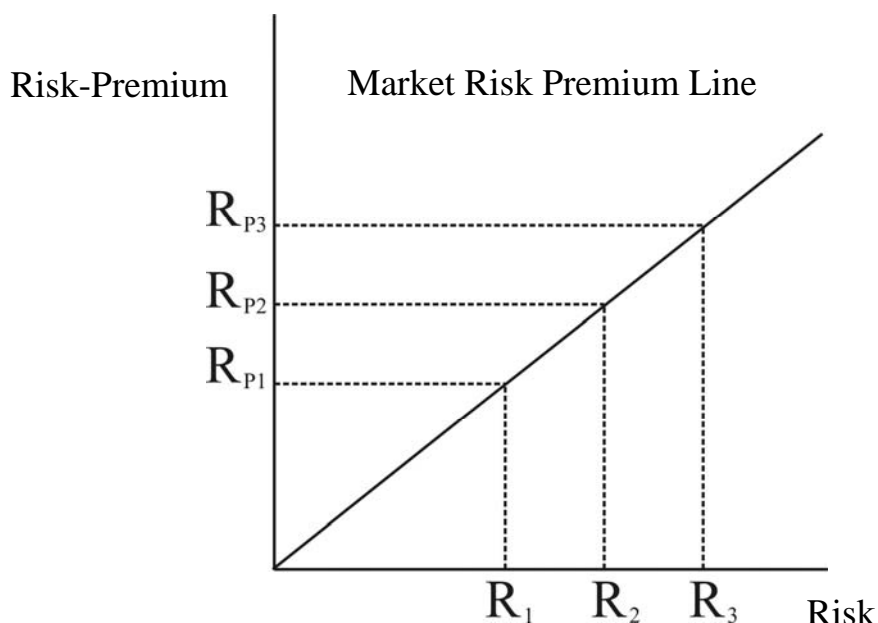
The figure represents a higher premium for higher risk in a linear fashion indicating a premium of Rp1 for r1 degree risk, Rp2 for r2 and so on. Under the assumption of linear relationship, the risk premium increases or decreases in proportion to change in the level of risk."(*Pradhan, 2000:325 - 326)*

The excepted return from any investment proposal will be linked to a fundamental relationship to the degree of risk in the proposal. In order to be acceptable a higher risk proposal must offer a higher forecasted return then lower risk proposal. He tries to show the relationship with the help of figure 2.1. The figure represents, if the level of risk increases the return will also increase. Here, it is seen that the value of the expected return is increase for level of R_{p1} to R_{p2} as a result the level of risk also increased from level $\sigma 1$ to $\sigma 2$. similarly, it is increases from the level Rp2 to Rp3 consequently the level of risk will also increase from $\sigma 2$ to $\sigma 3$ and vice-versa.*(Hampton,1986:397)*

As with any model, there are assumptions to be made, this model has also some assumptions. Shrpe et al have described the following assumption behind CAPM are as fallows *(Sharpe et al, 2005:228)*

- Investors evaluate portfolios by looking at the expected returns and standard deviation of the portfolio over a one period horizon.

- Investors are never satiated, so when given a choice between two portfolios with the higher expected returns.

- Investors are risk averse, so when given a choice between two portfolios with identical expected returns, they will choose the one with the lower standard deviation.

- Individual assets are infinitely divisible, meaning that an investor can buy a fraction of a share if he or she so desires.

- There is a risk free rate at which an investor may either lend or borrow money.

- Taxes and transaction costs are irrelevant.

  To those assumptions the following onces are added

- All investors have the same one period horizon.

- The risk free rate is the same for all investors.

- Information is freely and instantly available to all investors.

- Investors have homogeneous expectations, meaning that they have the same perception in regard to the expected returns, standard deviation and co-variance of securities.

By considering the above assumptions the writer have further described that in the world of CAPM, it is a simple matter to determine the relationship between risk and return for efficient portfolios. Figure 2.2 portrays it graphically.

Figure No. 2.2

The Capital Market Line
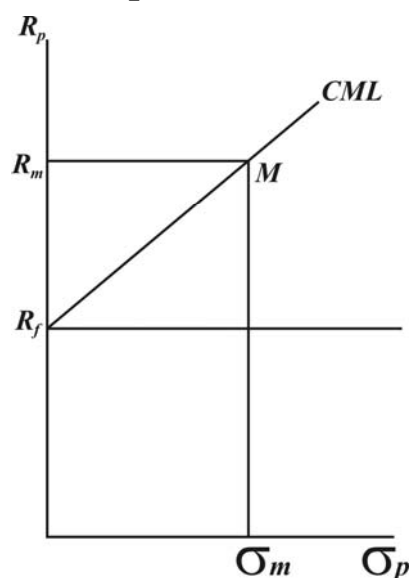
Point M represents the market portfolio and R_f represents the risk free rate of return. Efficient portfolio plot along the line starting at R_f and going through M and consists of alternative combination of risk and return obtainable by combining the market with risk-free borrowing or lending. This linear efficient set of the all portfolios other than those employing the portfolio and risk-free borrowing or lending would lie below the CML, although some plot are very close to it. The slope of the CML is equal to the difference between the expected return of the market portfolio and that of the risk free security $\left(\overline{r_p} - r_f\right)$ divided by the difference in their risk $(\sigma_m - 0)$ or $\left(\overline{r_p} - r_f\right)/\sigma_m$. Because the vertical intercept of the CML is r_f, the straight line characterizing the CML, has the following eqution:

$$\overline{r_p} = \left[\frac{\overline{r_m} - r_f}{\sigma_m}\right]\sigma_p$$

Where, $\overline{r_p}$ and σ_p refer to the expected return and standard deviation of an efficient portfolio.

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

$$\overline{r} = r_f + \left[\frac{\overline{r_m} - r_f}{\sigma^2_m}\right]\sigma_{im}$$

Where,

r_i = Return from security

r_f = Risk free rate of return.

r_m = Market return.

σ^2_m = Market variance

σ_{im} = Cov. of security with market portfolio.

As can be seen in figure below and above equation represents straight line having vertical intercept of r_f and a slope of $\left[\dfrac{\overline{r_m} - r_f}{\sigma^2_m}\right]\sigma_{im}$. Because the slope is positive, the equation indicates that securities with larger co-variance with market (σ_{im}) will be priced so as to have larger expected return $\overline{r_i}$. This relationship between co-variance and expected return is known as security market line(SML).

Figure No. 2.3

Co-variance Version of SML
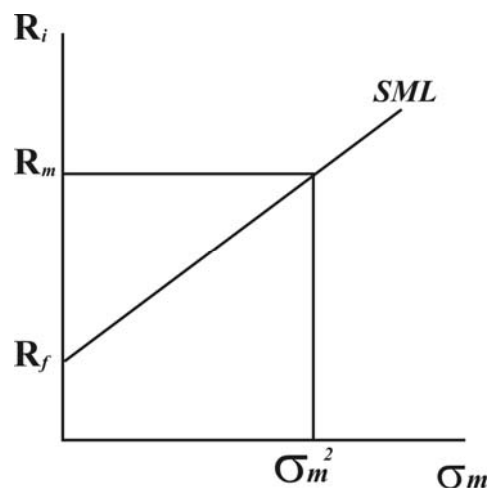
Figure No. 2.4

Beta Version of SML
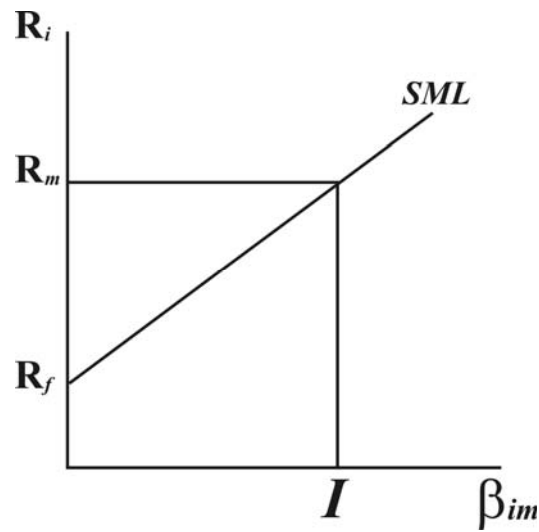
Another way of expression the SML is as follows.

$$\overline{r_i} = r_f + \left(\overline{r_m} - r_f\right)\beta_{im}$$

Where the term β_{im} is defined as:

$$\beta_{im} = \frac{\sigma_{im}}{\sigma^2{}_m}$$

The term of is β_{im} known as the beta co-efficient for security *i*, and is an alternative way of representing the co-variance of a security.*(Sharpe et al, 2005:231).*

The major implication of the model is that the expected return of an asset will be related to a measure of risk for the asset from as beta. The exact manner in which expected return and beta are related is specifies by CAPM.

Market risk is related to the risk of the market portfolio and to the beta of the security in equation. Securities with large beta will have larger amount of market risk. In the world of CAPM, securities with large beta will have larger expected return. These two relationship together imply that securities with larger market risk should have larger expected return. Non market risk is not related to beta. This means that there is no reason why securities with larger amounts of non market risk should have larger expected returns. Thus, according to CAPM investors are rewarded for bearing market risk but not for bearing non market risk.

2.4 PORTFOLIO ANALYSIS:

Portfolio is combination of two or more assets. Portfolio is the best way of investment for rational investors. The portfolio theory gives the concept of investment in a very good way that 'never keeps all the eggs in a single basket' i.e. entire amount should not be invested into a single asset.

"The objective of portfolio is to analyze different individual assets and delineate efficient portfolios. The group of efficient portfolios will be called the efficient set of portfolios; the efficient set of portfolios comprises the efficient frontier. The efficient frontier is the locus of points in risk-return space having maximum return at each risk class. The efficient frontier dominates all other investment." Portfolio theory developed by Professor Harry M. Markowitz in 1952 A.D. is based on the following assumption:-

- The expected return from an asset is the mean value of a probability distribution of future returns over some holding period.

- The risk on the individual assets or portfolio is based on the variability of returns. (i.e. S.D. or variance).

- Investors adhere to dominance principal i.e. for any given levels of risk investors prefer assets with higher expected return to assets with the lower expected return.

2.4.1 Return on Portfolio :

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

For the investment on two assets the formula is;

$$E(r_p) = W_i . E(R_i) + W_j E(R_j)$$

Where,

r_p =   Portfolio return.

W_i =   Weight on security i.

W_j =   Weight on security j.

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

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

"A portfolio weight can be either positive or negative. A positive weight means you are buying the security; we also refer to this as taking long position in the security. The opposite of taking a long position is taking a short position, or selling short. In this case, the portfolio weight is negative because the numerator is negative." *(R.A.Haugen, 1998:68)*

2.4.2 Risk on Portfolio :

Risk on portfolio is not a weighted average risk. Securities considered in a portfolio are associated with each other. Therefore, the portfolio risk also accounts for covariance between the returns of securities covariance is the product of the standard deviation of individual securities times their

correlation coefficient. The portfolio risk in the case of two-security portfolio can be computed as follows.

Portfolio risk is the risk of individual securities plus covariance between the securities. It is measured by standard deviation and calculating by using this formula:

$$\sigma_p = \sqrt{W_i^2.\sigma_i^2 + W_j^2.\sigma_j^2 + 2W_iW_j\ Cov(r_i,r_j)}$$

Where,

σ_p =   Portfolio standard deviation

W_i =   weight or proportion of fund investment in i[th] security

W_j =   weight or proportion of fund investment in j[th] security

σ_i^2 =   Variance of security i

σ_j^2 =   Variance of security j

cov (r_i, r_j) =   Covariance of stock I and j

The covariance of the possible returns of two securities in a measure of the extent which they are expected to vary together rather than independently of each other. The covariance in the above formula can be written as:-

Cov (r_i, r_j) = σ_i σ_j p_{ij}

Where,

P_{ij} =   The correlation coefficient between possible returns for security i & j

σ_i =   Standard deviation of security "i"

σ_j =   Standard deviation of security "j"

The correlation coefficient always lines in the range from -1.0 to +1.0. Positive correlation coefficient indicate that the return from two securities generally move in the same direction while negative correlation coefficient indicate that they generally move in opposite direction. A zero correlation coefficient indicate that the return from two securities an uncorrelated. The risk can be diversified if the correlation between securities is negative.

2.4.3   Markowitz Efficient Frontier :

Efficient Frontier is the combination of all possible called the attainable set of investment   opportunities. An investor will choose his/her optimal portfolio from the set of portfolio that Offer maximum expected return for varying level of risk and Offer minimum risk for varying level of expected return.

According to Markowitz, an investor should seek a portfolio of securities that lies on the efficient frontier set. "A portfolio is not efficient if there is another portfolio with a higher expected return and the same standard deviation. if your portfolio is not efficient you can increase the expected return without increasing the risk, decrease the risk without decreasing the expected return or some combination of increased expected return and decreasing the risk by switching to a portfolio on the efficient frontier."*(Van Horn, 1997:60)*

2.5   SYSTEMATIC RISK AND UNSYSTEMATIC RISK:

Any type of business, whether it is large or small, suffers risks because investment is a part of economics and the economical cycle changes frequently. When the market is bullish there is no risk and when starts declining i.e. bearish there may be high risk. The total risk associated with the investment can be classified as unsystematic risk and systematic risk.

Systematic risk is also known as non-diversifiable risk which is neither avoidable no can be quit. This risk arises due to the changes in the economic state or due to change made by government in fiscal or monitory policies that affect security overall or the investor who holds a well diversified portfolio will be exposed to this type of risk.

Unsystematic risk is also known as diversifiable or avoidable risk because an efficient portfolio is formed the unsystematic risk can totally be diversified. Such type of risk arises due to the many more reasons like labor strikes, management error, inventions, company not being to able to manage or obtain adequate raw materials on time, entry of strong competitor in the marker etc. this type of risk are normally minor and can be handled by the management.

The following figure show the relationship among diversification, unsystematic risk and systematic risk.

Figure No. 2.5

Total, Systematic and Unsystematic Risk
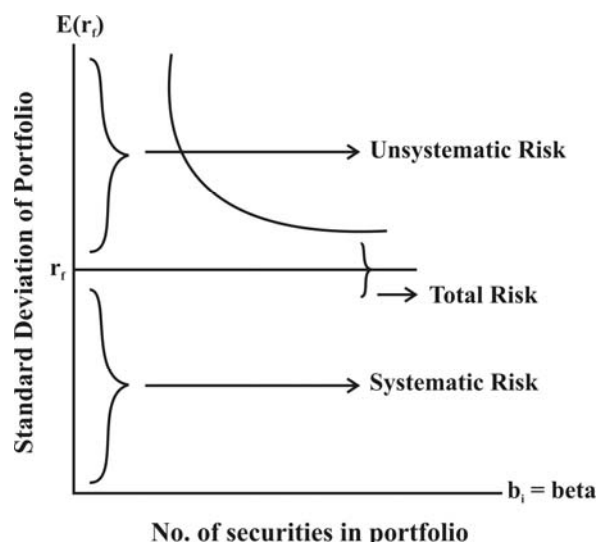
"As show in figure, unsystematic risk can be reduced as more and securities are added to a portfolio. In, USA it has been found that unsystematic risk can be eliminated by holding about fifteen securities and in India, it is forty." *(panday , 1997:340)*

Similarly, Franics has proposed that 'Total Risk' can be measured by the help of standard deviation(SD) or variance(var ri) which is square of SD.*(Franics,1992:254)*

Total risk (σi^2) = Systematic risk + Unsystematic risk

Where,

Systematic risk= var ($\beta_i.r_m$)

Unsystematic risk= var (e)

So,

(σi^2) =βi^2. Var (rm) + var (e)

2.6   REVIEW FROM RELATED STUDIES:

This topic is again sub-divided into three parts the review from journals, thesis and other independent (Nepalese) studies related to this topic "Risk & Return".

2.6.1 Review from journals:

The main focus of the study is the risk and associated returns of the common stock investment. So, for the purpose the journals of finance published in different dates may be reviewed here.

In context of Nepal , there are very few financial research based journals. They are very limited business magazines, which hardly publish in the topic related to 'risk and return'. So some foreign journals are taken into account to review the risk and return topics.

An article written by K. Greet Rouwenhorst entitled "Local Return Factors and Turnover in Emerging Stock Market's" which had been

published in 1999. This paper examines the sources of return variation in emerging stock markets. Compared to the developed markets the correlation between most emerging markets and stock markets has been historically low and until recently many emerging countries restricted investment by foreign investor. He attempts two sets of question to answer by his solution. Many emerging markets have firms with multiple classes of shares crying different ownership restrictions. Firms with multiple shares classes are treated as single value weighted portfolio of the outstanding equity securities. He concludes that the return factors in emerging markets are qualitatively similar to those in developed markets. The low correlation between the country return factors suggests that the premiums have a strong local character. Furthermore, global exposure can't explain the average factors returns of merging markets. There is little evidence that the correlation between the local factor portfolios have increased, which suggest that factors responsible for increase of emerging market country relation are separate from those that drive the differences between expected return within these market. A Bayesian analysis of premiums in developed and emerging market shows that, unless one has stronger prior beliefs to the country, the empirical evidence factors the hypothesis that size, momentum and values strategies are compensated for expected returns around the world. Finally the paper documents the relationship between expected return and share turnover examines the turn over characteristics of the local return factor portfolio. There is no evidence of a relation between expected return turnovers in emerging market. However, Beta, Size, momentum and value are positively cross sectionally correlated with turnover in emerging markets. This suggest that the returns premiums don't a simply reflects compensation for liquidity. *(Rouwesnhoust, 1999)*

An article written by Elton entitled "Expected Return, Realized Return and Asset Pricing Tests" which had been published in 1999 is also

relevant in this research. In this paper the writer has mentioned that "Almost all of the testing I am aware of involved using realized returns as proxy for expected returns relies on a belief the information surprises trend to cancel out over the period of over the period of a study and realized returns are therefore an unbiased estimate of expected returns. However, I believe that   here is ample evidence that is belief is misplaced. There are period longer than 10 years during which stock market realized returns are no average less than the risk free rate (1973 to 1984). There are periods longer than 50 years in which risky long-term bond on average under perform the risk free rate (1927 to 1981). Having a risky asset with an expected return above the risk-less rate is an extremely weak condition for realized returns to be an appropriate proxy for expected return and 10 and 50 is an awfully long time for such a weak condition not goes be satisfied. In the recent pass united states has had a stock market return of higher than 30 percent year while Asian markets have had negative return." *(Elton, 1999)*

2.6.2 Review from Nepalese Studies:

There are very few independent studies can be found here in the topic of finance in Nepalese context. But there are some independent studies about Nepalese stock markets are reviewed here;

The study carried out by Professor Manohar Krishan Shrestha in 1992 in the title of **"Shareholders Democracy and annual general Meeting (AGM) Feedback**". This study critically analyzed the situation of common stock investors. Shrestha has argued the need of separate act regarding the protection of shareholders right.

This study has been divided into two parts. The first part includes view on the rights of the shareholders regarding how they can exercise then in democratic perspective and the second part consist of feedback and the

issue raised by shareholders at different annual general meeting of public, limited companies and financial institution.

Company and another acts relating to financial and industrial sector have provisioned right of the shareholders are;

i.   Voting rights.

ii.   Participation in general meeting.

iii.   Right of getting information.

iv.   Electing as a board of director.

v.   Participation in the profit and loss of the company.

vi.   Transferring shares.

vii   Proxy representation.

The collective rights of the shareholders are;

i.   Amend the internal by laws.

ii.   Authorize the sales of laws.

iii.   Enter to merger.

iv.   Change amount of authorized capital.

There are many companies, which conduct the annual general meeting just to fulfill their desires and do not consider the voice of the majority of the shareholders. Similarly, managements involvement and government's intervention in the board election have brought a greater set back in the voting rights of the shareholders.

Similarly, another study carried out by Dr.Radhey Shyam Pradhan in 1993 in the title of '**Stock Market Behavior on Small Capital Market: A case study in Nepal**" Which are conducted more than five years ago

and published in the book of **'Research in Nepalese Finance'** in 2006. This study was based on data collected for seventeen enterprises from 1986 to 1990 whose stocks are listed in stock exchange center and traded in stock market. One of the major objectives, which are related to this study, was" To asses the stock market behavior in Nepal.

Mr. Pradhan has given the following finding.

- DPS and MPS is positively correlated.

- Higher the earning on stock, larger the ratio of dividend per share to MPS.

- There are positive relationship between dividend payout and liquidity.

Another independent study made by Atma Ram Ghimire entitled **"Nepal share market and investor's prospect"** published in the "Business Age" in June 2001 is reviewed here.

In this study he has pointed out some important trends to our capital market. He has mentioned in his article many unbalanced factors like potential in stability etc. are the main cause of decreasing share price. According to him current share price is on declining process. The fluctuation in NEPSE is due banking sector which price change has no logical explanation. Price change was due to availability of bonus, dividend etc. When we analyze our stock market we find that all the component of the market are lame, weak and perhaps work for vested interest. The general publics are also reckless in their investment and booker organization is also unqualified and is a one –man show. In addition to this board always favors companies and not the investors.

The conclusion of Mr. Atma Ram Ghimire is that the investors should be alert and aware to these situations. They must receive the financial information before making investment.

2.6.3 Reviews of Related Thesis:

There are some studies related to the topic "Risk and Return" has been reviewed for the fulfillment of Master's degree in T.U. which may be helpful for this study.

Mr. Ghimire has conducted the research entitled **'Portfolio Management of Nepalese Listed Companies'** in 2005 includes six commercial banks, four finance industry, four insurance industry and two manufacturing industry as a sample is reviewed here. His work is basically with portfolio management, which go some extent is also useful to present study.

The main objective of this study is to study the risk and return of securities(i.e. banking, finance, insurance and manufacturing section) and to find out the relationship between the rate of return of various securities and market return of these securities and to examine the usefulness of diversification effect to reduce the risk i.e. portfolio analysis. Similarly the some of his major findings are as fallows:

- It is possible to diversify the risk by making portfolio. The making of portfolio itself needs consideration between the stocks includes.

- The banking sector dominates the Nepalese stock market and investor's choice.

- The highest return offering stock is Nepal lever Ltd. Among all sixteen samples taken for his study. The highest risk expose stock is kathmandu finance Ltd. Among all sixteen samples.

- The Nepal share market Ltd has the highest coefficient of variation (i.e.2.49) among all samples.

- Nepal lever ltd. Has the highest beta and SBI bank ltd. Has lowest beta among all samples, it indicates that the common stock of Nepal lever ltd. Is most volatile and the common stock of Nepal SBI bank ltd. Is least volatile.

- Only two stock Nepal lever ltd and Nepal share market ltd. Fail to produce the expected return more than the require rate of return. Besides these two stocks, all other stocks are qualified from the view of SML equation.

Mr. Gautam has conducted the research entitled **'Analysis of Risk and Return on Common Stock Investment of Listed Insurance Companies'** in 2006 includes five insurance companies as a sample is reviewed here.

The main objective of this study is to determine the level of risk associated with common stock investment of listed insurance companies in Nepal and to analyze risk and return and other relevant that help in making decision about the stock and the investment. Similarly the some of his findings are as fallows:

- All insurance companies have positive expected return. Expected return of the common stock of EIC is the highest i.e.30.93% and NLGIC is lowest at 5.62% among all sample insurance companies.

- On the basis of sector wise comparison banking sector is the best as per highest expected return and higher degree of risk and from viewpoint of CV, insurance and finance sector is the best as it has least CV whereas as trading sector has minimum return and risk i.e. negative return.

- Overall market return is 9.9% risk on common stock of overall market (i.e.S.D.)is 35.4% and coefficient of variation of market is 3.58.

- The portfolio analysis indicates that forming portfolio can reduce the risk. By making portfolio it is found that their correlation coefficient is positively correlated.

- Since beta coefficient of all sample companies except NLGIC is greater than 1. it indicates that the share is more volatile than market except NLGIC.

- The CAPM analysis indicates that the stock of NLGIC is overpriced and other remaining company's stocks are under priced.

- In case of hypothesis testing the calculated value is less than the tabulated value so the null hypothesis is accepted. It means expected return of common stock of insurance company is equally to market return at all level of significance.

Kedar Prasad Tiwari has conducted a thesis entitled '**Risk and Return Analysis of Selected Finance Companies Listed in Nepal'** in 2007 includes six finance companies as a sample.

The main objective of the study is to analysis the risk and return associated with the common stock. For analyzing the data, he has used various statistical techniques of simple liner regression as well as other financial tools. Similarly the some of his findings are as fallows:

- There is positive relationship between expected return and different measure of risk of the finance company.

- The return of majority finance companies has higher degree of positive correlation with the return of other companies.

- All the investment involved certain amount of risk (i.e. Standard Deviation) as well as most of the finance company have the risk less than the average.

- All the finance companies have positive expected return as well as most of the finance company has the return near to the average.

- Some finance companies securities have highest value of CV is 3.49. although many of the finance companies CV is less than the average value of CV(1.77) but not in acceptable level.

- The overall effect of portfolio on risk and return shows mixed result. It means the portfolio helps to increase the return in some case but in some case it ahs also decreased the result up to negative level. But in other hand. Neatly in all case it has helped to decrease the level of risk up to some extent.

Mr.mangal Bhakta Shrestha has conducted a thesis on the topic **'Risk and Return Behaviour of listed commercial Banks in NEPSE'** in 2008 includes eight commercial banks as sample is reviewed here.

The main objective of the study is to examine the current status of stock market of Nepal and to analyze the risk and return associated with common stock of commercial banks. . Similarly the some of his findings are as fallows:

- The selected commercial banks having higher risk pose less rates of return and bank having low risk have higher return.

- The portfolio analysis provides empirical evidence of disparity between risk and return of selected commercial banks.

- Bank of Kathmandu Ltd has the higher value of beta is 2.25. Similarly it has the highest risk 67.61% and return is 22.04%.

- Most of the selected commercial banks have sensitive stock with market. Among 8 selected commercial banks, 5 of the banks have value of beta greater than one and 3 of them have value of beta is less than one.

- Risk and return of the selected commercial banks are not consistence. The average risk of selected commercial banks is 40.07% whereas return is only 9.23%. The highest risk is 67.61% of Bank of Kathmandu Ltd. whereas higher return is 23.49% of Nabil Bank Ltd.

- In comparison of overall market return of NEPSE and average return of selected commercial banks shown that there is no significantly difference.

- In case of hypothesis testing the calculated value is less than the tabulated value, the null hypothesis may be accepted. In other word, there is no significant different between average return of selected common stock and overall market return.

CHAPTER-III

RESEARCH METHODOLOGY

3.1 INTRODUCTION :

"Research methodology is a way to systematically solve the research problem."*(Kothari, 1999:1)* Research methodology may be defined as a systematic process applied in the entire aspect of the study. It refers to the overall research process, which a researcher conducts during his/her study. This chapter deals with the research methodology used in this section. In this chapter research design, population and sample, sources of data, data collection technique, data analysis tools are included. A research can be conducted on the basis of primary and secondary data. In this study all the data from secondary sources and the observed data is analyzed with using appropriate financial and statistical tools.

3.2 RESEARCH DESIGN :

Research design is the plan structure and strategy of investigation conceived so as to obtain answers to research questions and to control variance. Research design is the specification of method and procedure for the collection of data and it helps to collect the accurate information, which is related to risk and return on common stock investment of commercial banks of Nepal for this study.

This study based on historical data so, it is a historical research which covers the five years period data from the FY 2002/03 to 2006/07. It deals with the common stocks of commercial banks on the basis of available information. As the title of the study suggests, it is more analytical and empirical but less descriptive.

3.3   POPULATION AND SAMPLE:

This study is based on the commercial banks listed in the NEPSE index. There are 150 companies listed in the NEPSE index. But the study is concentrated in listed commercial banks only. There are 17 commercial banks listed in NEPSE which can be regarded as the size of population of this study. Because of various limitations, analysis of whole population is not possible. Thus, following commercial banks are selected as the sample for research purpose:

i.   NABIL Bank Ltd.

ii.   Nepal Investment bank Ltd.

iii.   Standard Chartered Bank Nepal Ltd.

iv.   Himalayan Bank Ltd.

v.   Nepal Bangaladesh Bank Ltd.

vi.   Everest Bank Ltd.

3.4   SOURCES OF DATA:

Data can be achieved through several means or sources. But, individual research project should be carried out in context to specific sources as per the research necessity. Mainly two sources classed as **Primary and Secondary** sources. The study is mainly based on the secondary data. In the age of computer technology, collection of data becomes easier. The secondary data have been acquired from various sources like :

- Annual reports of concerned commercial banks.

- Trading reports published by NEPSE.

- Materials published in paper and magazines related web site(i.e. www nepalstock.com)

- Other related books and booklets.

3.5 DATA ANALYSIS TOOLS:

Data are collected for analysis, research or any conclusive results. Data alone are not complete unless the data are related with activities to get some output/results. The data can be analyzed by using financial and statistical tools. A brief explanation of the terms and tools of analysis used in this study are as follows;

i)   **Market Price per Share of stock (MPS) :**

Market price per share is the major part of return. NEPSE index shows the three types of market price namely high, low and closing price. In place of average, we have taken clogging price of the stock at the end of year as market price because it is difficult to get all the required data accurately MPS.

ii)   Earning per share (EPS):

Net income of the company is a earning of that company. Earning per share is calculated by dividing net income by no. of common stock outstanding.

Mathematically,

$$EPS = \frac{Net\ Income}{No.\ of\ common\ stock\ outstanding}$$

iii)   **Dividend per share (DPS) :**

Dividend is the reward for waiting to the investor which is distributed to the shareholder. Dividend is two types i.e. cash dividend and stock dividend. If only cash dividend is paid there will be no problem but if stock dividend is also paid there will be problem in calculation of total gain to the shareholders. In this case, they get extra no. of shares as dividend and simultaneously price of the stock declines as a result of increase no. of stock. To get a real amount of dividend following model

has been used though out, there are no any model and formula. So, the model has been developed considering practical as well as theoretical aspects after discussions with NEPSE staffs and investors.

The mpdel is:-

Total dividend amount=Cash Div. + Stock Div. % × next year's MPS

Where,

Div. = Dividend

MPS = Market price per share.

iv)   Return on common stock (Rj):

Return on common stock is also known as single period rate of return. It is the capital appretiation plus dividend yield by initial stock price.

Mathematically;

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

Where;

D$_t$ =   Cash div. received during the "t" period.

P$_t$ =   Price of security at 't' time.

P$_{t-1}$ =   Price of security at 't-1' time.

v)   Expected rate of return on common stock, E(Rj):

Expected rate of return is the average rate of return on common stock. It is obtained by arithmetic mean of the past year's return.

Mathematically;

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

Where ;

E(R$_j$)   =   Expected rate of return on stock 'j'

R$_j$ =   Return on stock 'j'

n   =   Number of years that the return is taken

$\sum$ =   Sign of summation

vi)   Return on Market (Rm):

It is the % increase in NEPSE index. Market return is the average return of the market as a 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.

vii)   Expected return on market, E(R$_m$):

It is average return of future expectation. It is calculated by summing up the past return and dividing by no. of samples period.

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

where;

$\sum$R$_m$ =   Summation of market return.

N   =   No. of sample period.

viii)   Standard Deviation:

It is the statistical measure of variability of return. It is the most popular and most useful measure of dispersion. Mainly it measures the deviation from expected mean return. Standard deviation, usually denoted by the letter σ (sigma). Standard Deviation is the square root of the variance. Standard Deviation can be calculated using historical data also

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

Where;

σ$_j$ =   Standard Deviation of return of stock 'j' during the time period n.

R$_j$ =   Return on stock j

E(R$_j$)   =   Expexted return on stock j

N   =   no. of years

ix)   Coefficient of Variation (C.V.) :

The other useful measure of risk is the coefficient of variation. It gives the risk per unit of the expected return and gives the result regarding the unit of risk to bear for earning one unit of return.

$$\text{Coefficient of Variation (C.V.)} = \frac{\sigma}{E(R_j)} \times 100\%$$

Where,

σ   =   Standard Deviation

E(R$_j$)   =   Expected return on stock j

xi) Portfolio Return:

The expected return of a Portfolio is simply a weighted average of the expected return of the securities comprising that portfolio. The weights are the proportion of total funds invest in each security and the sum of weight equals to 100%. The return on the portfolio in case of only two assets portfolio is given by:

$$E(r_p) = W_i . E(R_i) + W_j E(R_j)$$

Where,

r_p =   Portfolio return.

W_i =   Weight on security i.

W_j =   Weight on security j.

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

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

xii) Portfolio Risk:

Risk of a portfolio is not the weighted average of the standard deviation of the specific securities comprising that portfolio. It rather depends upon the co-movement (interative risk) among the security as well. This interactive risk is measure by co-variance and correlation which is relative measurement. A statistical measure of the degree to which variable such as securities return move together is correlation. The formula for the calculation of portfolio risk for two assets case is given below:

$$\sigma_p = \sqrt{\sigma_i^2 w_i^2 + \sigma_j^2 w_j^2 + 2Cov(R_i . R_j)W_i W_j}$$

Where,

σ_p =   Portfolio standard deviation

σ_i^2 / σ_j^2 =   Variance of assets i and j

Cov $((R_i.R_j)$ =   covariance between assets i and j

xiii) Minimum Variance Portfolio :

It is the proportion of stock that minimizes the possible (unsystematic) risk. It can be calculated by finding out the proportion of investment in each asset.

Mathematically,

$$W_i = \frac{\sigma_j^2 - Cov\,(R_i R_j)}{\sigma_i^2 + \sigma_j^2 + 2Cov(R_i R_j)}$$

Where,

W_i =   Optimal weight to invest in stock i

σ_p =   Portfolio standard deviation

$\sigma_i^2 / \sigma_j^2 =$ Variance of assets i and j

Cov $((R_i.R_j)$ = covariance of return between assets i and j

xiv) Correlation coefficient :

The correlation is also a measure of the relationship between two variables. Correlation may be positive or negative. Its value is limited between the range of plus one and minus one. It can be calculated as

$$P_j^i = \frac{Cov_j^i}{\sigma_o \sigma_j}$$

Where,

P_j^i =   Correlation coefficient

Cov_j^i = covariance of return between assets i and j

σ_i/σ_j = Standard deviation of stock i and j.

Where, σi and σj are the standard deviations of returns for assets i and j and ρij is the correlation coefficient for asset i and j.

Various cases of correlation and risk condition :

1.   Perfectly Positive Correlation ($\rho_{ij} = +1$)

Return on two perfectly positive correlated stocks would move up same direction. So risk can not be diversified away by investing in such assets in portfolio. Portfolio of such stocks would be exactly as risky as the individual stocks.

2.   Perfectly Negative Correlation ($\rho_{ij} = -1$)

Return on two perfectly negative correlated stocks would move up exactly opposite direction so can be completely eliminated by holding such stocks in portfolio. Perfectly negative correlation is almost never found in the real world.

3.   No Relation Between Returns ($\rho_{ij} = 0$)

When the correlation between two stocks is exactly zero there is no relationship between returns, they are independent of each other.in such case some risk can be reduced.

4.   Intermediate risk (($\rho_{ij} = +0.5$)

Most of the stock returns are positively correlated but not perfectly. On average the returns on two stocks would lie on the range of +0.4 and +0.75. Under this condition the portfolio of stocks reduces risk but not eliminate it completely.

xv)   Beta :

Beta coefficient of any security tells how sensitive in that securities return with respect to the return in the market. Beta coefficient is an index that measure the systematic risk of different assets. Beta coefficient of a particular stock will be less than 1, equal to 1 and more than 1 but the beta for market will be always 1.

Mathematically,

$$\beta_j = \frac{Cov(R_j.R_m)}{\sigma^w m}$$

Where,

β_j =   Beta coefficient of stock 'j'.

$\sigma^2 m$ =   Variance of market return.

xvii)   Partitioning of total risk:

$$\text{Systematic Risk Proportion } (p^2) = \frac{\beta_j^2 . \sigma m^2}{\sigma_j^2}$$

$$\text{Unsystematic Risk Proportion } (1 - p^2) = \frac{Var(e)}{\sigma_j^2}$$

Where;

β_j^2 =   Beta suare of stock 'j'.

σm^2 =   Variance of market return.

σj^2 =   Variance of stock 'j'.

Var(e)   =   Residual variance.

xviii)   Testing of Hypothesis:

Testing of hypothesis is one of the most important aspects of the theory of decision making. The two complementary hypothesis that are set up in the

testing of hypothesis are the null hypothesis and the alternative hypothesis. These two hypothesis have a reciprocal relation to each other.

Null hypothesis :

A statistical hypothesis or assumption made about the population parameter to testing its validity for the purpose of possible acceptance is called null hypothesis is usually denoted by H_o.

Alternative hypothesis :

A complementary hypothesis is the null hypothesis is called an alternative hypothesis. In other words, a hypothesis which is set up against the null hypothesis is called in alternative hypothesis. An alternative hypothesis is also called hypothesis of difference. It is usually denoted by H_1.

Test of significance of single mean for small sample

Step-1 Formulation of Ho and H1

Null Hypothesis, Ho: $\mu = \mu o$ i.e. the population has a particular mean μo. In other words, there is no significant difference between sample mean (x) and population mean (μ).

Alternative Hypothesis, H1: $\mu \neq \mu o$ (two tail test) i.e. the population mean is not equal to μo. In other words, there is significant difference between sample mean (x)and population mean (μ).or

Alternative Hypothesis, H1: H1< Ho (left tailed test) i.e. the population mean is less than μo.

Alternative Hypothesis, H1: H1> Ho (right tailed test) i.e. the population mean is greater than μo.

(only one alternative hypothesis is to be chosen depending upon the nature of problem.)

Step-2 Level of significance (α): use $\alpha = 5\%$, unless otherwise stated.

Step-3 Type of test: since n≤30 apply t-test.

Step-4 Test statistics: under Ho: Test statistics is

$$t = \frac{\overline{X} - \mu}{\dfrac{s}{\sqrt{n-1}}}$$

where,

S = Based sample standard deviation.

Step-5 Table: The tabulated value of t at α % level of significance for (n-1) d.f. is obtained from table according as whether alternative hypothsis is two tailed test or one tailed test.

Step-6 Decision:

i)   if tcal ≤ tcab then Ho is accepted and H1 is rejected.

ii)   if tcal ≥ tcab then H1 is accepted and Ho is rejected.

LIMITATION OF METHOD:

1.   This study based on the historical figures to forecast the future, i.e. there search design for this study is historical past may be the genesis for future but the past may not happen in future in same manner.

2.   The population is only 17 commercial banks, which are listed in NEPSE. And the total no. of samples are only six listed commercial banks. So, the samples do not cover whole industry.

3.   The source of data is secondary and mainly. Collected from web site of NEPSE. So, accuracy of methodology is based on the secondary data.

4.   The data analysis tool are based on financial and statistical concepts. The values provided by such   tool may be the approximation values only.

CHAPTER IV

DATA PRESENTATION AND ANALYSIS

This chapter is the main body of the study. It comprises detail data of market price of stock and dividend of selected sample banks and NEPSE index. The data are arrange into table, diagrams, graph and figure as per is nature. The data are so arrange are scrupulously analyzed and interpreted to serve the purpose of study using the various financial as well as statistical tools and techniques. It analyses the risk and return behavior within and between the selected commercial bank, market sensitivity of stock and risk and of individual stock and their interpretation.

4.1 ANALYSIS OF INDIVIDUAL BANK, FINANCIAL INDICATORS:

There are 17 commercial Banks listed in NEPSE. Due to the various limitations only six commercial banks are taken for study. Risk and Return on common stock of these banks are presented and analyzed below. Whole working cited here facilitate as able to separate each commercial bank in terms of their risk and return and facilitate as to how these dimension help to make decision to invest in common stock of individual bank.

4.1.1 NABIL Bank Ltd

Table No- 4.1

Summary of the financial performance of NABIL Bank Ltd.

Fiscal Year	MPS (Rs.)	DPS (Rs)	BPS (Rs)	EPS (Rs)
2001/02	700	30	233	55.25
2002/03	740	50	267	84.66
2003/04	1000	65	301	92.61
2004/05	1505	70	337	105.49
2005/06	2240	85	381	129.21
2006/07	5050	12.59	418.39	137.08

Sources: NEPSE index and AGM report of NABIL

The above table presents the summary of financial performance of NABIL Bank Ltd for the last six year (2001/02 – 2006/07). From the above table, it can be revealed that Mps hap been continuously increasing each year till 2006/07. The organization is distributing it DPS each year in increasing trends but last year DPS was decreased to 12.59 from 85. Like wise, the BPS and EPS are also in increasing trend. It shows the betterment in its performance each year.

Table No. 4.2
Calculation of expected rate of return, and SD and CV of NABIL

Fiscal Year	R	r-E(r)	$[r-E(r)]^2$
2002/03	12.86	-46.10	2125.2100
2003/04	43.92	-15.04	226.2016
2004/05	57.50	-1.46	2.1316
2005/06	54.49	-4.47	19.9809
2006/07	126.01	67.05	4495.7025
$\sum r=294.78$		$\sum[r-E(r)]^2= 6869.2266$	

Figure 4.1

Annual Required Rate of Return on Common Stock of NABIL
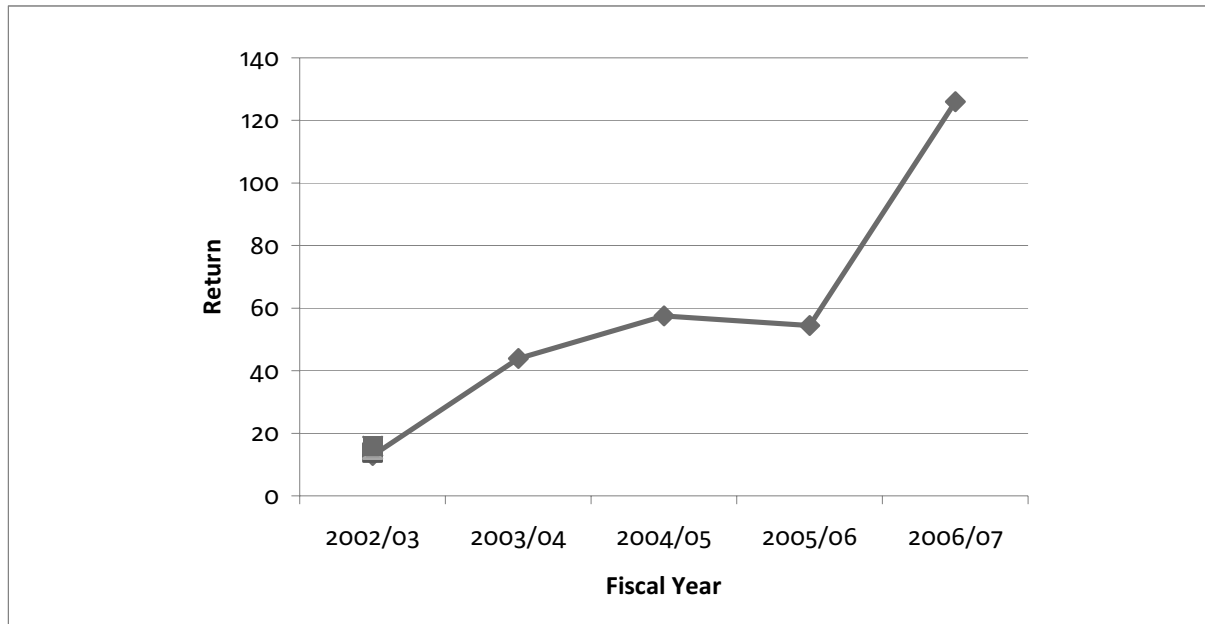
Expected Rate of Return $\quad = \quad \dfrac{\sum r}{n}$

$\qquad\qquad\qquad\qquad\qquad = \quad \dfrac{294.78}{5}$

$\qquad\qquad\qquad\qquad\qquad = \quad 58.96$

Standard Deviation (σ) $\quad = \quad \sqrt{\dfrac{\sum[r - E(r)]^2}{n-1}}$

$\qquad\qquad\qquad\qquad\qquad = \quad \sqrt{\dfrac{1717.3067}{5-1}}$

$\qquad\qquad\qquad\qquad\qquad = \quad 41.44$

Coefficient of variation (C.V.) $\quad = \quad \dfrac{E(r)}{\sigma} \times 100\,\%$

$\qquad\qquad\qquad\qquad\qquad = \quad \dfrac{58.96}{41.44} \times 100\,\%$

$\qquad\qquad\qquad\qquad\qquad = \quad 70.28\%$

4.1.2 Nepal Investment Bank Ltd

Table No. 4.3

Summary of the financial performance of Nepal Investment Bank Ltd

Fiscal Year	MPS (Rs.)	DPS (Rs)	BPS (Rs)	EPS (Rs)
2001/02	760	30	307.95	33.59
2002/03	795	20	216.24	39.56
2003/04	940	15	246.89	51.7
2004/05	800	12.5	200.8	39.5
2005/06	1260	55.46	239.67	59.35
2006/07	1729	5.00	234.37	62.57

Sources: NEPSE index and AGM report of NIBL

The above table presents the summary of financial performance of NABIL Bank Ltd from 2001/02 to 2006/07.The above table shows Mps was dropped to Rs 800 (2004/05) from Rs 940 (2003/04) firstly. But after this it has been continuously increasing each year till 2006/07. The bank has distributed different amount of DPS over the period. BPS of the organization is not consistent. The EPS of the Company is in increasing trend except the year 2004/05.

Table No. 4.4

Calculation of Expected Rate of Return, SD & CV of NIBL.

Fiscal Year	R	r – E(r)	[r – E(r)]^2
2002/03	7.24	-15.93	253.7649
2003/04	20.13	-3.04	9.2416
2004/05	-13.56	-36.73	1349.0929
2005/06	64.43	41.26	1702.3876
2006/07	37.62	14.45	208.8025
	$\sum r = 115.86$		$\sum [r - E(r)]^2 = 3523.2895$

Figure 4.2

Annual Required Rate of Return on Common Stock of NIBL
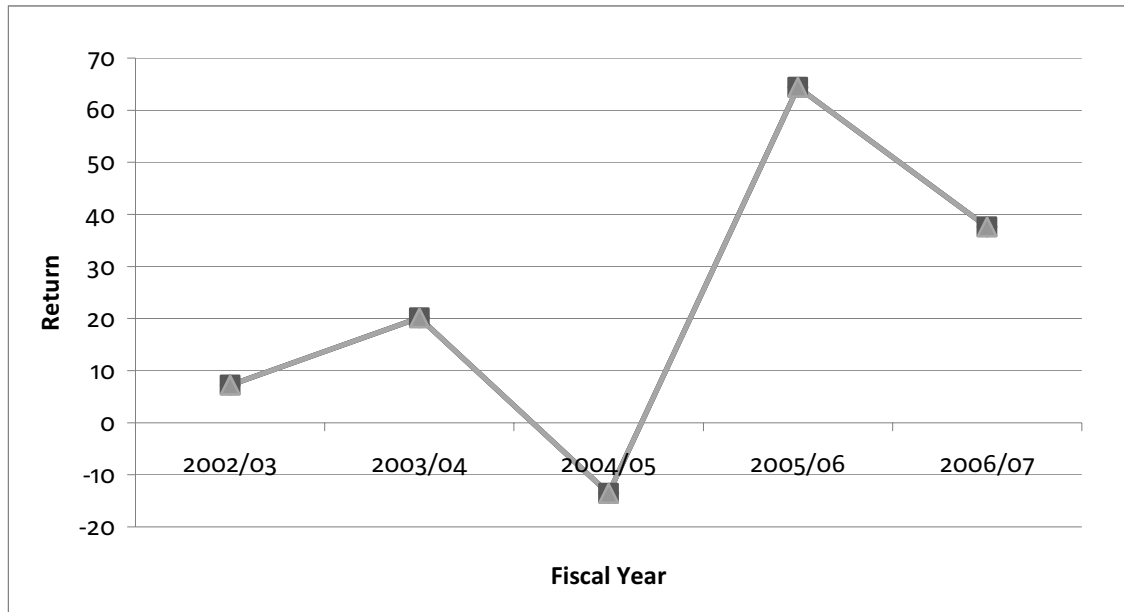
Expected Rate of Return $\quad = \quad \dfrac{\sum r}{n}$

$$= \quad \dfrac{115.86}{5}$$

$$= \quad 23.17$$

Standard Deviation (σ) $\quad = \quad \sqrt{\dfrac{\sum[r-E(r)]^2}{n-1}}$

$$= \quad \sqrt{\dfrac{3523.2895}{5-1}}$$

$$= \quad 29.68\%$$

Coefficient of variation (C.V.) $= \quad \dfrac{\sigma}{E(r)} \times 100\,\%$

$$= \quad \dfrac{29.68}{23.17} \times 100\,\%$$

$$= \quad 128.10\%$$

4.1.3 Standard Chartered Bank Ltd.

Table No. 4.5

Summary of the financial performance of Standard Chartered Bank Ltd

Fiscal Year	MPS (Rs.)	DPS (Rs)	BPS (Rs)	EPS (Rs)
2001/02	1575	100	363.86	141.13
2002/03	1640	120	403.15	149.3
2003/04	1745	110	399.25	143.55
2004/05	2345	120	422.38	143.14
2005/06	3775	140	468.22	175.84
2006/07	5900	80	512.12	167.37

Sources: NEPSE index and AGM report of SCBL

The above table represents the summary of financial performance of standard chartered Bank Ltd from 2001/02 to 2006/07. From the above table, MPS was in increasing trend till 2006/07. The bank has distributed different amount of DPS over the period. The BPS was in increasing trend except for the year 2003/04. EPS of the organization is not consistent.

Table No. 4.6

Calculation of Expected Rate of Return, SD & CV of SCBL.

Fiscal Year	R	r-E(r)	$[r- E(r)]^2$
2002/03	11.75	-26.55	704.9025
2003/04	13.11	-25.19	634.5361
2004/05	41.26	2.96	8.7616
2005/06	66.95	28.65	820.8225
2006/07	58.41	20.11	404.4121
	$\sum r=191.48$		$\sum[r- E(r)]^2= 2573.4348$

Figure 4.3
Annual Required Rate of Return on Common Stock of SCBL
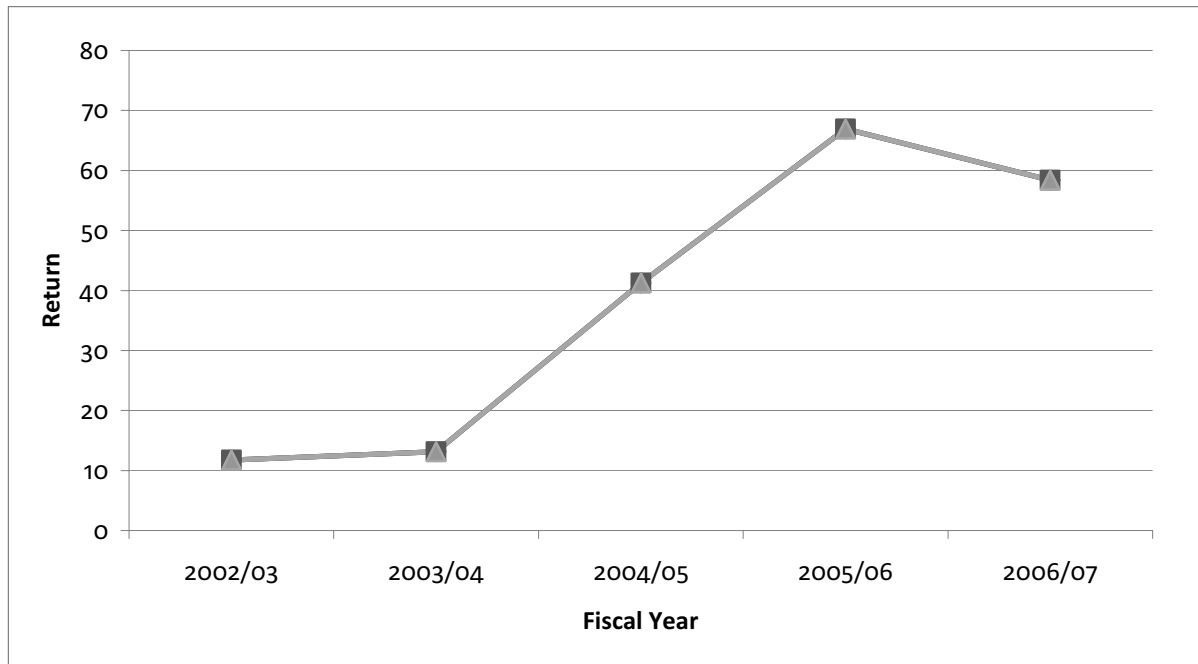
$$\text{Expected Rate of Return} \quad = \quad \frac{\sum r}{n}$$

$$= \quad \frac{191.48}{5}$$

$$= \quad 38.3$$

$$\text{Standard Deviation } (\sigma) \quad = \quad \sqrt{\frac{\sum[r - E(r)]^2}{n-1}}$$

$$= \quad \sqrt{\frac{2573.4348}{5-1}}$$

$$= \quad 25.36\%$$

$$\text{Coefficient of variation (C.V.)} \quad = \quad \frac{\sigma}{E(r)} \times 100\,\%$$

$$= \quad \frac{25.36}{38.30} \times 100\,\%$$

$$= \quad 66.21\%$$

4.1.4 Himalayan Bank Ltd

Table No. 4.7

Summary of the financial performance of Himalayan Bank Ltd.

Fiscal Year	MPS (Rs)	DPS (Rs)	BPS (Rs)	EPS (Rs)
2001/02	1000	35	220.02	60.26
2002/03	836	25	247.81	49.45
2003/04	840	20	246.33	49.05
2004/05	920	31.58	239.59	47.91
2005/06	1100	35	228.72	59.24
2006/07	1740	15	264.74	66.66

Sources: NEPSE index and AGM report of HBL

The above table presents the summary of financial performance of the Himalayan Bank Ltd form 2001/02 to 2006/07. From the above table, it can be revealed that the MPS was dropped to Rs 836 (2002/03) from Rs 1000 (2001/02). But after this it has been continuously increasing each year till 2006/07. The bank has distributed different amount of DPS over the period and BPS of the organization is not consistent. The EPS was lowered at the mid term of the study period and then it was in increasing trend till 2006/07.

Table no. 4.8

Calculation of expected Rate of Return, SD & CV of HBL

Fiscal Year	R	r-E(r)	$[r- E(r)]^2$
2002/03	-13.90	-30.93	956.6649
2003/04	2.87	-14.16	200.5056
2004/05	13.28	-3.75	14.0625
2005/06	23.37	6.34	40.1956
2006/07	59.55	42.52	1807.9504
	$\sum r=85.17$		$\sum[r- E(r)]^2 = 3019.379$

Figure 4.4
Annual Required Rate of Return on Common Stock of HBL
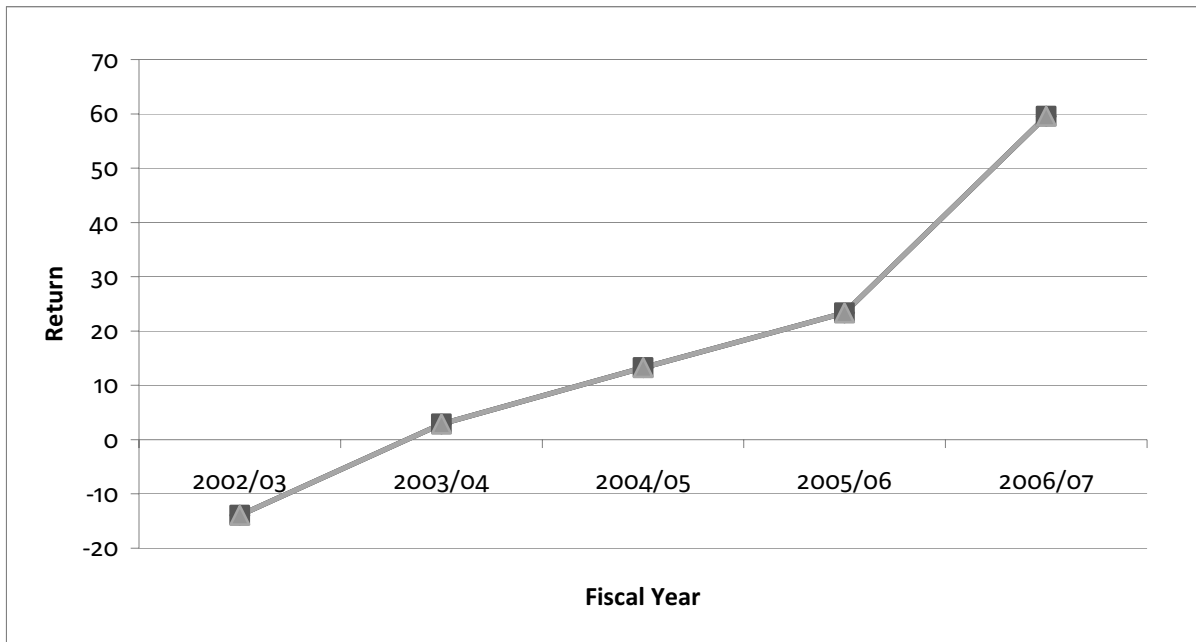
Expected Rate of Return $\quad = \quad \dfrac{\sum r}{n}$

$$= \quad \dfrac{85.17}{5}$$

$$= \quad 17.03$$

Standard Deviation (σ) $\quad = \quad \sqrt{\dfrac{\sum[r-E(r)]^2}{n-1}}$

$$= \quad \sqrt{\dfrac{3019.379}{5-1}}$$

$$= \quad 27.47\%$$

Coefficient of variation (C.V.) $\quad = \quad \dfrac{\sigma}{E(r)}\times100\,\%$

$$= \quad \dfrac{27.47}{17.03}\times100\,\%$$

$$= \quad 161.30\%$$

4.1.5. Nepal Bangladesh Bank Ltd

Table No. 4.9

Summary of the financial performance of NB Bank Ltd.

Fiscal Year	MPS (Rs)	DPS (Rs)	BPS (Rs)	EPS (Rs)
2001/02	490	0	174	18.27
2002/03	360	0	190	19.86
2003/04	354	0	182	0.73
2004/05	265	0	-32.59	-104.12
2005/06	199	0	-217	-249.65
2006/07	550	0	-364	-147.47

*Sources: NEPSE index and AGM report of NBBL*

The above table presents the summary of financial performance of Nepal Banladesh Bank Ltd. from 2001/02 to 2006/07. from the above table, it can be revealed that the MPS was in decreasing trend till 2005/06 but last year it was increased. No dividend has been distributed since 2001/2002 till now. The EPS and BPS of the organization is also decreasing from the year 2002/03 to 2006/07.

Table no. 4.10

Calculation of Expected Rate of Return, S.D CV of NBBL.

Fiscal Year	R	r-E(r)	$[r- E(r)]^2$
02/03	-26.53	-46.16	2130.7456
03/04	-1.67	-21.30	453.6900
04/05	-25.14	-44.77	2004.3529
05/06	-24.91	-44.54	1983.8116
06/07	176.38	156.75	24570.5625
	$\sum r=98.13$		$\sum[r- E(r)]^2=31143.1626$

Figure 4.5
Annual Required Rate of Return on Common Stock of NBBL
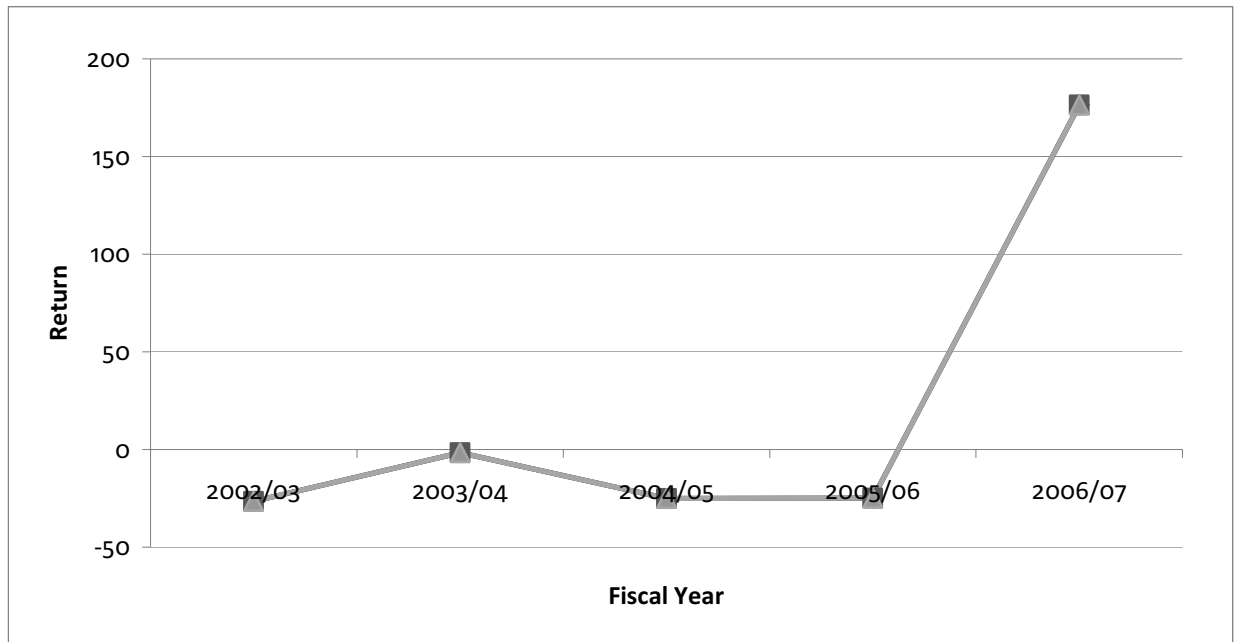
Expected Rate of Return $= \dfrac{\sum r}{n}$

$= \dfrac{98.13}{5}$

$= 19.63$

Standard Deviation (σ) $= \sqrt{\dfrac{\sum[r - E(r)]^2}{n-1}}$

$= \sqrt{\dfrac{31143.1626}{5-1}}$

$= 88.24\%$

Coefficient of variation (C.V.) $= \dfrac{\sigma}{E(r)} \times 100\ \%$

$= \dfrac{88.24}{19.63} \times 100\ \%$

$= 449.52\%$

4.1.6 Everest Bank Ltd

Table No. 4.11

Summary of the financial performance of Everest Bank Ltd.

Fiscal Year	MPS (Rs)	DPS (Rs)	BPS (Rs)	EPS (Rs)
2001/02	405	20	170.76	32.91
2002/03	455	0	150.1	29.9
2003/04	680	0	171.52	45.58
2004/05	870	20	219.87	54.22
2005/06	1379	0	217.67	62.78
2006/07	2430	10	231.95	57.22

Sources: NEPSE index and AGM report of EBL

The above table represents the summary of the financial performance of the Everest Bank Ltd the above last six Years (2001/02 to 2006/07). From the above table it can be revealed that MPS has been continuously increasing each year till 2006/07. The bank has distributed dividend only three times within this period at different rate. BPS has been decreased first and then increased. The BPS of the organization is not consistent.

Table no. 4.12

Expected rate of return, S.D. & CV of EBL

Fiscal Year	R	r-E(r)	$[r- E(r)]^2$
02/03	9.88	-35.92	1290.2464
03/04	52.81	7.01	49.1401
04/05	30.88	-14.92	222.6064
05/06	58.51	12.71	161.5441
06/07	76.94	31.14	969.6996
	$\sum$r=229.02		$\sum[r- E(r)]^2$ = 2693.2366

Figure 4.6
Annual Required Rate of Return on Common Stock of EBL.
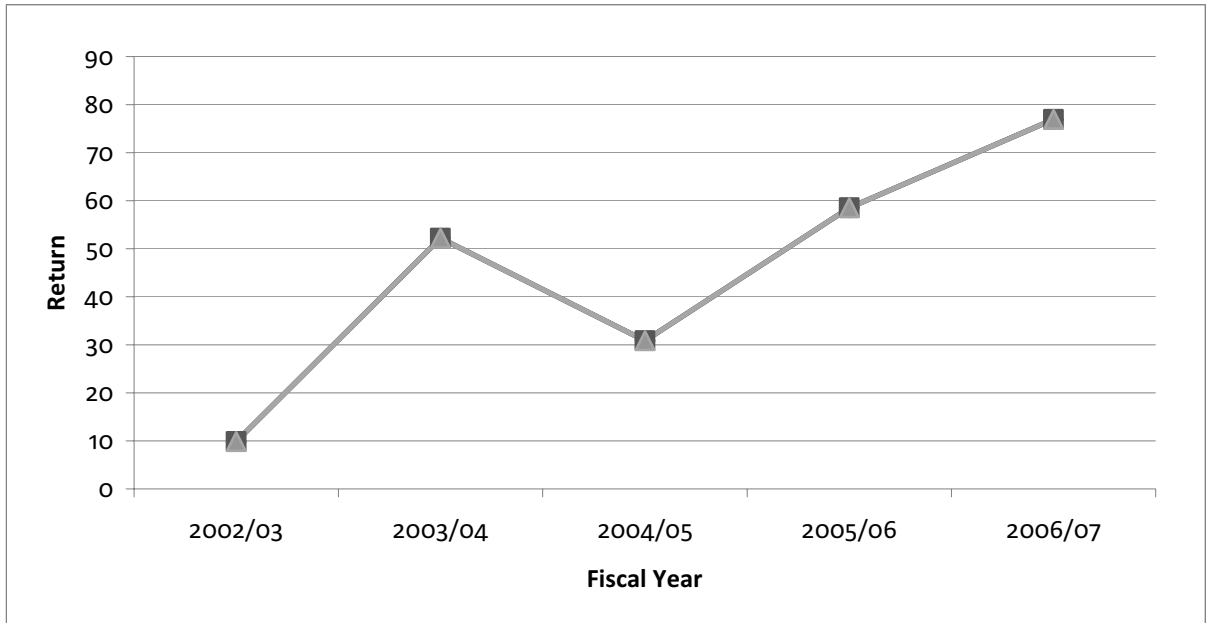
Expected Rate of Return $\quad = \quad \dfrac{\sum r}{n}$

$$= \quad \dfrac{229.02}{5}$$

$$= \quad 45.80\%$$

Standard Deviation (σ) $\quad = \quad \sqrt{\dfrac{\sum [r - E(r)]^2}{n-1}}$

$$= \quad \sqrt{\dfrac{2693.2366}{5-1}}$$

$$= \quad 25.95\%$$

Coefficient of variation (C.V.) $\quad = \quad \dfrac{\sigma}{E(r)} \times 100\,\%$

$$= \quad \dfrac{25.95}{45.80} \times 100\,\%$$

$$= \quad 56.66\%$$

4.2. Inter Bank Comparison:

Analysis of Risk and return is very important concept of the investment activities which can be examined through the various way current owners, potential investors, employees, creditors, government, customers analyze the risk and return for their own interest. For the analysis of risk and return various dimension relating to the common stock and need to calculate. Here to examine 'Risk and Return analysis in context to commercial Bank in Nepal' it is calculated the expected rate of return, standard deviation (σ) and co-efficient of variation (CV) at first. After that it is calculated the portfolio construction using 'Risk Minimizing Weight ' as well as systematic risk portion and unsystematic risk portion by using financial performance (market price per share and Dividend price per share) of 5 year study (2002/03 to 2006/07) of the selected Nepalese commercial Banks.

Table no. 4.13
Summary of SD, ERR and CV of sample commercial Banks

Name of Banks	SD (σ)%	ERR, E(r)%	CV%
NABIL Bank Ltd	41.44	58.96	70.28
Nepal Investment Bank Ltd	29.68	23.17	128.10
Standard chartered Bank Ltd	25.36	38.30	66.21
Himalayan Bank Ltd	27.47	17.03	161.30
Nepal Bangladesh Bank Ltd	88.24	19.63	449.52
Everest Bank Ltd	25.95	45.80	56.66
Total	238.14	202.89	932.07
Average	39.69	33.82	155.35
Highest	88.24	58.96	449.52
Lowest	25.36	17.03	56.66

Figure 4.7
Risk (SD) and Return (ERR) of Sample Commercial Banks
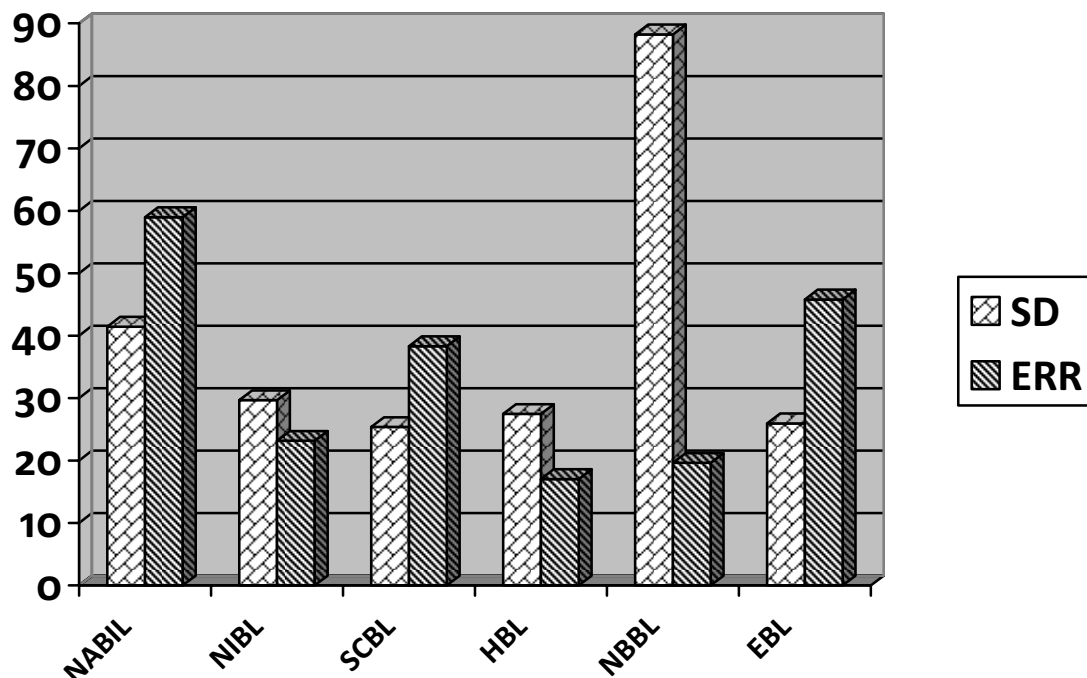
Return to investor refers to the sum of dividend received per share and market price appreciation (a depreciation) per share at end of the year. Share were trading in secondary market is determined by supply and demand factor as well as consensus opinion of investors. It is said to better that market price per share of common stock reflect the performance of bank. The demand of the stock for better banks will higher and market price per share of these banks will be higher, as a result, the return to investors will also become higher.

Among the selected commercial Banks the highest expected rate of return value is 58.96 from NEBIL Bank Ltd. Lowest ERR is found at Himalayan bank (17.03) .The average expected rate of return of these banks is 33.82. In above table shows 3 commercial banks have higher expected rate of

return value than average rate of return and rest have lower expected rate of return value than average rate of return value.

Similarly, the Nepal Bangladesh bank ltd has higher standard deviation value of 88.24 and standard chartered bank gas the lower standard deviation value of 25.36. The average standard deviation value of these banks is 39.69. In table shows 2 commercial banks have higher standard deviation than average standard deviation value and other remaining commercial banks have lower standard deviation value than average value of standard deviation.

In the case of CV, The Nepal Bangladesh bank has maximum CV (449.52%) as its expected rate of return and the Everest Bank Ltd gas lowest value of CV (56.66%).

According to this analysis the risk taker investor chose Everest because its risk and return ratio is satisfactory as well as its coefficient of variance is lower than among the selected banks.

4.3. PORTFOLIO ANALYSIS:

A port folio is a combination of two or more assets. The portfolio would be able to reduce unsystematic of diversifiable risk. It is the random selection of securities that are to be added to portfolio. It reduces a portfolio's total diversifiable risk to zero. Previous analysis to risk and return is based on the investment in single security. The expected return of the portfolio is simply a weighted average of the expected rate of return of the security comprising that portfolio the weight are equal to the proportion of total fund invested in each security. The sum of weight must be 100%. Analysis has shown that many Nepalese private investors place their entire wealth in single asset. If they are construct a portfolio or group of investment in such kind of asset are negatively correlated. They can

reduce unsystematic risk dramatically without loosing their. return. Therefore, we have to extend our analysis of risk and return portfolio context.

Here, the study formed the two assets portfolio through the combination of selected commercial bank.

SELECTED SAMPLE BANKS.

NABIL Bank Ltd.

Nepal Investment Bank Ltd.

Standard charted Investment Bank Ltd.

Himalayan Bank Ltd.

Nepal Bangladesh Bank Ltd.

Everest Bank Ltd.

COMBINATION OF BANKS

NABIL Bank Ltd. & Nepal Investment Bank Ltd.

NABIL Bank Ltd. & Standard Chartered Bank Ltd.

NABIL Bank Ltd. & Himalayan Bank Ltd.

NABIL Bank Ltd. & Nepal Bangledesh Bank Ltd.

NABIL Bank Ltd. & Everest Bank Ltd.

Nepal Investment Bank Ltd. & standard chartered Bank Ltd.

Nepal Investment Bank Ltd. & Himalayan Bank Ltd.

Nepal Investment Bank Ltd. & Nepal Bangladesh Bank Ltd.

Nepal Investment Bank Ltd. & Everest Bank Ltd.

Standard chartered Bank Ltd. & Himalayan Bank Ltd.

Standard chartered Bank Ltd. & Nepal Bangladesh Bank Ltd.

Standard chartered Bank Ltd. & Everest Bank Ltd.

Himalayan Bank Ltd. & Nepal Bangladesh Bank Ltd.

Himalayan Bank Ltd. & Everest Bank Ltd.

Nepal Bangladesh Bank Ltd. & Everest Bank Ltd.

Now, Investors have to invest their amount on feasible and efficient combination of two assets at a time. Such combined minimizes the risk factor associated with the investment. There are so many possibilities of forming portfolio. Here, the study has to take portfolio construction using risk minimizing weight.

Summary of Portfolio risk & return, covariance (COV) and correlation coefficient (ρ) of sample Banks.

Table No. 4.14
Using risk minimizing weight

Combination of Banks	Weight		E(rp)	σp	Cov	ρ
NABIL & NIBL	0.27	0.73	32.83	27.46	404.54	0.3289
NABIL & SCBL	-0.06	1.06	37.06	25.28	704.7	0.6706
NABIL & HBL	-1.52	2.52	-46.7	14.3	1116.74	0.9810
NABIL & NBBL	1.55	-0.55	80.59	29.07	3305.72	0.9040
NABIL & EBL	-0.39	1.39	40.67	24.2	900.85	0.8377
NIBL & SCBL	0.3	0.7	33.76	24.29	465.87	0.6189
NIBL & HBL	0.43	0.57	19.67	24.45	387.38	0.4751
NIBL &NBBL	0.98	0.02	23.10	29.62	717.95	0.2741
NIBL & EBL	0.3	0.7	39.01	25.04	518.32	0.6730
SCBL & HBL	0.69	0.31	31.71	24.79	550.88	0.7908
SCBL & NBBL	1.03	-0.03	38.86	25.20	876.44	0.3917
SCBL & EBL	0.53	0.47	41.83	23.32	430.82	0.6547
HBL & NBBL	1.30	-0.30	16.25	19.01	2069.96	0.8540
HBL & EBL	0.29	0.71	37.46	25.64	618.09	0.8671
NBBL & EBL	-0.18	1.18	50.51	22.37	1622.95	0.7088
Average			31.77	24.30		
Maximum			80.59	29.62		
Minimum			-46.7	14.3		

(Detail Calculation is Shown in Appendix no.B1 to 15)

4.4 ANALYSIS OF EFFECTS OF PORTFOLIO ON RISK AND RETURN:

In this section, the portfolio risk and return between banks are calculated and analyzed. The required proportionate weight to make portfolio is calculated by using the risk minimizing weight. The risk minimizing weight for different banks is showed in above table. The portfolio formed assuming only two banks once at a time to calculate the portfolio risk and return. It helps to know on what extent the portfolio is success to decrease the level of risk and which two banks are best to invest for the risk minimizing purpose as well as to know the effects of portfolio on returns.

There are altogether 15 combinations of 6 commercial banks. Among these combinations some banks have negative weight to minimize the risk. Negative weight means, investors have to think investment on this stock to minimize the risk. If there was investment in past investors have to sell these stocks which have negative weight. In case of above table, while forming portfolio of NABIL & SCBL, NABIL & HBL and NABIL & EBL investors have to think for the investment on the stock of NABIL to purpose of risk minimizing. Similarly, in case of the portfolio of NABIL & NBBL investors have to withdraw their investment from the stock of NBBL. In the case of portfolio of SCBL & NBBL, Investors have to withdraw their investment from the stock of NBBL. In the case of HBL & NBBL investors have to withdraw their investment from the stock of NBBL. In the case of NBBL & EBL investors have to think for the investment on the stock of NBBL to purpose of risk minimizing.

In the case of risk, four combinations are mentioned higher risk value than the average value of risk. Similarly, other four combinations are mentioned lower risk value than the average value of risk. The highest risk value is found at the combination of NIBL & NBBL which is 29.62%. The 2nd highest value of risk is found at the combination of

NABIL & NBBL which is 29.07%. The combination of NABIL & NIBL also seems to be higher value with 27.46 and the combination of HBL & EBL has risk value of 25.64% shows similar trend of risk value. Similarly, the lowest value of risk is found at the combination of NABIL & HBL, HBL & NBBL, NBBL & EBL and SCBL & EBL with the risk value of 14.3% , 19.01%, 22.37% and 23.32%, respectively. The average risk value of the combination of different selected commercial banks is 24.30%.Ttherefore, the combination of NIBL & NBBL, NABIL & NBBL, NABIL & NIBL and HBL & EBL are more risky securities. And the combination of NABIL & HBL, HBL & NBBL, NBBL & EBL and SCBL & EBL are lower risky securities respectively.

In the cases of return, four combinations are mentioned higher return than the average value of return. Similarly, other four combinations are mentioned lower return than average value of return. The highest return value is found at the combination of NABIL & NBBL which is 80.59%. The 2nd highest return value is found at the combination of NBBL & EBL which is 50.51%. The combination of SCBL & EBL has return value of 41.83% and the combination of NABIL & EBL also seems to be higher return value with 40.67%. Similarly, the lowest value of return is found at the combination of NABIL & HBL which is 46.7% with negative sign. The combination between HBL & NBBL, NIBL & HBL and NABIL & SCBL has lower return value of 16.25%, 19.67% and 21.02% respectively. The average value of return of the combination of different selected commercial banks is 31.77%. Therefore, the combination of NABIL & NBBL, NBBL & EBL, SCBL & EBL and NABIL & EBL are giving higher return. And the combination of NABIL & HBL, HBL & NBBL, NIBL & HBL and NABIL & SCBL are giving the lower return than average return value of these respectively.

The correlation between the return of the two stocks play a significant role in the risk reduction by portfolio construction. If the correlation is perfectly positive or 1 then the portfolio is not be able to reduce any level of risk .And if the correlation is perfectly negative or -1, then the proper combination of the two stocks is be able to reduce unsystematic risk even up to zero. It means positive correlation between stocks is not so beneficial and vice-versa.

Here, in case of portfolio of the overall sample banks common stocks the correlation is positive that is why the portfolio construction between these sample banks are not beneficial.

4.5. THE RELATIONSHIP BETWEEN RISK AND RETURN IN NEPALESE COMMERCIAL BANKS:

Risk and Return are naturally related term to each other. The financial literature and previous research works in related topic clearly indicated the linear relationship between firms to its risk and return. Theoretically a high risk stimulates higher the rate of return. However, in the case of Nepalese commercial banks, these two terms are not related in liner way. The diverse relationship of risk and return pattern in different combination has been extracted. Some of the combinations have high risk – high return, some combination produce high risk – low return and only one combination has high risk - low return with the negative value.

Here, to show the relationship between risk and return in Nepalese commercial banks the combination are categorized as per the following group and they are analyzed in the paged follow:

Group-A,   High Risk   -   High Return

Group-B,   High Risk   -   Low Return

Group-C,   High Risk   -   Low Return with negative sign

Group- A

'High Risk – High Return

Table-15
Combination of sample Banks having High Risk – High Return

S. No.	Combination of banks	Risk (%)	Return%
1.	NABIL & NIBL	27.46	32.83
2.	NABIL & SCBL	25.28	37.06
3.	NABIL & NBBL	29.07	80.59
4.	NABIL & EBL	24.20	40.67
5.	NIBL & SCBL	24.29	33.76
6.	NIBL & EBL	25.04	39.01
7.	SCBL & HBL	24.79	31.71
8.	SCBL & NBBL	25.20	38.86
9.	SCBL & EBL	23.32	41.83
10.	HBL & EBL	25.64	37.46
11.	NBBL & EBL	22.37	50.51
	Total	276.66	464.29
	Average	25.15	42.21
	Maximum	29.07	80.59
	Minimum	22.37	31.71

Among 15 combinations of the banks, 11 combinations have high risk with high return. The return in this case is more than risk. Majority of the banks combination seems to be having high risk with high return. The combination of NABIL and NBBL has maximum rate to return (80.59) with risk value (29.07) and NBBL and EBL has maximum rate of return (50.51) with a lowest risk value (22.37).

The average risk value of this group is the 25.15 and return value is 42.21. The combination between NABIL & NBBL and NBBL & EBL have largest return value than its average return value other remaining

combination have smaller return value than average return value. In other way, the combination between NABIL & NIBL, NABIL & SCBL, NABIL & NBBL, SCBL and NBBL and HBL & EBL have largest risk value than average risk value and other remaining combination have smaller risk value than average risk value.

Group B:

High risk-low return

Table no 16

Combination of sample Banks having High Risk – Low Return

S.No	Combination of bank	Risk (%)	Return (%)
1.	NIBL & HBL	24.45	19.67
2.	NIBL & NBBL	29.62	23.10
3.	HBL & NBBL	19.01	16.25
	Total	73.08	59.02
	Average	24.36	19.67
	Maximum	29.62	23.10
	Minimum	19.01	16.25

The combination of selected commercial banks on this group are characterized the high risk – low return tendency. Three combinations of the banks fall under this group.

The larger risk under this group is of the combination of NIBL & NBBL which has risk value is 29.62 with the return is 23.10 and HBL & NBBL is lowest risk value of 19.01 with the return value is 16.25.

The average risk value of this Group is 24.36 and the return value is 19.67. The combination between NIBL & HBL and NIBL & NBBL have

large risk value than average risk value. Similarly, HBL & NBBL have lower risk value than average risk value.

In another way, NIBL & NBBL has large return value than average return value. Similarly HBL & NBBL has lower return value than average return value and NIBL & HBL has same return value with average return value.

Group C.

High Risk – Low Return having negative sign:

Table no. 17

S.No.	Combination of Bank	Risk	Return
1.	NABIL & HBL	14.3	-46.7

Among 15 combination of selected commercial banks only one combination of bank fall under this group. The combination of NABIL & HBL has risk value is 14.3 having return value is 46.7 with negative sign.

4.6. MARKET RISK AND RETURN:

There is only stock market in Nepal, known as Nepal Stock Exchange, shortly NEPSE. In the context of Nepalese financial market, average market movement is represent by the NEPSE index and average return or market return can be found by using NEPSE index. Its market return, Expected market return, standard deviation and coefficient of variance calculated as follows.

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

where,
NI_{t+1} =   NEPSE Index at "t" time.
NI_t =   NEPSE Index at "t-1" time.

Table no. 18

Calculation of market Risk and Return

Year	NI	r_m	$r_m - E(r_m)$	$[r_m - E(r_m)]^2$
2001/02	227.5	–	–	–
2002/03	204.9	-9.93	-37.79	1428.0841
2003/04	222	8.35	-19.51	380.6401
2004/05	286.7	29.14	1.28	1.6384
2005/06	386.8	34.91	7.05	49.7025
2006/07	684	76.84	48.98	2399.0404
		$\sum r_m = 139.31$	$\sum [r_m - E(r_m)]^2 = 4259.1055$	

Expected market Return $E(r_m)$ $= \dfrac{\sum r_m}{n}$

$$= \frac{139.31}{5}$$

$$= 27.86\%$$

Standard Deviation (σ_m) $= \sqrt{\dfrac{\sum [r_m - E(r_m)]^2}{n-1}}$

$$= \sqrt{\frac{4259.1055}{5-1}}$$

$$= 32.63\%$$

Coefficient of Variation (C.V.) $= \dfrac{\sigma_m}{E(r_m)} \times 100\%$

$$= \frac{32.63}{27.86} \times 100\%$$

$$= 117.12\%$$

Note: The expected market return (i.e. average market rate of return), standard deviation and coefficient of variation of market are 27.86%, 32.63% and 117.12%s respectively.

4.7 ANALYSIS OF MARKET SENSITIVITY :

By using beta co-efficient, market sensitivity of stock is calculated and explained. Stock with higher the beta indicates greater the market sensitivity. Stock with lower the beta indicates less sensitivity and stock with the negative beta indicates negative sensitive to market. Beta is the index of systematic risk, which can't be reduced by diversification. Beta co-efficient of market is always 1. Here, in this study try to measure by overall NEPSE index. Beta co-efficient gives idea about systematic risk relative to that of market on the other hand beta of particular stock gives the percentage change in the stock return resulting from one percent change in market. Beta co-efficient of the stock can be calculated through the following formula ;

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

Where,

β_j = Beta Co-efficient of jth stock

Cov (R_j, R_m) = Covariance of jth stock with market

$\sigma^2 m$ = Variance of market

In the table no. 4.19, presents the summary of beta co-efficient of each of the sample banks. Detail calculation is shown in appendix no.: C1 to 6.

Table no. 4.19

Summary of beta coefficient of sample Banks

Name of Banks	Value of Beta (β)
Nepal Arab Bank Ltd.	1.24
Nepal Investment Bank Ltd.	0.3787
Standard Chartered Bank Ltd.	0.6306
Himalayan Bank Ltd.	0.8377
Nepal Bangladesh Bank Ltd.	2.22
Everest Bank Ltd.	0.6613

The above table shows, the beta co-efficient of NABIL and NBBL have greater than 1. It indicates that these banks are highly sensitive with market. In other to say these banks are aggressive. Beta coefficient of NIBL, SCBL, HBL and EBL have smaller than 1. It indicates that these banks are less sensitive with market. In other to say the stock of these banks are defensive.

4.8   PARTITIONING RISK:

Systematic risk market risk. It is also called undiversified risk. Systematic risk is caused by the external forces in the environment and those are out of the control of management and company. Such examples of factors are political instability, economic condition, social culture change and technological changes etc. this risk affects all firms in the market. This portion of risk is form of risk premium.

Unsystematic risk is not market related risk. It is also called company specific risk or diversifiable risk. Various factors cause unsystematic variability in the value in the value of common stock, example of such factors are labours strike, new inventions. It is inherent in individual companies or projects. This portion of total risk is diversifiable and it is possible to reduce or eliminate through diversification of investment. The unsystematic risk is not rewarded because it can reduce to zero. Total risk in any security can be partitions into two components i.e. systematic and

unsystematic risk which gives knowledge to the investors what extent the risk of a given stock can be diversified by combining a large number of assets into a portfolio. The risk (systematic and unsystematic) involved with in the common stock shown in table and diagram in the page follow:

Table No. 4.20

Summary various risk involved within the common stock

Name of Banks	Total Risk	Systematic risk (RS)	Unsystematic risk (SR)	Proportion of SR%	Proportion of USR (%)
NABIL	0.4144	0.1637	0.2507	39.5%	60.5%
NIB	0.2968	0.0153	0.2815	5.15%	94.85%
SCB	0.2536	0.0423	0.2113	16.68%	83.32%
HBL	0.2747	0.0747	0.2	27.19%	72.81%
NBB	0.8824	0.5247	0.3577	59.46%	40.54%
EBL	0.2595	0.0466	0.2129	17.96%	82.04%

(Cattail calculation is showin appendex no. D, 1 to 6)

Figure 4.8
TOTAL RISK
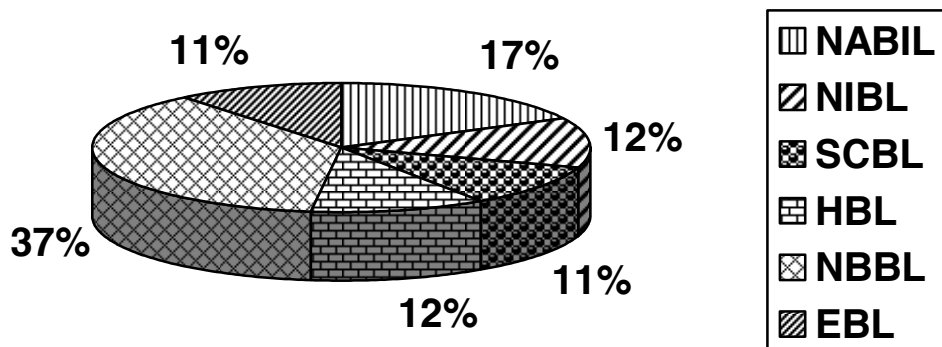
Figure 4.9
SYSTEMATIC RISK

Legend
NABIL
NIBL
SCBL
HBL
NBBL
EBL

5% 19% 2% 5% 9% 60%
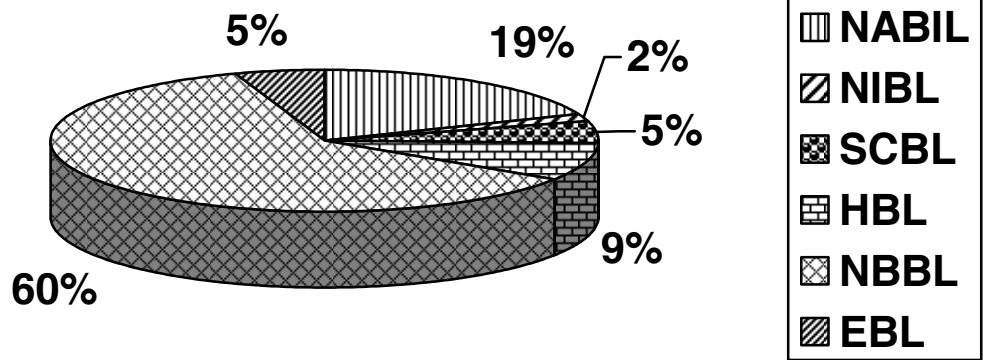
Figure 4.10
UNSYSTEMATIC RISK

Legend
NABIL
NIBL
SCBL
HBL
NBBL
EBL

14% 16% 19% 14% 13% 24%
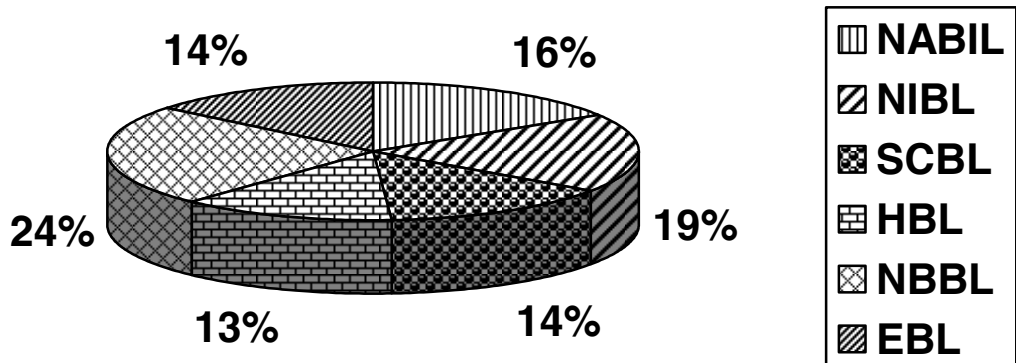
Figure 4.11
PROPORTION OF SYSTEMATIC RISK

NABIL	
NIBL	
SCBL	
HBL	
NBBL	
EBL	
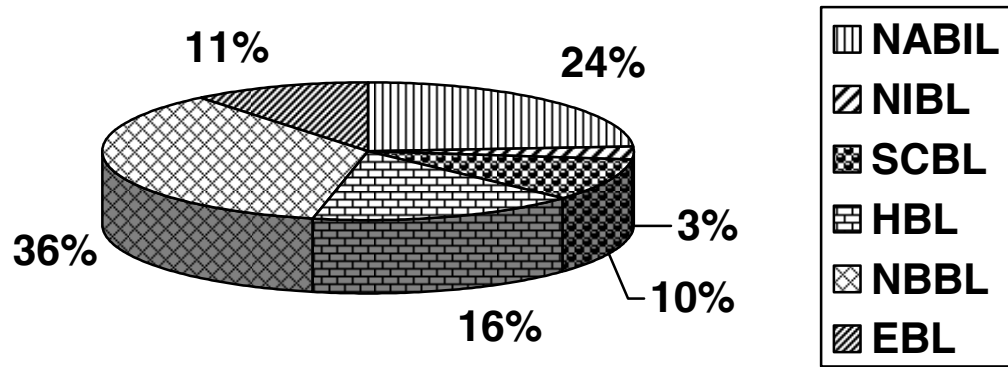
Figure 4.12
PROPORTION OF UNSYSTEMATIC RISK

NABIL	
NIBL	
SCBL	
HBL	
NBBL	
EBL	
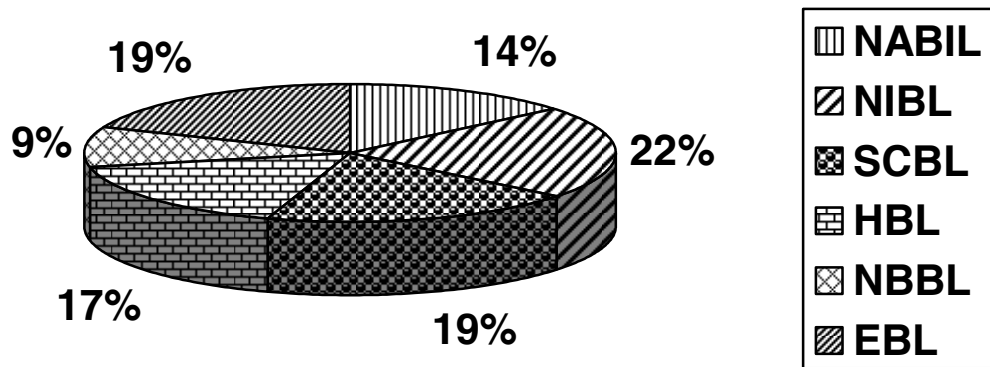
4.9. TESTING OF HYPOTHESIS :

Testing of hypothesis is one of the most important aspects of the theory of decision making. It consists of decision rule required for drawing probabilities inference about the population parameters. In this study, all the common stock in NEPSE is population, which makes overall market return. Sample is common stock of selected commercial banks.

Table No. 4.21
Calculation of t-test

Name of bank	x	$(x - \bar{x})$	$(x - \bar{x})^2$
NABIL	58.96	25.14	632.0196
NIB	23.17	-10.65	113.4225
SCB	38.30	4.48	20.0704
HBL	17.03	-16.79	281.9041
NBB	19.63	-14.19	281.9041
EBL	45.80	11.98	201.3561
	$\sum x = 202.89$	$\sum (x - \bar{x})^2 = 1392.2931$	

Null Hypothesis, Ho= μ = 27.86 i.e. there is no significant difference between the average return on common stock of selected commercial banks and overall market return.

Alternative Hypothesis H1= μ > 27.86 (right tailed test) i.e the average return on common stock of selected commercial bank is greater than overall market return.

Test Statistics : Under H_o, the test Statistics is

$$t = \dfrac{\overline{X} - \mu}{\dfrac{s}{\sqrt{n-1}}}$$

Where,

$$\overline{X} = \dfrac{\sum X}{n}$$

$$= \dfrac{202.89}{6}$$

$$= 33.82$$

$$s = \sqrt{\dfrac{\sum [X - \overline{X}]^2}{n-1}}$$

$$= \sqrt{\dfrac{1392.2931}{6-1}}$$

$$= 16.69$$

$$t = \dfrac{33.82 - 27.86}{\dfrac{16.69}{\sqrt{6-1}}}$$

$$= 0.7985$$

Degree of Freedom (df)   =   n–1

                          =   6-1

                          =   5

$\alpha = 5\% = 0.05$

The tabulated value of t for 5 df at 5% level of significance for right tailed is 2.015 (that is the value of t for 5 df at 10% level of significance for two tailed test.)

Test Result :

Since the calculated value of t is less than tabulated value, the null hypothesis may be accepted. In other words, there is no significant different between average return on common stock of selected commercial bank and overall market return.

CHAPTER-V

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1   SUMMARY :

The study has been focused about the commercial banks on behalf of the risk and "Return Analysis "for common stock issues among other securities. Invests of common stock are ultimate owner of the company, who are ultimately associated with risk and return. Risk and return is an updated concept for modern investment decision which acts as basic foundation of safer investment. Risk and return Analysis should always be address before investment so to maximize the share price, the financial manager must learn to assess two key determinants i.e. risk and return. It become easier when there is existence of developed and healthy stock market.

The common stock is the most risky security than other securities. An investment in common stock of company cannot ensure the annual return and the return on principal. Dividend are paid to the stockholder if there will be earning available to equity shareholders so, the uncertainties of return on common stocks are the facts of the life to the common stockholders.

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

The main objective of these studies is to analyze the risk and return on common stock investment of Nepalese stock market, the study is focused

on common stock of six sample commercial bank which is taken form NEPSE. To analyze and recommend the risk and return Analysis within and between commercial banks and to determinate effect of portfolio risk and return. While analyzing risk and return brief review of related studies has been performed. The secondary data's are collected from NEPSE, security board of Nepal. Journals and concerned banks. The collect secondary data has analyzed by table, graph figure have used to present the data more clearly.

The major findings of the studying are as follows :

From the analysis of risk and return factor of expected rate of return, standard deviation and coefficient of variation of which average value of expected rate of return of the selected commercial banks is 33.82%. EBL, SCBL and NABIL have higher expected rate of return value than average value of expected rate of return. Other remaining Banks have lower expected rate of return value than average value of expected rate of return the average value of standard deviation is 40.21. NABIL and NBBL have higher standard deviation value than average value of standard deviation and other remaining back (NIBL, SCBL, HBL & EBL) have lower standard deviation value than average value of standard deviation. NBBL bank has highest value of C.V. (449.52%). and EBL has lower value of C.V.(56.66%).

For analysis of portfolio risk return of 15 combinations are made from the selected sample banks. The result from the analysis provides verifying degree of portfolio risk and return in each combination. The average value of portfolio risk is 24.30%. 9 combinations of banks have higher portfolio risk than average value of portfolio risk and other remaining combination of banks have lower portfolio risk than average value of portfolio risk. Among them 2 combination of banks have almost near portfolio risk to average value of portfolio risk. Similarly, average portfolio return is

31.77%. 10 combination of banks have higher portfolio return than average value of portfolio return. 4 Combination of banks have lower portfolio return than average value of profit return and 1 combination of bank has lower portfolio return than the average value of portfolio return with negative sign.

To examine the relationship between risk and return, 15 combination are made from the selected 6 sample banks. And these are categorized under

Group A: High risk - High return

Group B: High risk – low return

Group C: High risk – low return with negative sign.

Group A High risk return: There are 11 combinations of banks which average value of portfolio risk is 25.15% and maximum value of portfolio risk is 29.07% (NABIL & NBBL) and minimum value of portfolio risk is 22.37% (NBBL &EBL).

Its average value of portfolio return is 42.21% and maximum value of portfolio return is 80.59% (NABIL &NBBL) and minimum value of portfolio return is 31.71% (SCBL &HBL).

Group B High risk low return : There are 3 combinations and its average value of portfolio risk is 24.36% and maximum value of portfolio risk is 29.62% (NIBL &NBBL) and minimum value of portfolio risk is 19.01%(HBL & NBBL). The average value of portfolio return is 19.67% and maximum value of portfolio return is 23.10% (NIBL & NBBL) and minimum value of portfolio return is 16.25% (HBL & NBBL).

Group C High risk – low return having negative sign: There is only one combination whose portfolio risk is 14.3% and return is 46.7% with negative sign.

And, in the case of portfolio of overall selected sample Bank's common stock have positive correlation.

In this study period, expected market return is 27.86% standard deviation is 32.63% and co-efficient of variation is 1.17 respectively. To analyze the beta co-efficient of sample banks it is found that beta value of NABIL (1.24), NIBL(0.3787), SCBL (0.6306), HBL (0.8378), NBBL (2.22) & EBL (0.6613). Among them beta value NABIL & NBBL is greater than one. It indicates that these banks are more volatile than market and other above listed bank's beta value is less than one. It indicates that these banks are less volatile than market.

In evaluation of risk involved with in common stock, NBBL has maximum value of total risk (0.8824) and SCBL has minimum value of total risk(0.2536). Proportion of systematic risk of NBBL is highest (59.61%) and NIBL is lowest (5.15%). Similarly the proportion of unsystematic risk of NIBL is highest (94.85%) and NBBL is lowest (40.39%).

Testing hypothesis was conducted to test the relationship between overall market rate of return of NEPST and average expected rate of return on common stock of selected sample banks. The result is come there is no significant difference.

5.2   CONCLUSION

Finally the study has concludes some empirical evidence about risk and return analysis in context to Nepalese commercial banks. There is no positive relationship between risk and return. So, investment on banking sectors has more risky than other but also investors are interest to invest their welt in risky asset. The overall effect of portfolio on risk and return shows mixed results. It means making a portfolio we can reduce the risk and increase the return but some case we can not negative level. On the other hand, in all case it helps to reduce the level of risk to some extent.

The returns of some of the banks have high degree of positive co-relation with the return of other banks. It is no beneficial to make portfolio between such banks because the portfolio between highly positively correlated banks may not be able to reduce the level of risk significantly. Two banks are aggressive and these are highly sensitive to market as well as other remaining banks are defensive these banks are less sensitive to market. The average expected rate of return of selected banks and overall market return have positive relationship.

5.3   RECOMMENDATION :

The main objective of the study is to make risk and return analysis of commons stock investment. Basically, the study has been focused on the individual investors who are going to invest their fund on the banking sector. Based on above results, the following recommendation & have been developed.

▪   Investors have to prefer to invest their fund in these sector which provides them a handsome return at minimum risk within a short time period. Therefore, investors must be able to analysis the whole component of stock market and financial condition of various banks. Also be aware of political situation, economic condition and other various factors of the company which affect the price of share.

▪   Investment on common stock is risky job. Investors have to focus their mind not only on return but also on risk. Higher the return higher will be the risk definitely. It does not guarantee return and principal both. Hence, it is risk in the short term investment and investors nee to be prepared for it.

- Most of the Nepalese investors found investing in only single type of common (C.S.) i.e. only on C.S. of NABIL or only on C.S. of SCBL etc. investors need to diversify their fund to reduce the unsystematic risk .It is better to investment making portfolio of more than single assets. For the higher portfolio effect , stock returns with higher expected return and negative correlation should be best .

- Investor should analyze the required rate of return and expected return of the company before going to invest . Depending upon general rule regarding buy and sell, and vice versa.

- The market sensitivity of C.S. also helps to invest the funds .It is better to invest the C.S of beta less than one I.e. defensive stock . But the higher return can't obtain in such investment .

- The financial institutions and companies should provide the real financial statement .The data provided by NEPSE and the company itself are different in some cases .It creates confusion to the possible investor about the actual financial condition of the company .The value of assets and liabilities should not be manipulated by the company to show the under profitability or over profitability.

- Investors have to be clear and be aware about the financial statement of relative company , broker's behavior and attitude , real tendency of NEPSE and rules and regulation of the government investors are required to boost their knowledge up regarding share (common stock) value of the company and share market to get expected return from their investment.

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Nabil Bank Ltd (Appendix: A-1)

Fiscal Year	MPS	DPS	$r = \dfrac{(P_t - P_{t-1}) + D_t}{P_{t-1}}$	r%
2001/02	700	30	-	-
2002/03	740	50	0.1286	12.86
2003/04	1000	65	0.4392	43.92
2004/05	1505	70	0.575	57.5
2005/06	2240	85	0.5449	54.49
2006/07	5050	12.59	1.2601	126.01

Nepal Investment Bank Ltd (Appendix : A-2)

Fiscal Year	MPS	DPS	$r = \dfrac{(P_t - P_{t-1}) + D_t}{P_{t-1}}$	r%
2001/02	760	30	-	-
2002/03	795	20	0.0724	7.24
2003/04	940	15	0.2013	20.13
2004/05	800	12.5	-0.1356	-13.56
2005/06	1260	55.46	0.6443	64.43
2006/07	1729	5	0.3762	37.62

Standard Chartered Bank Ltd (Appendix: A-3)

Fiscal Year	MPS	DPS	$r = \dfrac{(P_t - P_{t-1}) + D_t}{P_{t-1}}$	r%
2001/02	1575	100	-	-
2002/03	1640	120	0.1175	11.75
2003/04	1745	110	0.1311	13.11
2004/05	2345	120	0.4126	41.26
2005/06	3775	140	0.6695	66.95
2006/07	5900	80	0.5841	58.41

Himalayan Bank Ltd (Appendix: A-4)

Fiscal Year	MPS	DPS	$r = \dfrac{(P_t - P_{t-1}) + D_t}{P_{t-1}}$	r%
2001/02	1000	35	-	-
2002/03	836	25	-0.139	-13.9
2003/04	840	20	0.0287	2.87
2004/05	920	31.58	0.1328	13.28
2005/06	1100	35	0.2337	23.37
2006/07	1740	15	0.5955	59.55

Nepal Bangladesh Bank Ltd (Appendix: A-5)

Fiscal Year	MPS	DPS	$r = \dfrac{(P_t - P_{t-1}) + D_t}{P_{t-1}}$	r%
2001/02	490	0	-	-
2002/03	360	0	-0.2653	-26.53
2003/04	354	0	-0.0167	-1.67
2004/05	265	0	-0.2514	-25.14
2005/06	199	0	-0.2491	-24.91
2006/07	550	0	1.7638	176.38

Everest Bank Ltd (Appendix: A-6)

Fiscal Year	MPS	DPS	$r = \dfrac{(P_t - P_{t-1}) + D_t}{P_{t-1}}$	r%
2001/02	405	20		
2002/03	445	0	0.0988	9.88
2003/04	680	0	0.5281	52.81
2004/05	870	20	0.3088	30.88
2005/06	1379	0	0.5851	58.51
2006/07	2430	10	0.7694	76.94

Appendix: B-1

Calculation of portfolio risk and return for NABIL (x) & NIBL (y).

Fiscal Year	r_x	r_y	$r_r - E(r_x)$	$r_y - E(r_y)$	$[r_r - E(r_x)][r_y - E(r_y)]$
2002/03	12.86	7.24	-46.10	-15.93	734.3730
2003/04	43.92	20.13	-15.04	-3.04	45.7216
2004/05	57.5	-13.56	-1.46	-36.73	53.6258
2005/06	54.49	64.43	-4.47	41.26	-184.4322
2006/07	126.01	37.62	67.05	14.45	968.8725

$$\sum[r_r - E(r_x)][r_y - E(r_y)] = 1618.1607$$

$$\text{Cov}(r_x, r_y) = \frac{\sum[r_x - E(r_x)][r_y - E(r_y)]}{n-1}$$

$$= \frac{1618.1607}{5-1}$$

$$= 404.54$$

To minimize the risk the weight of the stock x in the portfolio is given as

$$W_x = \frac{\sigma_y^2 - Cov(r_x, r_y)}{\sigma_x^2 + \sigma_y^2 - 2Cov(r_x, r_y)}$$

$$= \frac{(29.68)^2 - 404.54}{(41.44)^2 + (29.68)^2 - 2 \times 404.54}$$

$$= 0.27$$

We know,

$$W_x + W_y = 1$$

$$0.27 + W_y = 1$$

$$\therefore \quad W_y = 0.73$$

Hence, the portfolio return (r_p) is given as;

$$E(r_p) = W_x. E(r_x) + W_y. E(r_y)$$

$$= 0.27 \times 58.96 + 073 \times 23.17$$

$$= 32.83$$

And, portfolio risk (σ_p) is given as;

$$\sigma_p = \sqrt{W_x^2 . \sigma_x^2 + W_y^2 . \sigma_y^2 + W_x W_y \, \text{Cov}(r_x, r_y)}$$

$$\sqrt{(0.27)^2 \times (41.44)^2 + (0.73)^2 \times (29.68)^2 + 2 \times 0.27 \times 0.73 \times 404.54}$$

$$= 27.46\%$$

The correlation between two stock x and y (ρ_{xy}) is calculation as;

$$P_{xy} = \frac{Cov(r_x, r_y)}{\sigma_x . \sigma_y}$$

$$= \frac{404.54}{41.44 \times 29.68}$$

$$= 0.3289$$

Since, the correlation is positive, the portfolio between NABIL Bank Ltd. and Nepal Investment Bank Ltd. is not be able to reduce its unsystematic risk significantly.

Appendix: B-2

Calculation of portfolio risk and return for NABIL (x) & SCBL (y).

Fiscal Year	r_x	r_y	$r_r - E(r_x)$	$r_y - E(r_y)$	$[r_r - E(r_x)][r_y - E(r_y)]$
2002/03	12.86	11.75	-46.10	-26.55	1223.955
2003/04	43.92	13.11	-15.04	-25.19	378.8576
2004/05	57.5	41.26	-1.46	2.96	-4.3216
2005/06	54.49	66.95	-4.47	28.65	-128.0655
2006/07	126.01	58.41	67.05	20.11	1348.3755
				$\sum[r_r - E(r_x)][r_y - E(r_y)] =$	**2818.801**

$$\text{Cov}(r_x, r_y) = \frac{\sum[r_x - E(r_x)][r_y - E(r_y)]}{n-1}$$

$$= \frac{2818.801}{5-1}$$

$$= 704.70$$

To minimize the risk the weight of the stock x in the portfolio is given as

$$W_x = \frac{\sigma_y^2 - Cov(r_x, r_y)}{\sigma_x^2 + \sigma_y^2 - 2Cov(r_x, r_y)}$$

$$= \frac{(25.36)^2 - 704.70}{(41.44)^2 + (25.36)^2 - 2 \times 704.70}$$

$$= -0.06$$

We know,

$$W_x + W_y = 1$$

$$\therefore \quad W_y = 1.06$$

Hence, the portfolio return (r_p) is given as;

$$E(r_p) = W_x . E(r_x) + W_y . E(r_y)$$

$$= (-0.06) \times 58.96 + 1.06 \times 38.3$$

$$= 37.06$$

And, portfolio risk (σ_p) is given as;

$$\sigma_p = \sqrt{W_x^2 . \sigma_x^2 + W_y^2 . \sigma_y^2 + W_x W_y \, \text{Cov}(r_x, r_y)}$$

$$= \sqrt{(-0.06)^2 \times (41.44)^2 + (1.06)^2 \times (25.36)^2 + 2 \times (-0.06) \times 1.06 \times 704.70}$$

$$= 25.28\%$$

The correlation between two stock x and y (ρ_{xy}) is calculation as;

$$P_{xy} = \frac{Cov(r_x, r_y)}{\sigma_x . \sigma_y}$$

$$= \frac{704.70}{41.44 \times 25.36}$$

$$= 0.6706$$

Since, the correlation is positive, the portfolio between NABIL Bank Ltd. and Standard Chartered Bank Ltd. is not be able to reduce its unsystematic risk significantly.

Appendix: B-3

Calculation of portfolio risk and return for NABIL (x) & HBL (y).

Fiscal Year	r_x	r_y	$r_r - E(r_x)$	$r_y - E(r_y)$	$[r_r - E(r_x)][r_y - E(r_y)]$
2002/03	12.86	-13.90	-46.10	-30.93	1425.873
2003/04	43.92	2.87	-15.04	-14.16	212.9664
2004/05	57.5	13.28	-1.46	-3.75	5.475
2005/06	54.49	23.37	-4.47	6.34	-28.3398
2006/07	126.01	59.55	67.05	42.52	2850.966

$$\sum[r_r - E(r_x)][r_y - E(r_y)] = 4466.9406$$

$$Cov(r_x, r_y) = \frac{\sum[r_x - E(r_x)][r_y - E(r_y)]}{n-1}$$

$$= \frac{4466.9406}{5-1}$$

$$= 1116.74$$

To minimize the risk the weight of the stock x in the portfolio is given as

$$W_x = \frac{\sigma_y^2 - Cov(r_x, r_y)}{\sigma_x^2 + \sigma_y^2 - 2Cov(r_x, r_y)}$$

$$= \frac{(27.47)^2 - 1116.74}{(41.44)^2 + (27.47)^2 - 2 \times 1116.74}$$

$$= -1.52$$

We know,

$$W_x + W_y = 1$$

$$\therefore W_y = 2.52$$

Hence, the portfolio return (r_p) is given as;

$$E(r_p) = W_x. E(r_x) + W_y. E(r_y)$$

$$= (-1.52)x\ 58.96 + 2.52\ x\ 17.03$$

$$= -46.70$$

And, portfolio risk (σ_p) is given as;

$$\sigma_p = \sqrt{W_x^2. \sigma_x^2 + W_y^2. \sigma_y^2 + W_x W_y\ Cov(r_x, r_y)}$$

$$= \sqrt{(-1.52)^2 \times (41.44)^2 + (2.52)^2 \times (27.47)^2 + 2 \times (-1.52) \times 2.52 \times 1116.74}$$

$$= 14.30\%$$

The correlation between two stock x and y (ρ_{xy}) is calculation as;

$$P_{xy} = \frac{Cov(r_x, r_y)}{\sigma_x. \sigma_y}$$

$$= \frac{1116.74}{41.44 \times 27.47}$$

$$= 0.9810$$

Since, the correlation is positive, the portfolio between NABIL Bank Ltd. and Himalayan Bank Ltd. is not be able to reduce its unsystematic risk significantly.

Appendix: B-4

Calculation of portfolio risk and return for NABIL (x) & NBBL (y).

Fiscal Year	r_x	r_y	$r_r - E(r_x)$	$r_y - E(r_y)$	$[r_r - E(r_x)][r_y - E(r_y)]$
2002/03	12.86	-26.53	-46.10	-46.16	2127.976
2003/04	43.92	-1.67	-15.04	-21.30	320.352
2004/05	57.5	-25.14	-1.46	-44.77	65.3642
2005/06	54.49	-24.91	-4.47	-44.54	199.0938
2006/07	126.01	176.38	67.05	156.75	10510.0875

$$\sum [r_r - E(r_x)][r_y - E(r_y)] = \mathbf{13222.8735}$$

$$\text{Cov}(r_x, r_y) = \frac{\sum [r_x - E(r_x)][r_y - E(r_y)]}{n-1}$$

$$= \frac{13222.8735}{5-1}$$

$$= 3305.72$$

To minimize the risk the weight of the stock x in the portfolio is given as

$$W_x = \frac{\sigma_y^2 - Cov(r_x, r_y)}{\sigma_x^2 + \sigma_y^2 - 2Cov(r_x, r_y)}$$

$$= \frac{(88.24)^2 - 3305.72}{(41.44)^2 + (88.24)^2 - 2 \times 3305.72}$$

$$= 1.55$$

We know,

$$W_x + W_y = 1$$

$$\therefore W_y = -0.55$$

Hence, the portfolio return (r_p) is given as;

$$
\begin{aligned}
E(r_p) &= W_x . E(r_x) + W_y . E(r_y) \\
&= 1.55 \times 58.96 + (-0.55) \times 19.63 \\
&= 80.59
\end{aligned}
$$

And, portfolio risk (σ_p) is given as;

$$\sigma_p = \sqrt{W_x^2 . \sigma_x^2 + W_y^2 . \sigma_y^2 + W_x W_y \, \text{Cov}(r_x, r_y)}$$

$$= \sqrt{(1.55)^2 \times (41.44)^2 + (-0.55)^2 \times (88.24)^2 + 2 \times 1.55 \times (-0.55) \times 3305.72}$$

$$= 29.07\%$$

The correlation between two stock x and y (ρ_{xy}) is calculation as;

$$P_{xy} = \frac{Cov(r_x, r_y)}{\sigma_x . \sigma_y}$$

$$= \frac{3305.72}{41.44 \times 88.24}$$

$$= 0.9040$$

Since, the correlation is positive, the portfolio between NABIL Bank Ltd. and Nepal Bangladesh Bank Ltd. is not be able to reduce its unsystematic risk significantly.

Appendix: B-5

Calculation of portfolio risk and return for NABIL (x) & EBL (y).

Fiscal Year	r_x	r_y	$r_r - E(r_x)$	$r_y - E(r_y)$	$[r_r - E(r_x)][r_y - E(r_y)]$
2002/03	12.86	9.88	-46.10	-35.92	1655.912
2003/04	43.92	52.81	-15.04	7.01	-105.4304
2004/05	57.5	30.88	-1.46	-14.92	21.7832
2005/06	54.49	58.51	-4.47	12.71	-56.8137
2006/07	126.01	76.94	67.05	31.14	2087.937

$$\sum[r_r - E(r_x)][r_y - E(r_y)] = \mathbf{3603.3881}$$

$$Cov(r_X, r_Y) = \frac{\sum[r_X - E(r_X)][r_Y - E(r_Y)]}{n-1}$$

$$= \frac{3606.3881}{5-1}$$

$$= 900.85$$

To minimize the risk the weight of the stock x in the portfolio is given as

$$W_x = \frac{\sigma_y^2 - Cov(r_x, r_y)}{\sigma_x^2 + \sigma_y^2 - 2Cov(r_x, r_y)}$$

$$= \frac{(25.95)^2 - 900.85}{(41.44)^2 + (25.95)^2 - 2\times 900.85}$$

$$= -0.39$$

We know,

$W_x + W_y = 1$

$\therefore W_y = 1.39$

Hence, the portfolio return (r_p) is given as;

$E(r_p)$ = $W_x . E(r_x) + W_y . E(r_y)$

  = -0.39x 58.96 + 1.39 x 45.8

  = 40.67

And, portfolio risk (σ_p) is given as;

$$\sigma_p = \sqrt{W_x^2 . \sigma_x^2 + W_y^2 . \sigma_y^2 + W_x W_y \, Cov(r_x, r_y)}$$

$$= \sqrt{(-0.39)^2 \times (41.44)^2 + (1.39)^2 \times (25.95)^2 + 2\times(-0.39)\times 1.39 \times 900.85}$$

$$= 24.20\%$$

The correlation between two stock x and y (ρ_{xy}) is calculation as;

$$P_{xy} = \frac{Cov(r_X, r_Y)}{\sigma_X . \sigma_y}$$

$$= \frac{900.85}{41.44 \times 25.95}$$

$$= 0.8377$$

Since, the correlation is positive, the portfolio between NABIL Bank Ltd. and Everest Bank Ltd. is not be able to reduce its unsystematic risk significantly.

Appendix: B-6

Calculation of portfolio risk and return for NIBL (x) & SCBL (y).

Fiscal Year	r_x	r_y	$r_r - E(r_x)$	$r_y - E(r_y)$	$[r_r - E(r_x)][r_y - E(r_y)]$
2002/03	7.24	11.75	-15.93	-26.55	422.9415
2003/04	20.13	13.11	-3.04	-25.19	76.5776
2004/05	-13.56	41.26	-36.73	2.96	-108.7208
2005/06	64.43	66.95	41.26	28.65	1182.099
2006/07	37.62	58.41	14.45	20.11	290.5895
					$\sum[r_r - E(r_x)][r_y - E(r_y)] = 1863.4868$

$$\text{Cov}(r_X, r_y) = \frac{\sum[r_X - E(r_X)][r_y - E(r_y)]}{n-1}$$

$$= \frac{1863.4868}{5-1}$$

$$= 465.87$$

To minimize the risk the weight of the stock x in the portfolio is given as

$$W_x = \frac{\sigma_y^2 - Cov(r_x, r_y)}{\sigma_x^2 + \sigma_y^2 - 2Cov(r_x, r_y)}$$

$$= \frac{(25.36)^2 - 465.87}{(29.68)^2 + (25.36)^2 - 2 \times 465.87}$$

$$= 0.3$$

We know,

$$W_x + W_y = 1$$

$$\therefore W_y = 0.7$$

Hence, the portfolio return (r_p) is given as;

$$E(r_p) = W_x . E(r_x) + W_y . E(r_y)$$

$$= 0.3 \times 23.17 + 0.7 \times 38.3$$

$$= 33.76$$

And, portfolio risk (σ_p) is given as;

$$\sigma_p = \sqrt{W_x^2 . \sigma_x^2 + W_y^2 . \sigma_y^2 + W_x W_y \text{Cov}(r_x, r_y)}$$

$$= \sqrt{(0.3)^2 \times (29.68)^2 + (0.7)^2 \times (25.36)^2 + 2 \times 0.3 \times 0.7 \times 465.87}$$

$$= 24.29\%$$

The correlation between two stock x and y (ρ_{xy}) is calculation as;

$$P_{xy} = \frac{Cov(r_x, r_y)}{\sigma_x . \sigma_y}$$

$$= \frac{465.87}{29.68 \times 25.36}$$

$$= 0.6189$$

Since, the correlation is positive, the portfolio between Nepal Investment Bank Ltd. and Standard Chartered Bank Ltd. is not be able to reduce its unsystematic risk significantly.

Appendix: B-7

Calculation of portfolio risk and return for NIBL (x) & HBL (y).

Fiscal Year	r_x	r_y	$r_r - E(r_x)$	$r_y - E(r_y)$	$[r_r - E(r_x)][r_y - E(r_y)]$
2002/03	7.24	-13.90	-15.93	-30.93	492.7149
2003/04	20.13	2.87	-3.04	-14.16	43.0464
2004/05	-13.56	13.28	-36.73	-3.75	137.7375
2005/06	64.43	23.37	41.26	6.34	261.5884
2006/07	37.62	59.55	14.45	42.52	614.414

$$\sum[r_r - E(r_x)][r_y - E(r_y)] = 1549.5012$$

$$Cov(r_x, r_y) = \frac{\sum[r_x - E(r_x)][r_y - E(r_y)]}{n-1}$$

$$= \frac{1549.5012}{5-1}$$

$$= 387.38$$

To minimize the risk the weight of the stock x in the portfolio is given as

$$W_x = \frac{\sigma_y^2 - Cov(r_x, r_y)}{\sigma_x^2 + \sigma_y^2 - 2Cov(r_x, r_y)}$$

$$= \frac{(27.47)^2 - 387.38}{(29.68)^2 + (27.47)^2 - 2 \times 387.38}$$

$$= 0.43$$

We know,

$$W_x + W_y = 1$$

$$\therefore W_y = 0.57$$

Hence, the portfolio return (r_p) is given as;

$$E(r_p) = W_x. E(r_x) + W_y. E(r_y)$$

$$= 0.43 \times 23.17 + 0.57 \times 17.03$$

$$= 19.67$$

And, portfolio risk (σ_p) is given as;

$$\sigma_p = \sqrt{W_x^2.\sigma_x^2 + W_y^2.\sigma_y^2 + W_x W_y Cov(r_x, r_y)}$$

$$= \sqrt{(0.43)^2 \times (29.68)^2 + (0.57)^2 \times (27.47)^2 + 2 \times 0.43 \times 0.57 \times 387.38}$$

$$= 24.45\%$$

The correlation between two stock x and y (ρ_{xy}) is calculation as;

$$P_{xy} = \frac{Cov(r_x, r_y)}{\sigma_x . \sigma_y}$$

$$= \frac{387.38}{29.68 \times 27.47}$$

$$= 0.4751$$

Since, the correlation is positive, the portfolio between Nepal Investment Bank Ltd. and Himalayan Bank Ltd. is not be able to reduce its unsystematic risk significantly.

Appendix: B-8

Calculation of portfolio risk and return for NIBL (x) &NBBL (y).

Fiscal Year	r_x	r_y	$r_r - E(r_x)$	$r_y - E(r_y)$	$[r_r - E(r_x)][r_y - E(r_y)]$
2002/03	7.24	-26.53	-15.93	-46.16	735.3288
2003/04	20.13	-1.67	-3.04	-21.30	64.752
2004/05	-13.56	-25.14	-36.73	-44.77	1644.4021
2005/06	64.43	-24.91	41.26	-44.54	-1837.7204
2006/07	37.62	176.38	14.45	156.75	2265.0375

$$\sum [r_r - E(r_x)][r_y - E(r_y)] = 2871.8$$

$$Cov(r_x, r_y) = \frac{\sum [r_x - E(r_x)][r_y - E(r_y)]}{n-1}$$

$$= \frac{2871.8}{5-1}$$

$$= 717.95$$

To minimize the risk the weight of the stock x in the portfolio is given as

$$W_x = \frac{\sigma_y^2 - Cov(r_x, r_y)}{\sigma_x^2 + \sigma_y^2 - 2Cov(r_x, r_y)}$$

$$= \frac{(88.24)^2 - 717.95}{(29.68)^2 + (88.24)^2 - 2 \times 717.95}$$

$$= 0.98$$

We know,

$W_x + W_y = 1$

$\therefore W_y = 0.02$

Hence, the portfolio return (r_p) is given as;

$$E(r_p) = W_x . E(r_x) + W_y . E(r_y)$$

$$= 0.98 \times 23.17 + 0.02 \times 19.63$$

$$= 23.10$$

And, portfolio risk (σ_p) is given as;

$$\sigma_p = \sqrt{W_x^2 . \sigma_x^2 + W_y^2 . \sigma_y^2 + W_x W_y \, Cov(r_x, r_y)}$$

$$= \sqrt{(0.98)^2 \times (29.68)^2 + (0.02)^2 \times (88.24)^2 + 2 \times 0.98 \times 0.02 \times 717.95}$$

$$= 29.62\%$$

The correlation between two stock x and y (ρ_{xy}) is calculation as;

$$P_{xy} = \frac{Cov(r_x, r_y)}{\sigma_x . \sigma_y}$$

$$= \frac{717.95}{29.68 \times 88.24}$$

$$= 0.2741$$

Since, the correlation is positive, the portfolio between Nepal Investment Bank Ltd. and Nepal Bangladesh Bank Ltd. is not be able to reduce its unsystematic risk significantly.

Appendix: B-9

Calculation of portfolio risk and return for NIBL (x) & EBL (y).

Fiscal Year	r_x	r_y	$r_r - E(r_x)$	$r_y - E(r_y)$	$[r_r - E(r_x)][r_y - E(r_y)]$
2002/03	7.24	9.88	-15.93	-35.92	572.2056
2003/04	20.13	52.81	-3.04	7.01	-21.3104
2004/05	-13.56	30.88	-36.73	-14.92	548.0116
2005/06	64.43	58.51	41.26	12.71	524.4146
2006/07	37.62	76.94	14.45	31.14	449.973

$$\sum [r_r - E(r_x)][r_y - E(r_y)] = 2073.2944$$

$$Cov(r_x, r_y) = \frac{\sum [r_x - E(r_x)][r_y - E(r_y)]}{n-1}$$

$$= \frac{2073.2944}{5-1}$$

$$= 518.32$$

To minimize the risk the weight of the stock x in the portfolio is given as

$$W_x = \frac{\sigma_y^2 - Cov(r_x, r_y)}{\sigma_x^2 + \sigma_y^2 - 2Cov(r_x, r_y)}$$

$$= \frac{(25.95)^2 - 518.32}{(29.68)^2 + (25.95)^2 - 2 \times 518.32}$$

$$= 0.3$$

We know,

$$W_x + W_y = 1$$

$$\therefore W_y = 0.7$$

Hence, the portfolio return (r_p) is given as;

$$E(r_p) = W_x . E(r_x) + W_y . E(r_y)$$

$$= 0.3 \times 23.17 + 0.7 \times 45.8$$

$$= 39.01$$

And, portfolio risk (σ_p) is given as;

$$\sigma_p = \sqrt{W_x^2 . \sigma_x^2 + W_y^2 . \sigma_y^2 + W_x W_y Cov(r_x, r_y)}$$

$$= \sqrt{(0.3)^2 \times (29.68)^2 + (0.7)^2 \times (25.95)^2 + 2 \times 0.3 \times 0.7 \times 518.32}$$

$$= 25.04\%$$

The correlation between two stock x and y (ρ_{xy}) is calculation as;

$$P_{xy} = \frac{Cov(r_x, r_y)}{\sigma_x . \sigma_y}$$

$$= \frac{518.32}{29.68 \times 25.95}$$

$$= 0.6730$$

Since, the correlation is positive, the portfolio between Nepal Investment Bank Ltd. and Everest Bank Ltd. is not be able to reduce its unsystematic risk significantly.

Appendix: B-10
Calculation of portfolio risk and return for SCBL (x) & HBL (y).

Fiscal Year	r_x	r_y	$r_r - E(r_x)$	$r_y - E(r_y)$	$[r_r - E(r_x)][r_y - E(r_y)]$
2002/03	11.75	-13.90	-26.55	-30.93	821.1915
2003/04	13.11	2.87	-25.19	-14.16	356.6904
2004/05	41.26	13.28	2.96	-3.75	-11.1
2005/06	66.95	23.37	28.65	6.34	181.641
2006/07	58.41	59.55	20.11	42.52	855.0772
					$\sum[r_r - E(r_x)][r_y - E(r_y)] = \mathbf{2203.5001}$

$$Cov(r_x, r_y) = \frac{\sum[r_x - E(r_x)][r_y - E(r_y)]}{n-1}$$

$$= \frac{2203.5001}{5-1}$$

$$= 550.88$$

To minimize the risk the weight of the stock x in the portfolio is given as

$$W_x = \frac{\sigma_y^2 - Cov(r_x, r_y)}{\sigma_x^2 + \sigma_y^2 - 2Cov(r_x, r_y)}$$

$$= \frac{(27.47)^2 - 550.88}{(25.36)^2 + (27.47)^2 - 2 \times 550.88}$$

$$= 0.69$$

We know,

$$W_x + W_y = 1$$

$$\therefore W_y = 0.31$$

Hence, the portfolio return (r_p) is given as;

$$E(r_p) = W_x . E(r_x) + W_y . E(r_y)$$

$$= 0.69 \times 38.3 + 0.31 \times 17.03$$

$$= 31.71$$

And, portfolio risk (σ_p) is given as;

$$\sigma_p = \sqrt{W_x^2 . \sigma_x^2 + W_y^2 . \sigma_y^2 + W_x W_y \, Cov(r_x, r_y)}$$

$$= \sqrt{(0.69)^2 \times (25.36)^2 + (0.31)^2 \times (27.47)^2 + 2 \times 0.69 \times 0.31 \times 550.88}$$

$$= 24.79\%$$

The correlation between two stock x and y (ρ_{xy}) is calculation as;

$$P_{xy} = \frac{Cov(r_x, r_y)}{\sigma_x . \sigma_y}$$

$$= \frac{550.88}{25.36 \times 27.47}$$

$$= 0.7908$$

Since, the correlation is positive, the portfolio between Standard Chartered Bank Ltd. and Himalayan Bank Ltd. is not be able to reduce its unsystematic risk significantly.

Appendix: B-11

Calculation of portfolio risk and return for SCBL (x) & NBBL (y).

Fiscal Year	r_x	r_y	$r_r - E(r_x)$	$r_y - E(r_y)$	$[r_r - E(r_x)][r_y - E(r_y)]$
2002/03	11.75	-26.53	-26.55	-46.16	1225.548
2003/04	13.11	-1.67	-25.19	-21.30	536.547
2004/05	41.26	-25.14	2.96	-44.77	-132.5192
2005/06	66.95	-24.91	28.65	-44.54	-1276.071
2006/07	58.41	176.38	20.11	156.75	3152.2425

$$\sum[r_r - E(r_x)][r_y - E(r_y)] = 3505.7473$$

$$Cov(r_x, r_y) = \frac{\sum[r_x - E(r_x)][r_y - E(r_y)]}{n-1}$$

$$= \frac{3505.7473}{5-1}$$

$$= 876.44$$

To minimize the risk the weight of the stock x in the portfolio is given as

$$W_x = \frac{\sigma_y^2 - Cov(r_x, r_y)}{\sigma_x^2 + \sigma_y^2 - 2Cov(r_x, r_y)}$$

$$= \frac{(88.24)^2 - 876.44}{(25.36)^2 + (88.24)^2 - 2 \times 876.44}$$

$$= 1.03$$

We know,

$$W_x + W_y = 1$$

$$\therefore W_y = -0.03$$

Hence, the portfolio return (r_p) is given as;

$$E(r_p) = W_x. E(r_x) + W_y. E(r_y)$$

$$= 1.03 \times 38.3 + (-0.03) \times 19.63$$

$$= 38.86$$

And, portfolio risk (σ_p) is given as;

$$\sigma_p = \sqrt{W_x^2 . \sigma_x^2 + W_y^2 . \sigma_y^2 + W_x W_y\, Cov(r_x, r_y)}$$

$$= \sqrt{(1.03)^2 \times (25.36)^2 + (-0.03)^2 \times (88.24)^2 + 2 \times 1.03 \times (-0.03) \times 876.44}$$

$$= 25.20\%$$

The correlation between two stock x and y (ρ_{xy}) is calculation as;

$$P_{xy} = \frac{Cov(r_x, r_y)}{\sigma_x . \sigma_y}$$

$$= \frac{876.44}{25.36 \times 88.24}$$

$$= 0.3917$$

Since, the correlation is positive, the portfolio between Standard Chartered Bank Ltd. and Nepal Bangladesh Bank Ltd. is not be able to reduce its unsystematic risk significantly.

Appendix: B-12

Calculation of portfolio risk and return for SCBL (x) & EBL (y).

Fiscal Year	r_x	r_y	$r_r - E(r_x)$	$r_y - E(r_y)$	$[r_r - E(r_x)][r_y - E(r_y)]$
2002/03	11.75	9.88	-26.55	-35.92	953.676
2003/04	13.11	52.81	-25.19	7.01	-176.5819
2004/05	41.26	30.88	2.96	-14.92	-44.1632
2005/06	66.95	58.51	28.65	12.71	364.1415
2006/07	58.41	76.94	20.11	31.14	626.2254
					$\sum[r_r - E(r_x)][r_y - E(r_y)] = 1723.2978$

$$\text{Cov}(r_x, r_y) = \frac{\sum[r_x - E(r_x)][r_y - E(r_y)]}{n-1}$$

$$= \frac{1723.2978}{5-1}$$

$$= 430.82$$

To minimize the risk the weight of the stock x in the portfolio is given as

$$W_x = \frac{\sigma_y^2 - Cov(r_x, r_y)}{\sigma_x^2 + \sigma_y^2 - 2Cov(r_x, r_y)}$$

$$= \frac{(25.95)^2 - 430.82}{(25.36)^2 + (25.95)^2 - 2 \times 430.82}$$

$$= 0.53$$

We know,

$$W_x + W_y = 1$$

$$\therefore W_y = 0.47$$

Hence, the portfolio return (r_p) is given as;

$$E(r_p) = W_x . E(r_x) + W_y . E(r_y)$$

$$= 0.53 \times 38.3 + 0.47 \times 45.8$$

$$= 41.83$$

And, portfolio risk (σ_p) is given as;

$$\sigma_p = \sqrt{W_x^2 . \sigma_x^2 + W_y^2 . \sigma_y^2 + W_x W_y \, \text{Cov}(r_x, r_y)}$$

$$= \sqrt{(0.53)^2 \times (25.36)^2 + (0.47)^2 \times (25.95)^2 + 2 \times 0.53 \times 0.47 \times 430.82}$$

$$= 23.32\%$$

The correlation between two stock x and y (ρ_{xy}) is calculation as;

$$P_{xy} = \frac{Cov(r_x, r_y)}{\sigma_x . \sigma_y}$$

$$= \frac{430.82}{25.36 \times 25.95}$$

$$= 0.6547$$

Since, the correlation is positive, the portfolio between Standard Chartered Bank Ltd. and Everest Bank Ltd. is not be able to reduce its unsystematic risk significantly.

Appendix: B-13
Calculation of portfolio risk and return for HBL (x) & NBBL (y).

Fiscal Year	r_x	r_y	$r_r - E(r_x)$	$r_y - E(r_y)$	$[r_r - E(r_x)][r_y - E(r_y)]$
2002/03	-13.90	-26.53	-30.93	-46.16	1427.7288
2003/04	2.87	-1.67	-14.16	-21.30	301.608
2004/05	13.28	-25.14	-3.75	-44.77	167.8875
2005/06	23.37	-24.91	6.34	-44.54	-282.3836
2006/07	59.55	176.38	42.52	156.75	6665.01

$$\sum [r_r - E(r_x)][r_y - E(r_y)] = 8279.8507$$

$$Cov\,(r_x, r_y) = \frac{\sum [r_x - E(r_x)][r_y - E(r_y)]}{n-1}$$

$$= \frac{8279.8507}{5-1}$$

$$= 2069.96$$

To minimize the risk the weight of the stock x in the portfolio is given as

$$W_x = \frac{\sigma_y{}^2 - Cov(r_x, r_y)}{\sigma_x{}^2 + \sigma_y{}^2 - 2Cov(r_x, r_y)}$$

$$= \frac{(88.24)^2 - 2069.96}{(27.47)^2 + (88.24)^2 - 2 \times 2069.96}$$

$$= 1.30$$

We know,

$$W_x + W_y = 1$$

$$\therefore W_y = -0.30$$

Hence, the portfolio return (r_p) is given as;

$$
\begin{aligned}
E(r_p) &= W_x . E(r_x) + W_y . E(r_y) \\
&= 1.30 \times 17.03 + (-0.30) \times 19.63 \\
&= 16.25
\end{aligned}
$$

And, portfolio risk (σ_p) is given as;

$$\sigma_p = \sqrt{W_x{}^2 . \sigma_x{}^2 + W_y{}^2 . \sigma_y{}^2 + W_x W_y\, Cov\,(r_x, r_y)}$$

$$= \sqrt{(1.30)^2 \times (27.47)^2 + (-0.30)^2 \times (88.24)^2 + 2 \times 1.30 \times (-0.30) \times 2069.96}$$

$$= 19.01\%$$

The correlation between two stock x and y (ρ_{xy}) is calculation as;

$$P_{xy} = \frac{Cov(r_x, r_y)}{\sigma_x . \sigma_y}$$

$$= \frac{2069.96}{27.47 \times 88.24}$$

$$= 0.8540$$

Since, the correlation is positive, the portfolio between Himalayan Bank Ltd. and Nepal Bangladesh Bank Ltd. is not be able to reduce its unsystematic risk significantly.

Appendix: B-14

Calculation of portfolio risk and return for HBL (x) & EBL (y).

Fiscal Year	r_x	r_y	$r_r - E(r_x)$	$r_y - E(r_y)$	$[r_r - E(r_x)][r_y - E(r_y)]$
2002/03	-13.90	9.88	-30.93	-35.92	1111.0056
2003/04	2.87	52.81	-14.16	7.01	-99.2616
2004/05	13.28	30.88	-3.75	-14.92	55.95
2005/06	23.37	58.51	6.34	12.71	80.5814
2006/07	59.55	76.94	42.52	31.14	1324.0728

$$\Sigma[r_r - E(r_x)][r_y - E(r_y)] = 2472.3482$$

$$Cov(r_x, r_y) = \frac{\Sigma[r_x - E(r_x)][r_y - E(r_y)]}{n-1}$$

$$= \frac{2472.3482}{5-1}$$

$$= 618.09$$

To minimize the risk the weight of the stock x in the portfolio is given as

$$W_x = \frac{\sigma_y^2 - Cov(r_x, r_y)}{\sigma_x^2 + \sigma_y^2 - 2Cov(r_x, r_y)}$$

$$= \frac{(25.95)^2 - 618.09}{(27.47)^2 + (25.95)^2 - 2 \times 618.09}$$

$$= 0.29$$

We know,

$$W_x + W_y = 1$$

$$\therefore W_y = 0.71$$

Hence, the portfolio return (r_p) is given as;

$$E(r_p) = W_x. E(r_x) + W_y. E(r_y)$$

$$= 0.29 \times 17.03 + 0.71 \times 45.8$$

$$= 37.46$$

And, portfolio risk (σ_p) is given as;

$$\sigma_p = \sqrt{W_x^2 . \sigma_x^2 + W_y^2 . \sigma_y^2 + W_x W_y Cov(r_x, r_y)}$$

$$= \sqrt{(0.29)^2 \times (27.47)^2 + (0.71)^2 \times (25.95)^2 + 2 \times 0.29 \times 0.71 \times 618.09}$$

$$= 25.64\%$$

The correlation between two stock x and y (ρ_{xy}) is calculation as;

$$P_{xy} = \frac{Cov(r_x, r_y)}{\sigma_x . \sigma_y}$$

$$= \frac{618.09}{27.47 \times 25.95}$$

$$= 0.8671$$

Since, the correlation is positive, the portfolio between Himalayan Bank Ltd. and Everest Bank Ltd. is not be able to reduce its unsystematic risk significantly.

Appendix: B-15

Calculation of portfolio risk and return for NBBL (x) & EBL (y).

Fiscal Year	r_x	r_y	$r_r - E(r_x)$	$r_y - E(r_y)$	$[r_r - E(r_x)][r_y - E(r_y)]$
2002/03	-26.53	9.88	-46.16	-35.92	1658.0672
2003/04	-1.67	52.81	-21.30	7.01	-149.313
2004/05	-25.14	30.88	-44.77	-14.92	667.9684
2005/06	-24.91	58.51	-44.54	12.71	-566.1034
2006/07	176.38	76.94	156.75	31.14	4881.195

$$\sum[r_r - E(r_x)][r_y - E(r_y)] = 6491.8142$$

$$\text{Cov}(r_x, r_y) = \frac{\sum[r_x - E(r_x)][r_y - E(r_y)]}{n-1}$$

$$= \frac{6491.8142}{5-1}$$

$$= 1622.95$$

To minimize the risk the weight of the stock x in the portfolio is given as

$$W_x = \frac{\sigma_y^2 - Cov(r_x, r_y)}{\sigma_x^2 + \sigma_y^2 - 2Cov(r_x, r_y)}$$

$$= \frac{(25.95)^2 - 1622.95}{(88.24)^2 + (25.95)^2 - 2 \times 1622.95}$$

$$= -0.18$$

We know,

$$W_x + W_y = 1$$

$$\therefore W_y = 1.18$$

Hence, the portfolio return (r_p) is given as;

$$
\begin{aligned}
E(r_p) &= W_x.E(r_x) + W_y.E(r_y) \\
&= (-0.18) \times 19.63 + 1.18 \times 45.8 \\
&= 50.51
\end{aligned}
$$

And, portfolio risk (σ_p) is given as;

$$\sigma_p = \sqrt{W_x^2.\sigma_x^2 + W_y^2.\sigma_y^2 + W_x W_y \, \text{Cov}(r_x, r_y)}$$

$$= \sqrt{(-0.18)^2 \times (88.24)^2 + (1.18)^2 \times (25.95)^2 + 2 \times (-0.18) \times 1.18 \times 1622.95}$$

$$= 22.37\%$$

The correlation between two stock x and y (ρ_{xy}) is calculation as;

$$P_{xy} = \frac{\text{Cov}(r_x, r_y)}{\sigma_x.\sigma_y}$$

$$= \frac{1622.95}{88.24 \times 25.95}$$

$$= 0.7088$$

Since, the correlation is positive, the portfolio between Nepal Bangladesh Bank Ltd. and Everest Bank Ltd. is not be able to reduce its unsystematic risk significantly.

Appendix: C-1

Calculation of Beta coefficient of NABIL Bank Ltd.(x)

Fiscal Year	$r_r - E(r_x)$	$r_m - E(r_m)$	$[r_r - E(r_x)][r_m - E(r_m)]$
2002/03	-46.10	-37.79	1742.119
2003/04	-15.04	-19.51	293.4304
2004/05	-1.46	1.28	-1.8688
2005/06	-4.47	7.05	-31.5135
2006/07	67.05	48.98	3284.109
			$\sum[r_x - E(r_x)][r_m - E(r_m)] = 5286.2761$

$$COV(r_x r_m) = \frac{\sum[r_x - E(r_x)][r_m - E(r_m)]}{n-1}$$

$$= \frac{5286.2761}{5-1}$$

$$= 1321.57$$

$$Beta(\beta_x) = \frac{COV(r_x r_m)}{\sigma^2 m}$$

$$= \frac{1321.57}{1064.72}$$

$$= 1.24$$

Decision:- Beta coefficient of NABIL Bank Ltd. is 1.24 which is greater than 1. It indicates that stock return of NABIL is more volatile than market. So, NABIL is highly sensitive that 1% increase in market return there will be 1.24% rise in the stock return.

Appendix: C-2

Calculation of Beta coefficient of Nepal Investment Bank Ltd.(x)

Fiscal Year	$r_r - E(r_x)$	$r_m - E(r_m)$	$[r_r - E(r_x)][r_m - E(r_m)]$
2002/03	-15.93	-37.79	601.9947
2003/04	-3.04	-19.51	59.3104
2004/05	-36.73	1.28	-47.0144
2005/06	41.26	7.05	290.883
2006/07	14.45	48.98	707.761
			$\sum[r_x - E(r_x)][r_m - E(r_m)] = \mathbf{1612.9347}$

$$COV(r_x r_m) = \frac{\sum[r_x - E(r_x)][r_m - E(r_m)]}{n-1}$$

$$= \frac{1612.9347}{5-1}$$

$$= 403.23$$

$$Beta(\beta_x) = \frac{COV(r_x r_m)}{\sigma^2 m}$$

$$= \frac{403.23}{1064.72}$$

$$= 0.3787$$

Decision:- Beta coefficient of Nepal Investment Bank Ltd. is 0.3787 which is less than 1. It indicates that stock return of NIBL is less volatile than market. So, NIBL is less sensitive that 1% increase in market return rise in the stock return only 0.3787% change in NIBL stock's return.

Appendix: C-3

Calculation of Beta coefficient of Standard Chartered Bank Ltd.(x)

Fiscal Year	$r_r - E(r_x)$	$r_m - E(r_m)$	$[r_r - E(r_x)][r_m - E(r_m)]$
2002/03	-26.55	-37.79	1003.3245
2003/04	-25.19	-19.51	491.4569
2004/05	2.96	1.28	3.7888
2005/06	28.65	7.05	201.9825
2006/07	20.11	48.98	984.9878
			$\sum[r_x - E(r_x)][r_m - E(r_m)] = 2685.5405$

$$COV(r_x r_m) = \frac{\sum[r_x - E(r_x)][r_m - E(r_m)]}{n-1}$$

$$= \frac{2685.5405}{5-1}$$

$$= 671.39$$

$$Beta(\beta_x) = \frac{COV(r_x r_m)}{\sigma^2 m}$$

$$= \frac{671.39}{1064.72}$$

$$= 0.6306$$

Decision:- Beta coefficient of standard Chartered Bank Ltd. is 0.6306 which is less than 1. It indicates that stock return of SCBL is less volatile than market. So, SCBL is less sensitive that 1% increase in market return rise in the stock return only 0.6306% change in SCBL stock's return.

Appendix: C-4

Calculation of Beta coefficient of Himalayan Bank Ltd.(x)

Fiscal Year	$r_r - E(r_x)$	$r_m - E(r_m)$	$[r_r - E(r_x)][r_m - E(r_m)]$
2002/03	-30.93	-37.79	1168.8447
2003/04	-14.16	-19.51	276.2616
2004/05	-3.75	1.28	-4.8
2005/06	6.34	7.05	44.697
2006/07	42.52	48.98	2082.6296
			$\sum[r_x - E(r_x)][r_m - E(r_m)] = 3567.6329$

$$COV(r_x r_m) = \frac{\sum[r_x - E(r_x)][r_m - E(r_m)]}{n - 1}$$

$$= \frac{3567.6329}{5 - 1}$$

$$= 891.91$$

$$Beta(\beta_x) = \frac{COV(r_x r_m)}{\sigma^2 m}$$

$$= \frac{891.91}{1064.72}$$

$$= 0.8377$$

Decision:- Beta coefficient of Himalayan Bank Ltd. is 0.8377 which is less than 1. It indicates that stock return of HBL is less volatile than market. So, HBL is less sensitive that 1% increase in market return rise in the stock return only 0.8377% change in HBL stock's return.

Appendix: C-5

Calculation of Beta coefficient of Nepal Bangladesh Bank Ltd.(x)

Fiscal Year	$r_r - E(r_x)$	$r_m - E(r_m)$	$[r_r - E(r_x)][r_m - E(r_m)]$
2002/03	-46.16	-37.79	1744.3864
2003/04	-21.3	-19.51	415.563
2004/05	-44.77	1.28	-57.3056
2005/06	-44.54	7.05	-314.007
2006/07	156.75	48.98	7677.615
			$\sum[r_x - E(r_x)][r_m - E(r_m)] = \mathbf{9466.2518}$

$$COV(r_x r_m) = \frac{\sum[r_x - E(r_x)][r_m - E(r_m)]}{n-1}$$

$$= \frac{9466.2518}{5-1}$$

$$= 2366.56$$

$$Beta(\beta_x) = \frac{COV(r_x r_m)}{\sigma^2 m}$$

$$= \frac{2366.56}{1064.72}$$

$$= 2.22$$

Decision:-   Beta coefficient of Nepal Bangladesh Bank ltd. is 2.22 which is greater than 1. It indicates that stock return of NBBL is more volatile than market. So,NBBL is highly sensitive that 1% increase in market return there will be 2.22% rise in NBBL stock's return.

Appendix: C-6

Calculation of Beta coefficient of Everest Bank Ltd.(x)

Fiscal Year	$r_r - E(r_x)$	$r_m - E(r_m)$	$[r_r - E(r_x)][r_m - E(r_m)]$
2002/03	-35.92	-37.79	1357.4168
2003/04	7.01	-19.51	-136.7651
2004/05	-14.92	1.28	-19.0976
2005/06	12.71	7.05	89.6055
2006/07	31.14	48.98	1525.2372
			$\sum[r_x - E(r_x)][r_m - E(r_m)] = 2816.3968$

$$COV(r_x r_m) = \frac{\sum[r_x - E(r_x)][r_m - E(r_m)]}{n-1}$$

$$= \frac{2816.3968}{5-1}$$

$$= 704.10$$

$$Beta(\beta_x) = \frac{COV(r_x r_m)}{\sigma^2 m}$$

$$= \frac{704.10}{1064.72}$$

$$= 0.6613$$

Decision:- Beta coefficient of Everest Bank Ltd. is 0.6613 which is less than 1. It indicates that stock return of EBL is less volatile than market. So, EBL is less sensitive that 1% increase in market return rise in the stock return only 0.8377% change in EBL stock's return.

Appendix: D-1

Calculation of Systematic and Unsystematic Risk of NABIL Bank Ltd.

Total risk $= \sigma = 41.44 = 0.4144$

Total risk = Systematic risk + Unsystematic risk

$$\text{Systematic risk} = \beta^2 \times \sigma^2 m$$

$$= (1.24)^2 \times (0.3263)^2$$

$$= 0.1637$$

$$\text{Unsystematic risk} = \text{Total risk} - \text{Systematic risk}$$

$$= 0.4144 - 0.1637$$

$$= 0.2507$$

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

$$= \frac{0.1637}{0.4144}$$

$$= 0.395$$

$$= 39.5\%$$

$$\text{Proportion of unsystematic risk} = \frac{\text{Unystematic Risk}}{\text{Total Risk}}$$

$$= \frac{0.2507}{0.4144}$$

$$= 0.605$$

$$= 60.5\%$$

Appendix: D-2

Calculation of Systematic and Unsystematic Risk of Nepal Investment Bank Ltd.

Total risk $= \sigma = 29.68 = 0.2968$

Total risk = Systematic risk + Unsystematic risk

Systematic risk	$=$	$\beta^2 \times \sigma^2 m$
	$=$	$(0.3787)^2 \times (0.3263)^2$
	$=$	0.0153

Unsystematic risk	$=$	Total risk – Systematic risk
	$=$	$0.2968 - 0.0153$
	$=$	0.2815

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

$$= \frac{0.0153}{0.2968}$$

$$= 0.0515$$

$$= 5.15\%$$

$$\text{Proportion of unsystematic risk} = \frac{\text{Unystematic Risk}}{\text{Total Risk}}$$

$$= \frac{0.2815}{0.2968}$$

$$= 0.9485$$

$$= 94.85\%$$

Appendix: D-3

Calculation of Systematic and Unsystematic Risk of Standard Chartered Bank Ltd.

Total risk = σ = 25.36 = 0.2536

Total risk = Systematic risk + Unsystematic risk

Systematic risk $\quad = \quad \beta^2 \times \sigma^2 m$

$\quad\quad\quad\quad = \quad (0.6306)^2 \times (0.3263)^2$

$\quad\quad\quad\quad = \quad 0.0423$

Unsystematic risk $= \quad$ Total risk – Systematic risk

$\quad\quad\quad\quad = \quad 0.2536 – 0.0.0423$

$\quad\quad\quad\quad = \quad 0.2113$

Proportion of Systematic risk $\quad = \quad \dfrac{\text{Systematic Risk}}{\text{Total Risk}}$

$\quad\quad\quad\quad\quad = \quad \dfrac{0.0423}{0.2536}$

$\quad\quad\quad\quad\quad = \quad 0.1668$

$\quad\quad\quad\quad\quad = \quad 16.68\%$

Proportion of unsystematic risk $= \quad \dfrac{\text{Unystematic Risk}}{\text{Total Risk}}$

$\quad\quad\quad\quad\quad = \quad \dfrac{0.2113}{0.2536}$

$\quad\quad\quad\quad\quad = \quad 0.8332$

$\quad\quad\quad\quad\quad = \quad 83.32\%$

Appendix: D-4

Calculation of Systematic and Unsystematic Risk of Himalayan Bank Ltd.

Total risk= σ = 27.47 = 0.2747

Total risk = Systematic risk + Unsystematic risk

Systematic risk $\quad = \quad \beta^2 \times \sigma^2 m$

$\quad\quad\quad\quad\quad = \quad (0.8377)^2 \times (0.3263)^2$

$\quad\quad\quad\quad\quad = \quad 0.0747$

Unsystematic risk $\quad = \quad$ Total risk – Systematic risk

$\quad\quad\quad\quad\quad = \quad 0.2747 – 0.0747$

$\quad\quad\quad\quad\quad = \quad 0.2$

Proportion of Systematic risk $\quad = \quad \dfrac{\text{Systematic Risk}}{\text{Total Risk}}$

$\quad\quad\quad\quad\quad = \quad \dfrac{0.0747}{0.2747}$

$\quad\quad\quad\quad\quad = \quad 0.2719$

$\quad\quad\quad\quad\quad = \quad 27.19\%$

Proportion of unsystematic risk $= \quad \dfrac{\text{Unystematic Risk}}{\text{Total Risk}}$

$\quad\quad\quad\quad\quad = \quad \dfrac{0.2}{0.2747}$

$\quad\quad\quad\quad\quad = \quad 0.7281$

$\quad\quad\quad\quad\quad = \quad 72.81\%$

Appendix: D-5

Calculation of Systematic and Unsystematic Risk of Nepal Bangladesh Bank Ltd.

Total risk= σ = 88.24 = 0.8824

Total risk = Systematic risk + Unsystematic risk

Systematic risk $\quad = \quad \beta^2 \times \sigma^2 m$

$\quad\quad\quad\quad\quad\quad\quad = \quad (2.22)^2 \times (0.3263)^2$

$\quad\quad\quad\quad\quad\quad\quad = \quad 0.5247$

Unsystematic risk $\quad = \quad$ Total risk – Systematic risk

$\quad\quad\quad\quad\quad\quad\quad = \quad 0.8824 – 0.5247$

$\quad\quad\quad\quad\quad\quad\quad = \quad 0.3577$

Proportion of Systematic risk $\quad = \quad \dfrac{\text{Systematic Risk}}{\text{Total Risk}}$

$\quad\quad\quad\quad\quad\quad\quad\quad\quad = \quad \dfrac{0.5247}{0.8824}$

$\quad\quad\quad\quad\quad\quad\quad\quad\quad = \quad 0.5946$

$\quad\quad\quad\quad\quad\quad\quad\quad\quad = \quad 59.46\%$

Proportion of unsystematic risk $= \quad \dfrac{\text{Unystematic Risk}}{\text{Total Risk}}$

$\quad\quad\quad\quad\quad\quad\quad\quad\quad = \quad \dfrac{0.3577}{0.8824}$

$\quad\quad\quad\quad\quad\quad\quad\quad\quad = \quad 0.4054$

$\quad\quad\quad\quad\quad\quad\quad\quad\quad = \quad 40.54\%$

Appendix: D-6

Calculation of Systematic and Unsystematic Risk of Everest Bank Ltd.

Total risk$= \sigma^2 = 25.95 = 0.2595$

Total risk = Systematic risk + Unsystematic risk

Systematic risk $= \beta^2 \times \sigma^2 m$

$= (0.6613)^2 \times (0.3263)^2$

$= 0.0466$

Unsystematic risk $=$ Total risk – Systematic risk

$= 0.2595 - 0.0466$

$= 0.2129$

Proportion of Systematic risk $= \dfrac{\text{Systematic Risk}}{\text{Total Risk}}$

$= \dfrac{0.0466}{0.2595}$

$= 0.1796$

$= 17.96\%$

Proportion of unsystematic risk $= \dfrac{\text{Unystematic Risk}}{\text{Total Risk}}$

$= \dfrac{0.2129}{0.2595}$

$= 0.8204$

$= 82.04\%$