CHAPTER- I
INTRODUCTION

1.1 General Background

Return is the income receives from the investment over a given period of time. It means reward or profit on investment. Return may take two forms such as single period rate of return and multiple period rate of return. Single period rate of return is the sum of capital gain yield and the dividend yield. But multiple period return includes all incomes receive more than one time on percentage over beginning investment. Investment is made on either financial assets or other non-financial assets. Financial assets are stocks and bonds that can be purchased or sold. Non-financial assets are capital budget or other investment opportunities. An investment is a commitment of money that is expected to generate additional money.

Risk in a financial analysis is the variability of return. It means that risk is fact in an indication of chance of losing investment value. All investments bear risk. Therefore, the investors should be aware of various sources of risk. Assets having greater chances of loss are viewed as more risky than those with lesser chances of loss. Risk can not be avoided if an investor is seeking higher rate of return. It is difficult to define but you know it when you see it. The more the risk more will be the return and the less the risk less will be the return.

Risk is of two types. They are systematic risk and unsystematic risk. Systematic risks are also of four categories. They are purchasing power risk, interest rate risk, market risk and exchange rate risk. Purchasing power risk refers to risk of inflation. Interest rate risk refers to the change in market interest rates. Market risk is related to the behavior of market in general and exchange rate risk results from adding international investment to a portfolio. Business risk and financial risk are the components of unsystematic risk. Business risk is existed with the particular industry whereas financial risk is related to the financial health of the company.

For the entire development of any country, each and every sector should be strong and capable. Among them, economic sector is one of the major sectors. Banks and financial institutions are playing vital role in the economic development of the country. So, if there is insufficient of banking and financial facilities, the growth of economy development is decreased. Banks and financial institutions assist in economic development by mobilizing short term as well as long term capital needed for the productive sectors. Especially banks and finance companies provide various facilities to the people engaged in trade, commerce and industry. Hence they are being the means for the uplift of society. Banking institutions have many functions such as accepting deposit, providing interest , culminates in the formulation of capital, granting loans that help to remove deficiency of capital , performing agency functions which make life easier and they also play an important role in credit creation. When economy boom is appeared, banks increase interest rate, which reduces the probability of inflation and in case of depression they reduce interest rate so that people are interested in investment. Similarly finance companies also assist the business firm by purchasing firm's share and bond and these companies also help them by providing loan. Thus, these companies play vital role to promote trade and industry. They reduce the risk (future uncertainty) for trade and industry.

Analysis of risk and return shows the relationship of trade of between risk and return on any kind of investment. Investment is sacrificing of current for future cash inflows. The future cash inflows are the returns and the fear of not receiving the cash inflow (or not getting the return) is the risk.

1.2 Focus of the Study

In modern day the business firms and industrial organizations are being rapidly established for the purpose of national development. Without development of industry and commerce, the development of nation is unthinkable. The industry and commerce are the fundamental base to make the infrastructure of the developing country like Nepal. These organizations can not survive without financial support. "The financial institutions in Nepal refer to any institution established with the

objective of providing loan to agriculture, co-operative industry, any other specific economic sector or accepting deposit from the general public."[1]

With the speed of time the risks in different sectors are increased day by day. To diversify these risks and promote the investment of the society with lower income, banks and finance companies should be established. That is why banks and finance companies are being established everywhere in the world. The investor interprets the term 'risk' differently. "Risk is considered as the variability of returns from those that are expected."[2] Some perceive it as a fluctuation in market price of the investment while the other considers it as an uncertainty of return. The investors also view the risk as an uncertainty of whether the invested amount will be returned or not. Risk can be considered as the possibility that the actual return from the investment will deviate from an expected return. Risk can be categorized into two parts i.e. diversifiable and non-diversifiable risk. Diversifiable risk can be defined as the risk that can be totally controlled or eliminated, while the risk that can not be eliminated is termed as non- diversifiable risk.

Return is generally understood as a reward of receipt as cash inflow for an investment. The return from a capital investment is a concept that has different meaning to different investors. Some investors regard it as a short term cash inflow while the other perceive it as a high growth rate and higher rate of return in the long run. Still other measures it in term of financial ratios such as return on investment or return on equity. "Return can be stated as an income received on an investment plus any change in market price usually expressed as a percentage of the beginning market price of the investment."[3] Return consists of current yield and capital gain and is generally expressed in terms of percentage basis.

Thus, it is clear that the study is focused on the analysis of risk and return of banking and finance companies of Nepal using the five years data.

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[1] Nepal Rastra Bank act 2012,section

[2] James C. Van Horne and John M. Jr. Wachwoitz, *Fundamentals of Financial Management*, 9th Edition, Prentice Hall of India Pvt. Ltd., New Delhi, 1997, P. 90.

[3] Lawrence J. Gitman, *Principle of Managerial Finance*, 5th Edition, Warper & Row Publishers, New York, 1988, P. 211.

1.3 Statement of the problems

Banking and finance companies operate successfully that lead to the uplift of the nation's economy while unsuccessful operation causes serious problems to the financial condition of the country. The study of risk and return diagnoses, analyses and interprets the risk and return position of each institution. Risk and return analysis is essential troll in the area of investment because an investor can predict his/her profitable return with less risk from investing different investment alternative projects. The relationship of risk and return helps the investors to select the institution for the financial transactions. Generally, we understand that lower risk gives lower return and higher risk gives higher return. So, to test whether the statement is true or not this research is carried out. In the context of Nepal, due to the lack of reliable information and poor knowledge, banks and finance companies are facing with various problems although the attitudes, thoughts and knowledge of the most investors have not changed yet. Most of the investors are least familiar with the financial activities. They don't have the theoretical knowledge of risk and return. Lack of theoretical knowledge of risk and return associated with investment, most of the investors are making investment in non-profitable projects. That is why the present study of risk and return seeks the answers of the following questions:

- What is the risk-return trade off status of each institution under the study?
- What is the degree of correlation between the risk and return of the institution under the study?
- What kind of relationship does there exit between risk and return?
- How can an investor evaluate the magnitude of risk and return?
- How can an investor construct efficient portfolio?
- What should be compensation for bearing the risk?
- How can make higher return through risk?
- What is the trend of return?
- How much is the risk with the return?
- What are the rates of return of each institution?

- Which institution is the best among selected companies under the study?

1.4 Objectives of the Study

Objective is the end result of the achievement. Every work has its own objectives. The central objective of this study is to analyze, examine and interpret the status of risk and return of banking and finance companies. Its specific objectives are as follows:

- To determine the optimum portfolio structure.
- To measure the systematic and unsystematic risk of the commercial banks and finance companies.
- To evaluate the degree of attractiveness of the banking and finance companies in term of risk and return.
- To know the trend of return of the each company.
- To know the risk and return position of banking and finance companies.
- To compare between companies′ risk return and markets′ risk return.
- To give suggestion to government, public, employee and management.

1.5 Signification of the Study

The research work deals with the risk and return position of banking and finance companies in Nepal. People are interested to know about the risk of the company that helps to minimize their risk position. After all, banks and finance companies are the base for the economic growth and development of the country. Therefore the study has been become essential to each people for the various purposes that can be described as follows:

I. To the Shareholders:

Every shareholder of the company wants to know about the risk and return position of his/her investment because his/her wealth has been invested there. So, this proves the importance of the study to each shareholder.

II. To the Management:

Company depends on the management and the management also depends on the company. No one company gets success without good management. Therefore, the managers are interested to know about financial position of the organization. The risk associated with the return is also their subject matter. It helps them to find the degree of tolerance of the risk under a given return. In this way, the study is useful to the management of the financial institution.

III. To the Entrepreneur and Businessman:

Banking and finance companies provide service to the entrepreneur and businessman. Without this service, their business can not be conducted. Therefore the entrepreneur and businessman prefer the financial institution having low risk with high return. In this context, the study is importance to them.

IV. To the Government:

The government is responsible institute for the country. Therefore, the government is curious to know about the risk and return position of those institutions that play vital role for the economic growth and development of the country. Banks and financial institutions serve as an indicator of nation's economy. The research helps to make suitable plan and policy for the country. So, the study is important to the government for the formulation and implementation of fiscal and monetary policy.

V. To the Public:

Apart from above mentioned parties, the study is also important to people that comprise of customers, creditors, investors, competitors, stock brokers, students, economists, statisticians and other rational individual.

1.6 Research Hypothesis

A hypothesis is a tentative statement made about the relationship between two or more variables but the validity of statement to be tested on the basis of study of samples. In fact, hypothesis is a bridge in the process of inquiry or search which begins with problems and ends without the resolution of the problems. In its initial stage, a hypothesis may be an imagined idea or a more guess, depending upon previous accumulated knowledge. Hypothesis testing is to test some hypothesis about parent population from which the sample is drawn. Each test contains of two hypotheses, one is the null hypothesis (Ho) and the other is the alternative hypothesis (H1). The assumption of no difference between population or any association and factors in the population is known as null hypothesis (H_0) otherwise alternative hypothesis (H_1). The hypothesis must be constructed that if one hypothesis is accepted, the other is rejected and vice versa. There is one test (t-test) which is carried out in the study. There are altogether two hypotheses that are presented below.

Hypothesis applied for the t-test

H_o: There is no significant correlation between risk and return of a number of profitability ratios of various companies under the study.

H_1: There is significant correlation between risk and return of a number of profitability ratios of various companies under the study.

1.7 Limitations of the Study

A research is a vast study investigating the subject matter for solving perceived research problem. Each and every study has its own limitations. No study can be free from constraints such as economic resources and time etc. And this study too is not an exception. The main limitations of this study are presented below.

i. This study is mainly based on the secondary data derived from previous thesis and NEPSE website www.nepalstock.com.
ii. Only 5 years data from FY 2004/05 to FY 2008/09 are used for the study.
iii. The research only covers the study of 5 commercial banks and 2 finance companies.
iv. This study only focuses on the position of risk and return of the banks and finance companies.
v. The analysis of the study is drawn relying on financial and statistical tools. Various financial and statistical tools have been used to analyze the data of banks and finance companies.
vi. The result found may not always be true in future.
vii. The time value of money has not been considered by the data used for the analysis.
viii. The study has been completed under allotted time and cost according to the given format by faculty of management.

1.8 Review of Literature

Review of literature is one of the most significant parts of research. It will be better to review some fundamental aspects of relevant literature before doing analysis. So it is attempted to present in brief glimpses on the status of risk and return of banks and finance companies.

Research is a continuous process. The procedure of finding may be changed but it never ends. In literature, review researcher reviews the books, journals, magazines or any other types of studies, which are related to his/her study field, in order to analyze the data and to find something new. Review of literature further helps us to identify the problems, to avoid unintentional replication of previous studies and also helps us to interpret the significance of researchers′ results in precise manner. The study deals with theoretical aspect of the topic on risk and return analysis of commercial banks and finance companies in Nepal in analytical and descriptive manner. Various

books, journals, thesis of seniors and some research reports related with the topic have been reviewed in the study.

The study is divided into two parts.

a. Theoretical Framework
b. Review of Related Studies

1.9 Research Methodology

Research methodology is a way to systematically solve the research problems. It refers to the various sequential steps that are to be adopted by a researcher during the course of the study problems with certain objectives. It refers to the overall research method from the theoretical aspects to the collection and analysis of data. This study covers quantitative methodology in a greater extent and also uses the descriptive part based on both technical aspects and logical aspects. This research tries to perform a well- designed quantitative and qualitative research in a very clear and direct way using both financial and statistical tools. Detail research methods are described in the following headings:

1.9.1 Research Design

In order to make any type of research, a well-set research design is necessary to fulfill the objectives of the study. Generally, research design means definite procedures and techniques which guide to study and provide ways for research viability. It is arrangement for collection and analysis of data. To achieve the objectives of the study, descriptive and analytical research design are used. Some financial and statistical tools have been applied to examine the facts in the study. Descriptive techniques have been adapted to analyze the position on risk and return of commercial banks and finance companies in the NEPSE.

1.9.2 Population and Sample

The term "Population" and "Universe" for research means all the members of any well defined class of people, events, organizations or terms. The population means aggregate or the entire group. To collect detail information about population are difficult because population consists of large groups. So a sub-group is chosen that is believed to be representative of the population. This sub-group is called sample. The sample allows the researchers more time to make an intensive study of a research problem. Good sampling techniques can only save the time and money for the researchers.

This study basically concentrates on specific sectors i.e. commercial banks and finance companies in Nepal. The commercial and finance companies are the most efficient sectors among the others. So, this research study basically focuses on those commercial banks and finance companies. The names of companies are given below:

Name of the sample banks

- Bank of Kathmandu Ltd.
- Himalayan Bank Ltd.
- Nepal Bangladesh Bank Ltd.
- Nepal Investment Bank Ltd.
- Nepal Industrial and Commercial Bank Ltd.

Name of the sample finance companies

- Narayani Finance Ltd.
- Premier Finance Ltd.

1.9.3 Nature and Sources of Data

This study is primarily based on secondary sources of data. The required data have been collected from previous thesis and financial statement of listed companies which have been located at NEPSE website www.nepalstock.com.

Financial data of four banks for FY 2004/2005 are obtained from previous thesis and data of four banks for FY 2005/2006 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com. Likewise data of only one bank and two finance companies for FY 2004/2005 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com. This study is associated with past phenomena therefore, only secondary data have been used to carry out the whole calculation.

Under this method, there are two parts. They are data collection process and data processing procedure which are explained in chapter –III.

1.9.4 Data Analysis Tools

The data collected from previous thesis and NEPSE website www.nepalstock.com leads to the logical conclusion only if the appropriate tools and techniques are adopted to analyze such data. The collected data does not have meaning if such data are not analyzed. To analyze the data in this research, the researcher has used some financial and statistical tools which are listed below:

Financial tools are:

- Return on assets
- Return on shareholder's equity
- Dividend payout ratio
- Dividend yield
- Earning yield
- Price earning ratio
- Earning power ratio

Statistical tools are:

- Arithmetic mean
- Standard deviation
- Coefficient of variation
- Trend analysis
- Karl Pearson's correlation coefficient
- Student's t-test

1.10 Scheme of the Study

The research of risk and return of banks and finance companies have been divided into five chapters. The titles of each of the chapter are listed below.

Chapter I	:	Introduction of the Study
Chapter II	:	Review of Literature
Chapter III	:	Research Methodology
Chapter IV	:	Presentation, Analysis and Interpretation of Data
Chapter V	:	Summary, Conclusion and Recommendation

Chapter I: This is the introduction chapter of the study. This chapter includes focus of the study, statement of the problems, objectives of the study, significance of the study, research hypothesis, limitations of the study, review of literature, research methodology and scheme of the study.

Chapter II: This is the chapter of review of literature that deals with conceptual framework of the risk and return. In this chapter, research history of risk and return is to be presented in brief. Review of major studies is also to be presented.

Chapter III: This chapter contains of the research methodology. This chapter deals with research design, population and sample, nature and sources of data, techniques of analysis, analytical tools and limitations of the methodology in the study.

Chapter IV: This chapter is the main part of the study. Under this chapter the obtained data are presented, analyzed and interpreted about the position of risk and return of banks and finance companies in brief with the help of various financial and statistical tools.

Chapter V: This is the last chapter of the study that summarizes the whole study. Moreover, it draws the conclusions and forwards the recommendations.

Besides these chapters necessary bibliography and appendices have been included in the study.

CHAPTER - II

REVIEW OF LITERATURE

2.1 Introduction

Review of literature means reviewing research studies in the related area of the study so that all the past studies, their conclusions and deficiencies may be known and further research can be conducted. Mostly, review of literature begins with a search for a suitable topic and continues through the duration of the research work.

Researchers who conduct studies under the guidelines of scientific research never begin a research project without first consulting available literature to learn what has been done, how it was done, and what results were generated. The purpose of literature review is to familiarize one with the previous methodologies, to prevent from duplication of previous work, to assist in the refining of the statement of the problems, to provide one the convincing arguments as to why this particular research is needed and to help in finding sources of information.

Literature review provides the foundation for developing a comprehensive theoretical framework from which hypothesis can be developed for testing and also minimizes the risk of pursuing the dead-ends in research.

This chapter includes a comprehensive review of recent and relevant literature related to the risk and return analysis. The relevant literature and articles are reviewed from international journals; national publication, annual report and security board availed from various libraries and institutions. The review of literature for the study is classified into two sections. The first section deals with the theoretical review of risk and return and finally the second section reviews the previous related studies in the field.

2.2 Theoretical Framework

It helps to clear the vision of the study. This makes the study more meaningful and easy to understand the problem of the study.

2.2.1 Meaning and concept of Risk and Return

Risk and return are widely used tools in finance. They are important elements. This is because the study of risk and return provides not only general concept to the investors but also leads to the top position of a business. Risk and return are the foundation of the modern finance theory. In this study, we can analyze what is return? How is it measured? What is risk?

2.2.2 Concept of Return

The return is total gain or loss experienced on an investment over a given period of time. While an investor selects investment alternative, the first work is to identify benefit from investment. Every investor wants to have a return from an investment as much as they need. Return on a typical investment consists of two components. The first component that usually comes to mind is the periodic cash receipts (either interest or dividend). This cash receipt is also known as an ordinary gain on investment. The second component is the appreciation in the price of the assets and this is commonly called a capital gain or loss. The capital gain or loss is the difference between the purchase price and the price at which the asset can be sold. Therefore, the total return on investment is the sum of the ordinary gain and the capital gain or loss.

Mathematically,

Total return = Capital gain (loss) + Ordinary gain

Capital gain/loss = Ending value of asset — Beginning value of asset

Ordinary gain = Dividend or interest

Return can be expressed in Rupees return and Percentage return. Normally a return denotes the percentage return.

Total return (in Rupees) = Capital gain (loss) + Ordinary gain

Using notation,

Total return (in Rupees) = $P_1 - P_o + D_1$ or I_1

OR = $P_{t+1} - P_t + D_t$ or I_t

Where,

P_1 or P_{t+1} = Ending price or selling price

P_o or P_t = Beginning Price or Purchase Price

D_1 or D_t = Dividend receipt or cash receipt (For share)

I_1 or I_t = Interest receipt (For bond)

Some definition of return given by different expert in finance is represented below.

"The amount that invested money will earn is called the investment return."[4]

"The investment return is defined as the after take increase in the value of the initial investment. The increase in value can come from two sources: a direct cash payment to the investor or an increase in the market value of the investment relative to the original purchase price."[5]

"The rate of return from a capital investment is a concept that has different meanings to different investors. Some companies seek near-term cash inflows and give less value to more distant returns. Such a firm might purchase the stock of other firms that pay large cash dividends. Other investors are concerned primarily with growth. They would seek projects that offer the promise of long term, higher than average growth of sales and earnings. Still others measure return using financial

[4] J.M. Cheney and E.A Moses, *Fundamentals of Investments*, West Publishing Company, New York, 1992, P.30.
[5] J.M. Cheney and E.A. Moses, *Fundamentals of Investments*, West Publishing Company, New York, 1992, P.30.

ratios. They might seek to invest in a company that has a high return on investment or equity."[6]

"The rate of return is the percentage increase in our wealth associated with holding the stock for the period. Our dollar return is equal to cash dividend received during the period plus the change in the value of the stock in the period. Our percentage rate of return is equal to the dollar return dividend by the market value of the stock at the beginning of the period."[7]

2.2.3. Classification of Measurement of Return

(A) Single Period Rate of Return (r_t)

Or, Holding Period Rate of Return (HPR)

The return earned on investment within one fiscal year (in a single period) is known as single period return. Holding period returns are often calculated for a period other than one year, for this reason, the length of the holding period must always be indicated for a specific single period return. In general, if the length of the holding period is not specified, it is assumed to be one year. Single period return measures increment or decrement of the investor's wealth. Investor expects and realized two types of return from an investment in a share of stock or a bond. They are as follow:

i) Capital or price appreciation (Gain)/ Capital depreciation (Loss)

ii) Cash Receipts in the form of dividend or interest

The HPR is calculated as follows:

For long Run (For purchase case)

HPR or r_t = Capital gain yield+ Dividend yield

[6] J.J. Hampton, *Financial Decision Making: Concepts, Problems and Cases,* Prentice Hall of India, New York, 1983, P. 341.

[7] R.A. Haugen, *Modern Investment Theory,* Prentice Hall International Inc., 1997, P.39.

$$X \frac{p_1 Z p_0}{p_0} \Gamma \frac{D_1 or I_1}{P_0}$$

$$= \frac{P_1 Z P_0 \Gamma D_1 or I_1}{P_0}$$

For Short Run (for sale case)

HPR or r_t = Capital loss yield – Dividend yield

$$= \frac{P_0 Z P_1}{p_0} Z \frac{D_1 or I_1}{P_0}$$

$$= \frac{P_0 Z P_1 Z D_1 or I_1}{P_0}$$

Where,

HPR or r_t = Holding period return or single period return at time 't'

P_o = Beginning price or purchase price

P_1 = Ending price or selling price

D_1 = Cash dividend or cash receipts

I_1 = Interest

" An investment's single period rate of return is simply the total return an investor would receive during the investment period or holding period stated as a percent of the investment's price at the start of the holding period."[8]

"Return is the change in value of an assets plus any cash distribution, expressed as a percentage of the beginning of period investment value."[9]

(B) Expected Rate of Return

OR, Mean Rate of Return

OR, Average Rate of Return

OR, Arithmetic Mean Return

[8] J.C. Francis, *Investment Analysis and Management*, MCGraw Hill International, New York, 1993, P.1.
[9] Op. Cit. Gitman, P. 211.

The return that an investor expects from his investment in the forthcoming future is called expected rate of return. It is the most familiar statistical measure to any investor or individual. This return does not consider the time value of money. "The mean, or average, return is defined as the probability of observing each rate of return, Pi, multiplied by the rate of return, Ri and then summed across all possible return."[10] when probability of each rate of return is given, expected rate of return is obtained by summing the products of the rates of return and their respective probabilities and when probability of each rate of return is not given expected rate of return is calculated by dividing the total return of multiple period by the number of observations or returns.

Mathematically,

- **If Probabilities are given**

  Expected return of j^{th} item, $E(r_j)$ or $\bar{r}_j$ or $\hat{r}_j = \sum_{jx1}^{n} r_j \mid p_j$

  $= r_1 p_1 \Gamma r_2 p_2 \Gamma \ldots\ldots\ldots \Gamma r_n p_n$

- **If Probabilities are not given**

  Expected return of j^{th} item, $E(r_j)$ or $\bar{r}_j$ or $\hat{r}_j = \frac{\sum_{jx1}^{n} r_j}{n} X \frac{r_1 \Gamma r_2 \Gamma \ldots\ldots\ldots \Gamma r_n}{n}$

Where,

r_j = Rate of return of the j^{th} item or event or outcome

P_j = Probability of the j^{th} item or event or out come

n = Number of periods/ number of observed returns of j^{th} item or event or outcome

r_n = Rate of return of n^{th} periods

P_n = Probability of n^{th} Periods

[10] J. Fred Weston and Thomas E. Copeland, *Managerial Finance*, 7th Edition, The Dryden Press, Chicago, 1990, P. 363.

r_1 = Rate of return of first year

r_2 = Rate of return of second year

= Summation

The expected rate of return is based upon the expected cash receipts over the holding period and the expected ending or selling price of stock. Depending upon the assumption made about the cash receipts in future and ending price, a number of expected rates of returns can be formed. The possible rates of return estimated by the investors are summarized in expected rate of return. The expected rate of return on investment should be greater than required rate of return for an acceptable and good investment.

(C) Required Rate of Return

The rate of return required by an investor from each risky investment is called required rate of return. Required rate of return is always more than risk free rate of return (rf) because the investor takes the risk. Due to taking the risk the investor wants extra rate of return, which is called risk premium. Risk premium on risky security is calculated as follows:

Risk Premium = b_i $[E(r_m) - r_f]$

Although the required rate of return and expected rate of return seems to be same, however, there is difference between them. Expected rate of return as discussed earlier, is the expected rate of return that may be more or less than the actual rate of return.

Required rate of return refers to the minimum return that an investor expects at least not to suffer from loss. In other word, required rate of return is that rate of return that an investor must earn on his/her investment. It means if investor gets the return below the required rate of return he/she suffers from loss. The required rate of return is the function of real rate of return and risk. Security market line (SML) or

Capital assets pricing model (CAPM) gives the equation to calculate the required rate of return as under:

K_i = Risk free rate + Risk premium

$r_f + b_i[E(r_m) - r_f]$

Where,

k_i = Required rate of return of i^{th} stock

r_f = Risk free rate of return

$E(r_m)$ = Expected market return

= Expected market rate of return

b_i = Beta of i^{th} stock

= Systematic risk of i^{th} stock

This formula can be used to calculate on an individual investment and portfolio investment. While setting the required rate of return on investment, an investor must consider the real rate of return, expected inflation and risk. Because consumption is foregone today, the investor is entitled to a rate of return that compensates for this deferred consumption. Since the investor expects to receive an increase in the real goods purchase later, and assuming for the moment, zero expected inflation and risk, the required rate could equal the real rate of return in which case it would represent the pure time value of money. The capital markets determine this rate based upon the supply of money to be invested relative to the demand for borrowed money.

Decision Rule

- If Required Rate of Return is lower than the expected Rate of Return, it is called under pricing. So the investors buy the security.
- If Required Rate of Return is greater than the expected Rate of Return, it is said overpricing. So the investors sell the security.

(D) Geometric Mean Return

The multi period (or compounded) rate of return is called the geometric mean return. When percentage changes in value over time are involved, the arithmetic mean of these changes can be misleading. In that period geometric mean return measures accurately the realized change in wealth over multiple periods. It also measures compound cumulative returns over time. So, it is often used in investments and finance to reflect the growth in investment funds. The geometric mean rate of return for an investment can be calculated with the following equation:

$GM=[(1+r_1)(1+r_2) \ldots\ldots\ldots (1+r_n)]^{1/n}-1$

Alternatively,

$GM=\sqrt[n]{(1+r_1)(1+r_2)\ldots\ldots\ldots\ldots\ldots\ldots(1+r_n)}$

Where,

GM = The geometric mean return

r_1 = The return for time period 1

r_2 = the return for time period 2

r_n = The return for time period n

n = The total number of time periods

(E) Return on The basis of Briskness:

Return can be shown on the basis of risk. On the basis of briskness of an asset, the return can be categorized into two parts.

i) Risk free rate of return

The rate of return form risk free investment is called risk free rate. The return from Treasury bill, bank deposit and government bond is called risk free rate because there is hundred percent sure that the government has to pay the rate of interest. There is no any chance of loss. Generally, to collect fund and control inflation and provide certain percent interest on the security the government issues its security to the public. Treasury bills are only sold on a discount basis. So

investors can buy the bills at a discount from the stated maturity value. At the bill's maturity, the holder receives from the government a payment equal to the face value of the bill. The discount to investors is the difference between the price they have paid and the face amount they will receive at maturity. Risk free rate of return is lower than the market rate of return. If the rate of return from investment can be estimated with hundred percent certainties, the rate of return is called risk free rate of return.

ii) Market rate of return

Market rate of return is that rate of return that is affected by different factors in market. There is a tough competition in the market. The risk is also prevailing in the market. Market rate of return is based on the risk free rate of return. Therefore, the market rate of return gives higher rate of return than the risk free rate of return. Actually, market rate of return constitutes of risk free rate and market risk premium.

(F) Real Rate of Return

Real rate of return is actual rate of return of any security. It is used to measure the financial position of the firm over the period. It also helps in measuring the purchasing power risk. If value of real rate of return comes in positive, it indicates that the firm's financial position is sound or good and vice versa. Real rate contains no adjustment to eliminate the effects of inflation. It is calculated by using this equation:

Real rate of return (rr)= $\frac{1\Gamma r}{1\Gamma q}$ Z1

Where,

r = Nominal rate of return

= Fixed rate of return

= Bank's rate of return

= Depository rate of return

q = Rate of inflation

2.2.4. Arithmetic Mean Return Versus Geometric Mean Return:

Two mean returns can be calculated to express our multi-period returns as annualized returns, but which mean should be used to measure the performance of the investment over multi-period? The answer depends on the investor's objective.

- The arithmetic mean return is appropriate as a measure of the central tendency of a distribution of return for particular periods.
- The arithmetic mean return in case of a percentage change in value over a time period can be a misleading one for example:

Table No. 1

Year	Ending	Holding period return (r)
1	Rs. 10	.....
2	Rs. 20	$\frac{20 - 10}{10} \times 100\% = 100\%$
3	Rs. 10	$\frac{10 - 20}{20} \times 100\% = -50\%$
		Total = 50%

Mean return, E(r) = $\frac{50\%}{2} = 25\%$

The value in the beginning of year 2 or end of year 1 is Rs. 10 and at the end of year 3 is also Rs. 10. The value has not changed over the period but the arithmetic mean is showing a 25% change therefore, it is a misleading one to show the change in value but the central tendency that it is showing is correct one.

- Geometric mean return can express the true average rate of return over a multi-period and can show accurately the change in the investment value. In the above example:

  $GM=[(1+1)(1–0.50)]^{1\backslash 2}–1=0\%$

The geometric mean return is 0%. It means, over the two years' holding period, the wealth has changed by zero percent.

- ❖ Due to the inherent bias in the arithmetic mean, the geometric mean will always be equal to or less than the arithmetic mean.
- ❖ Geometric average is considerably lower than the arithmetic average because it reflects the variability in the returns.
- ❖ The geometric mean and arithmetic mean will only be equal when the holding period returns are constant over the investment period. For example

Table No. 2

Year	r_1	r_2
1	15%	10%
2	10	10
3	5	10
4	5	10
	$\Sigma r_1=35$	$\Sigma r_2=40$

.

$$E(r_1) = \frac{r_1}{n} \text{ X } \frac{35}{4} \text{ X } 8.75\ \%$$

$$E(r_2) = \frac{r_2}{n} \text{ X } \frac{40}{4} \text{ X } 10\%$$

$GM_1 = [(1+0.15)\ (1+0.10)\ (1+0.05)\ (1+0.05)]^{¼} - 1 = 8.67\%$

$GM_2 = [(1+0.10)\ (1+0.10)\ (1+0.10)\ (1+0.10)]^{¼} - 1 = 10\%$

Summary of Table No.2

Table No. 3

	r_1	r_2
E(r)	8.75%	10%
GM	8.67%	10%

Where,

GM = Geometric mean

GM_1 = Geometric mean of 1st stock

GM_2 =Geometric mean of 2nd stock

r_1 =The return of 1st stock

r_2 =The return of 2nd stock

$E(r_1)$ = Expected rate of return of 1st stock

$E(r_2)$ = Expected rate of return of 2nd stock

$\sum$ = Summation

2.2.5 Concept of Risk

Risk refers to the chance that some unfavorable event will occur. For example: while you play the gambling, there will be the risk of losing your money. Similarly to invest in share of any company in the hope of earning, there will be the risk of not recovering the investment. So different people interpret risk in different ways. But risk in a financial analysis is the variability of return. The deviation between the expected and actual return brings variability in the return and the variability is termed as risk. The higher the deviation between expected and actual returns, the higher will be the risk. This risk is measured by standard deviation (S.D.) and coefficient of variation (C.V.). Standard deviation is absolute measurement of risk while coefficient of variation is relative measurement of risk.

Risk and return in investment go together and without risk no more return can be expected.

Risk, in other words, is defined as uncertainty of returns and if there is certainty there is no risk at all. "Risk can be defined as a financial loss or more formally, the variability of returns associated with a given asset."[11]

James C. Van Horne in his book entitled "Financial Management and policy" defined the risk as the possibility that the actual return from holding a security will deviate from an expected return.[12] The risk is expressed by various ways using the different words, such as uncertainty, chances of loss, volatility of returns and so on. These all words ultimately have the same meaning and widely accepted the risk in similar manner. Weston and Brigham, in the book entitled "Managerial Finance" defined the risk as the probabilities that the returns and therefore the values of an asset or security may have alternatives outcomes.[13]

An investment is considered risky if it is accomplished by high volatile return. Risky investment has a high potential of loss. Hence, a rational investor strives to secure the largest possible rate of return at the minimum level of risk that he is willing and able to assume. Theoretically, an investor seeking a higher return has to assume a higher risk and investor assuming a lower risk and return, the risk pertaining to an investment project is determined by a computing the variance of the returns associated to the investment project.

2.2.6 Classification of Measurement of Risk

A) Variance

B) Standard Deviation

C) Coefficient of variation

D) Beta

[11] Op. Cit.. Gitman, P. 211.
[12] Op. Cit. Van Horne and Wachowitz, P. 37.
[13] J. Fred Weston and Eugene F. Brigham, *Managerial Finance*, 11th Edition, The Dryden Press, New Delhi, 1996, P. 93.

A) Variance

Variance means the variation of return from the expected return. It measures the volatility of return. The mean return is subtracted from the actual return and the result is squared and multiplied with the respective probability. So, the sum of the result is said to be the variance.

"The variance of return (given that we have subjective probability estimates and sampling statistics) is defined as the average of the mean squared error terms. A mean squared error is simply the square of the difference between a given return, R_i, and average of all return, E(R): Mean squared error = $[R_i - E(R)]^2$"[14]

Symbolically,

$$\sigma^2_j = \text{Variance} = \text{Var}(r_j) = \sum_{j=1}^{n} [r_j - E(r_j)]^2 \times p_j$$

OR,

$$\sigma^2_j = \text{Variance} = \text{Var}(r_j) = \sum_{j=1}^{n} r^2_j \times p_j - E(r_j)^2$$

Where,

σ^2_j = The variance of return of i^{th} item

r_j = Rate of return of j^{th} item

$E(r_j)$ = Expected rate of return of j^{th} item

P_j = Probability associated with j^{th} item

n = Number of items or events

$\sum$ = Summation

When the observations (in this case, the returns) are considered to be a sample from the total population of observations, dividing by n−1 provides unbiased

[14] Op. Cit. Van Horne and Wachowitz, P. 62.

estimates of the true population variance or standard deviation. If observations represent to entire population, the sum of the squared deviations is divided by n. Since in corporate finance or financial management, we are almost always sampling, therefore n−1 will be used in denominator. In case of investments most authors prefer to use n in denominator since true population is used. This is because while variance is calculated in financial management from a sample of observed return (historical data), variance is calculated by adding the squared deviations and dividing it by n−1 rather than n to correct for that is called the loss of a degree of freedom.

Mathematically,

$$\sigma^2_j = \text{Variance} = \text{Var}(r_j) = \frac{\sum_{j=1}^{n} [r_j - E(r_j)]^2}{n-1}$$

OR,

$$\sigma^2_j = \text{Variance} = \text{Var}(r_j) = \frac{\sum_{j=1}^{n} r_j^2 - n(\bar{r}_j)^2}{n-1}$$

Where,

n = Total number of observation of years taken for the study

r_j = Rate of return of j^{th} item

$E(r_j)$ or $\bar{r}_j$ = Expected rate of return of j^{th} item

$\sum$ = Summation

B) Standard Deviation

Standard deviation is most common statistical indicator of an assets risk, it measure the dispersion around the expected value. Take the square root of the variance to obtain the standard deviation. The square root of the variance of the rates of return is called standard deviation of the rates of return. The symbol is σ,

pronounced “Sigma”. It is measure of total risk. It gives us an idea of how far above or below the expected value the actual value is likely to be.

The standard deviation and the variance are equally acceptable and conceptually equivalent quantitative measure of an asset’s total risk. Higher the variance or standard deviation, higher the total risk of a security and vice versa. Standard deviation is calculated using the following formulae.

i) If probability distributions are given

$$\text{Standard deviation} = \sigma = \sqrt{\sum_{j=1}^{n} [r_j - E(r_j)]^2 \times p_j}$$

OR,

$$\text{Standard deviation} = \sigma = \sqrt{\sum_{j=1}^{n} r_j^2 \times p_j - E(r_j)^2}$$

ii) If Probability distributions are not given

$$\text{Standard deviation} = \sigma = \sqrt{\frac{\sum_{j=1}^{n} [r_j - E(r_j)]^2}{n-1}}$$

OR,

$$\text{Standard deviation} = \sigma = \sqrt{\frac{\sum_{j=1}^{n} r_j^2 - n(\bar{r}_j)]^2}{n-1}}$$

Where,

n = Number of years that the returns are taken

r_j = Rate of return of j^{th} item

$E(r_j)$ or $\bar{r}_j$ = Expected rate of return on j^{th} item

P_j = Probability associated with return of investment

$\sum$ = Summation

C) Coefficient of Variation

Standard deviation is an absolute measure of variability; it is generally not suitable for comparing investments with different expected returns. In these cases, the coefficient of variation provides a better measure of risk. For example:

Table No. 4

Assets	σ	E(r)	C.V. [σ/E(r)]	Result
A	20%	25%	0.8	Less risky
B	18%	10%	1.8	More risky

Asset A looks riskier than asset B While comparing the standard deviation but the expected returns of the assets are different. Hence it is not a relative measure, the relative measure can be the coefficient of variation and it shows that asset B is riskier as compared to asset A.

Therefore, coefficient of variation is another useful method of measuring the risk. It is defined as the standard deviation divided by the mean of expected return. It shows the risk per unit of return, and it provides a more meaning basis for comparison when the expected returns on two alternatives are not the same. The higher the coefficient of variation is higher the risks and vice versa.

Equal state of return with risk or equal state of risk with return easily compares but with different state of risk and return of assets we have to find out coefficient of variation. Symbolically, coefficient of variation can be expressed as follows:

$$\text{Coefficient of variation} = C.V_j = \frac{\pm_j}{E(r_j)}$$

A project with a low C.V. has less risk per unit than a project with a high C.V.

Where,

$C.V._j$ = Coefficient of variation of j^{th} item

σ_j = Standard deviation of j^{th} item

$E(r_j)$ = Expected return of j^{th} item

D) Beta

Beta is also another measure of risk. It measures non-diversifiable risk. It shows how the price of a security responds to market forces. In other word, it reveals what change is come in the rate of return of security when market rate of return is changed. Beta may be positive or negative. If it comes in positive, it means rate of return of security increases due to market return increases. But when market return is decreased, return of stock is also decreased. If beta increases then risk in the stock is also increased. The capital assets pricing model (CAPM) uses beta to relate an asset's risk relative to the market to the asset's required return.

Beta is calculated by relating the returns on a security with the returns for the market. Market return is measured by the average return of a large sample of stocks; such as the $ and p 500 stock index. The beta for the overall market is equal to 1.00 and other betas are viewed in relation to this value. Moreover, it has been explained in further topic "Theories of Risk and Return" under this chapter – II

2.2.7 Sources of Investment Risk

Why do the actual returns deviate from an expected return? Various factors play roles to make the actual return differ from expected return and such factors are known as sources of investment risk. Every investment has uncertainties. Uncertainties make future investment return risky. The sources of uncertainty that contribute to investment risk are as follows:

I) Liquidity Risk

Liquidity risk is associated with uncertainty created by the inability to sell the investment quickly for cash. The return variability will increase if price discounts and sales commission are to be given in order to liquidate assets in time. The less the liquidity, the greater will be the risk. So, two factors - price and time - are associated with liquidity.

II) Interest Rate Risk

It is the potential variability of a return caused by changes in the market interest rates. Market interest rate influences the value of an asset and hence its return. If the market interest rate rises, the value of an asset (Bond) will decrease. A higher interest rate means a higher discount rate and a higher discount rate causes a lower present value of any asset.

III) Default Risk

Default risk is related to the probability that some or all of the initial investment will not be returned. The degree of default risk is closely related to the financial condition of the company issuing the security and the security is ranked in claims on assets in the event of a default or bankruptcy.

IV) Call ability Risk

Some securities are issued with a call provision i.e. a company may call back the securities issued before their maturity. The call ability risk is the portion of a securities total variability of return that derives from the possibility that the issue may be called.

V) Convertibility Risk

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

investment may be converted into the issuer's common stock at a time or under terms harmful to the investor's best interests.

VI) Bull-Bear Market Risk

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

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

VII) Industry Risk

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

VIII) Management Risk

A company's management and Board of Directors are involved in the decisions ranging from product innovation and production methods to financing and acquisitions. All these decisions made by the management materially affect the risk faced by investors. Sometimes, the management may make a decision, which turns out to be wrong later on. Due to the poor management of firm or organization this wrong decision appears there. Management errors are difficult to analyze, investors can reduce their risk by buying shares in those corporations in which the executives have the significant equity investment instead of buying shares in the corporation in which executives have no equity investment.

IX) Political Risk

Political risk is the portion of assets' total variability of return caused by changes in the political environment (domestic and international as well as the internal changes of the company).

X) Purchasing Power Risk

It is the variability of return an investor suffers because of inflation. The inflation is the percentage change in the consumer price index (CPI) over a period. When inflation takes place, financial assets (such as cash, stocks and bonds) may lose their ability to command the same amount of real goods and services they did in the past. To put another way, the real rate of return on financial assets may not adequately compensate the holder of financial assets for inflation. Economists measure the rate of inflation by using a price index.

2.2.8 Techniques Used for Evaluation of Risk

I) Sensitivity Analysis

It is technique used to determine which of the many variables are the most critical for the success or failure of a project. Variable that are commonly analyzed include raw material cost, sale value, selling price, other variable costs, project life, plant capacity etc. After identification of the critical factors, the project life appraiser asks the question, “What happens if we change one or more variables in the project”? This will help him or her to ascertain the intrinsic strength of the unit. For instance, what happens if the sales volume goes down by 5 percent or if the price of raw material goes up by 5 percent or what happens if both of them occur together? Higher the sensitivity of operation and profitability of a unit to the variation in the critical factors is greater the risk.

II) Certainty Equivalent Method

In this approach, the risk cash flows are converted to a risk-less or certain equivalent value. This conversion is normally done with a hypothetical assumption regarding the future inflow of funds. The greater the risk of an expected cash flow, the smaller will be the certainty equivalent value.

III) Adjustment of Discount Rate

Under this method, a premium equivalent to the risk element is added to the given discount rate and then net present value (NPV) is computed, which gives an indication of the extent of risk coverage. This gives a fairly good idea regarding the risk absorption capacity of the proposed unit. In order to decide the exact premium to be added one can take to help of capital asset pricing model (CAPM).

IV) Predetermined Payback Period

Under this method, a predetermined maximum payback period is fixed and a project's cash flows are computed with reference to that period. However for very high-intensive projects this approach may not be realistic.

V) Statistical Techniques

Probability estimates of cash flow, dispersion of returns, computation of variance or standard deviation of NPV, simulation modeling etc. are some of the complex statistical techniques used for evaluating project risks. However, considering the time constraint these techniques are hardly used except for very large projects.

VI) Financial Analysis

By applying various appraisal techniques, the degree or extent of risk in different categories can be evaluated to a reasonable extent. However, all risks are, to certain extent, interdependent to each other. For example, high business risk leads to high financial risk and also to high default risk. Again high financial risk leads to high default risk. Similarly high cost base leads to high financial risk and also so

high default risk. Further, high fiduciary risk leads to high financial risk and also to high default risk.

Thus, the loan appraiser's responsibility is to ensure an optimum balance in all "Five legs" of risk and reduce the risk by suggesting suitable alternatives to the entrepreneur.

VII) Credit Review System

The nature of credit review systems may base on institution's size, complexity and management practice. For example, a credit review system may include components of a review system: may include components of a traditional credit review function that is independent of the lending function. The use of the firm "credit review system" can refer to various responsibilities assigned to credit administration, loan administration, problem loan workout or other areas.

2.2.9 Investment Decision Based on Expected Return and Risk

A rational investor always wants to maximize the return at the minimum level of risk. And this investment decision based on expected return and risk is also made according to dominance principle. So, the investor wants to select dominant assets to invest and such dominant assets may have any of the following features:

(I) Maximum return at any selected level of risk.

Example:

Table No. 5

Stock	E(r)	σ	Decision
A	12%	6%	The total risks of both stocks are equal but stock A has a higher return. Therefore stock A is a dominant asset and this dominates stock B on the basis of return. A rational investor selects stock A.
B	8	6	

(II) Minimum risk at any level of expected return

Example:

Table No. 6

Stock	E(r)	σ	Decision
P	15%	12%	The expected returns of both the stocks are the same but the risk of stock Q is less than that of stock P. Therefore, stock Q is a dominant stock and this dominates stock P on the basis of the risk.
Q	15	10	

(IIII) If the expected return and risk both are not equal or if the above situations do not occur, an investor bases his decision on the coefficient of variance (C.V.).

Example:

Table No. 7

Stock	E(r)	σ	C.V.=[σ/E(r)]	Decision
R	10%	8%	0.80	An investor selects stock R as it has less risk on per unit return.
S	12	11	0.92	

Where E(r) is the expected or average or mean return and σ is the standard deviation.

2.2.10 Investor's Nature and Return-Risk Trade Off

Investors are categorized on the basis of risk bearing nature: risk averse, medium and risk taker (lover). How do they select securities according to risk return trade off? The example given in the table number 8 tries to answer the question.

Table No. 8

Securities	Expected return, E(r)	Standard deviation, σ	Dominated?
A	7%	5%	No
B	7	8	By A
C	10	12	By D
D	12	12	No
E	14	14	No

Risk Return Trade off Graph

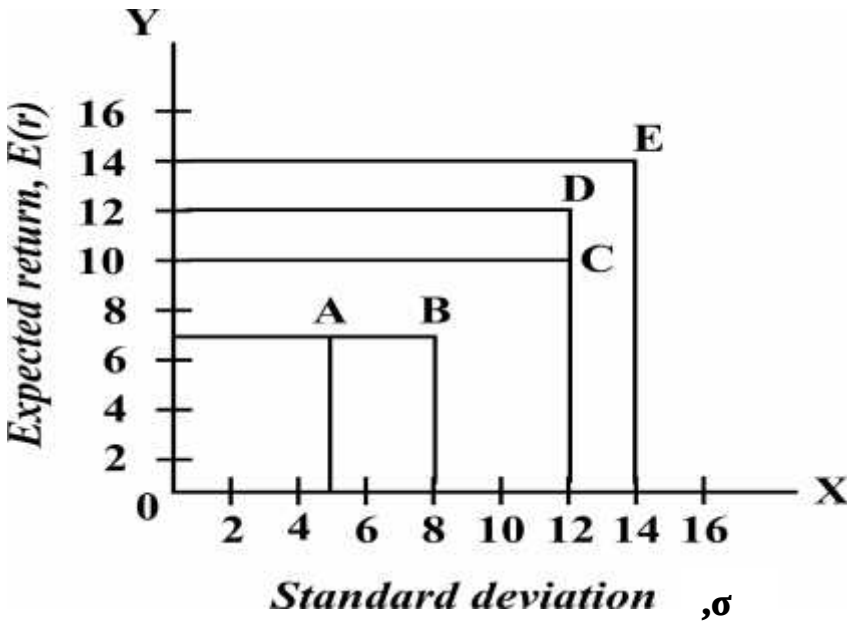


Figure No. 1

Among the given securities, security A and security D are dominant securities and these securities dominate security B and security C respectively. Security E

neither dominates nor is dominated by any other security. To invest in the given securities, an investor can purchase either security A, D or E. This depends upon his or her risk bearing nature. A risk averse investor invests in security A, medium investor invests in security D and risk taker (lover) invests in security E but according to the principle of dominant assets, a rational investor invests all of his or her fund in security A because there is similar return with lower risk. Similarly, he she invests in security D because security D has higher expected return with similar risk.

2.2.11 Theories of Risk and Return

Any theory based on the concept of risk and return is known as risk and return theory. There are some important theories about risk and return. Among them, Portfolio Theory, Capital Market Theory and Capital Asset Pricing Model (CAPM) or Security Market Line (SML) are the most important and popular theories used in the investment decision making.

2.2.12 Concept of Portfolio Theory

Investment in two or more than two securities is known as portfolio. In other words portfolio is the combination of investment in financial assets i.e. bond, stock. For example, if an investor invests 50%, 30% and 20% of his/her fund in the share of company A, B and C respectively, this group of securities is called portfolio and shown in the figure number 2.

Pie Diagram Showing the Investment Portfolio

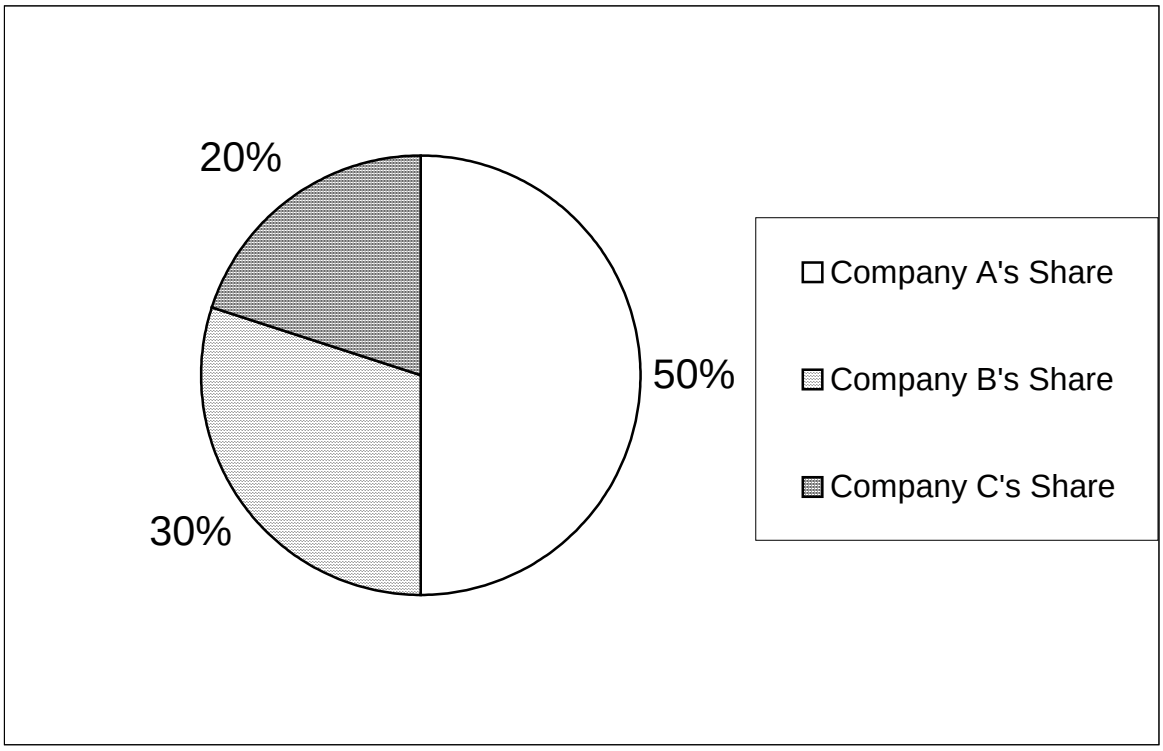


Figure No. 2

An investor wants to maximize the returns from his or her investment for a given level of risk. So, he or she always tries to maximize the return and minimize the risk. Portfolio theory describes how the risk of the investment is reduced and how the return of investment is increased. In other words portfolio helps in diversifying the risk. To invest in only one security is risky because if the investment is worthless, the investor has to bear heavy loss. This is because to diversify the risk of investment an investor invests his or her fund in more than one security. This collection of securities is called portfolio. Portfolio theory considers the determination of future risks and returns in holding various blends of securities. Portfolio return shows not only the average rate of return of any security but also the average rate of return of all securities within the portfolio. Likewise portfolio risk reveals the average risk of all securities held in a portfolio. The primary objective of portfolio theory is to maximize return and to minimize risk. And its secondary

objectives are regular return, stable income, appreciation of capital, ever liquidity, easy marketability, safety of investment, tax benefits etc.

Portfolio theory is a normative theory. Normative means “Normal” or “Standard”. In economics a normative theory refers to the normal way of consumer behavior. Accordingly, portfolio theory delineates the decisions that will be made by a population of normal investors-each exercising his or her personal preference. Thus, the portfolio theory provides a normative approach to the investor decision to invest in securities or assets under risk.

2.2.13 Assumption of Portfolio Theory

A portfolio is a combination of investment assets. Portfolio theory shows how an investor can reach in his optimal portfolio position. Portfolio theory is a defensive technique to counter the problem of investment risk. Portfolio performance coincides without intuitive risk ranking. The assumptions of portfolio theory are given hereunder.

(I) Investors are basically risk averse. But there are some investors who prefer risk to return. Risk aversion means the investor who prefers less risk to high risk or prefers more return to less return.

“Alternatively, an individual is said to be risk averse if the utility of expected wealth is greater than the expected utility of wealth, i.e.

$$U [E (W) > E [U (W)] \quad — \quad \text{Risk Aversion}$$

Similarly, if the utility of expected wealth is equal to the expected utility of wealth, then investor is said to be risk neutral, i.e.

$$U [E (W)] = E [U (W)] \quad — \quad \text{Risk Neutrality}$$

Finally, an investor is said to be risk seeking if the utility of expected wealth is less than expected utility of wealth, i.e.

U [E (W)] < E [U (W)] — Risk seeking"[15]

(II) The expected return of a portfolio is the mean of probability distribution of the portfolio. Symbolically,

$$E(r_p) = \sum_{jX1}^{n} r_j \mid p_j$$

Where,

$E(r_p)$ = Expected return of a portfolio

r_j = Return of j^{th} item or asset

p_j = Probability of j^{th} item

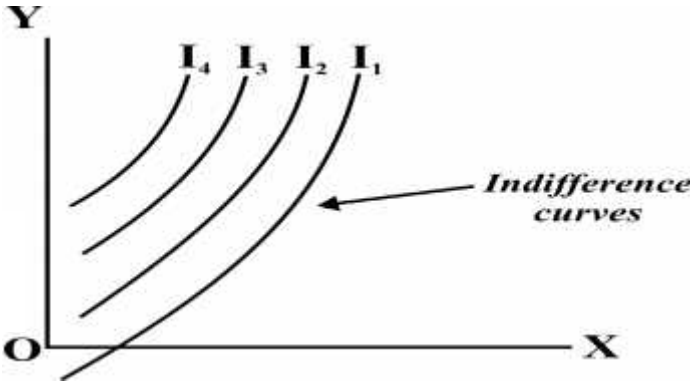
n = Number of periods

$\sum$ = Summation

(III) The risk of a portfolio can be estimated in terms of the variability of returns (i.e. variance or standard deviation).

(IV) The investors select a portfolio on the basis of estimation of returns and risk. This means, the utility or indifference curve is the function of risk and return of a portfolio.

Mean variance Indifference Curves



Risk, σ

Figure No.3

[15] Peterson and Lewis, 2001, P. 470.

(V) Investors follow dominance principle. It means investors prefer a portfolio which has high return or low risk to another portfolio.

2.2.14 Forms of Diversification of portfolio

Diversification of portfolio helps to minimize risk and different diversification techniques have been developed for reducing portfolio's risk.

(I) Simple Diversification

Simple diversification is defined as not putting all the eggs in one basket. Under this diversification securities are selected randomly and are provided equal weight. If we add 10 to15 assets in our portfolio then we can minimize the portfolio's total risk to the undiversifiable level. The following figure clarifies more about it.

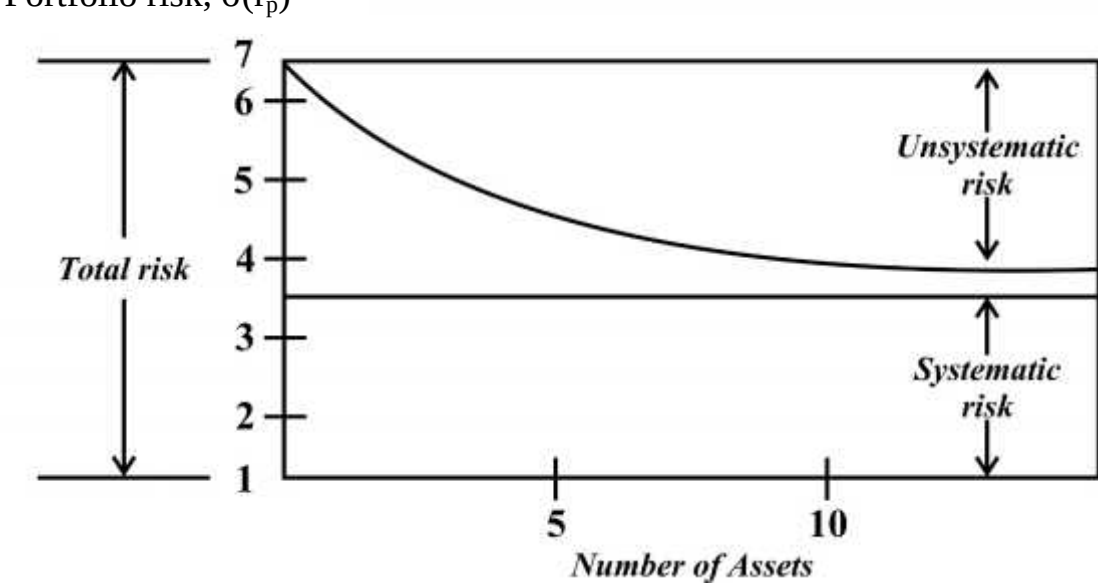


Figure No.4

(II) Superfluous Diversification

Under a simple diversification a maximum risk reduction is attained through the inclusion of 10 to 15 assets in the portfolio. If we add further more assets in the portfolio, such diversification is called superfluous diversification, no further risk

reduction is possible but instead it arouses more portfolio management problems like high research cost, high transactions costs, impossibility of good portfolio management etc. The performance of portfolio will not improve and will lower the net return to the investor. Hence, the superfluous diversification should be avoided.

(III) Diversification across Industries

Another technique to diversify the portfolio is diversification across industries. Under this technique, assets in the portfolio are selected from different industries rather than from one industry. We can diversify our portfolio for selecting securities from different sectors (industries) rather than selecting from one. This type of diversification is called diversification across industries. We diversify our portfolio to minimize the total risk, though many empirical researches have shown that diversifying across industries is not much better than selecting securities randomly.

(IV) Simple Diversification across Quality Rating Categories

Under a simple diversification across quality rating categories, we select assets randomly from the homogeneous quality ratings. The highest quality portfolio of randomly diversified stocks will be able to achieve lower levels of risk than the simple diversified portfolio of lower quality stocks.

(V) Markowitz Diversification

A more analytical technique to diversify a portfolio is Markowitz diversification. Harry M. Markowitz developed this theory of diversification in 1952 A.D. This is also called the modern theory of portfolio management. The basic portfolio model was developed by Harry Markowitz, who derived the expected rate of return for a portfolio of assets and an expected risk measure.

Markowitz diversification is based on the correlation. Under this theory, if portfolio is made by combining assets which are less than perfectly positively correlated (+1), the reduction in risk is possible without sacrificing portfolio returns. The lower the correlation between assets, the more the Markowitz diversification will be able to reduce the portfolio's risk. If the assets are perfectly negatively correlated (−1), the risk less portfolio is possible.

Many portfolios can be made through our limited fund but our preference goes to select portfolio having a higher level of return at a given level of risk. Therefore trade off is required between the risk and return of portfolio. To select the efficient portfolio, we need first to calculate the expected return and risk of the portfolio.

Basic assumptions of Markowitz Model

I. Investors consider each investment alternative as being represented by a probability distribution of expected returns over some holding period.
II. Investors maximize one-period expected utility, and their utility curves demonstrate diminishing marginal utility of wealth.
III. Investors estimate the risk of the portfolio on the basis of the variability of expected returns.
IV. Investors base decisions solely on expected return and risk, so their utility curves are a function of expected return and the expected variance (or standard deviation) of returns only.
V. For a given risk level, investors prefer higher returns to lower returns. Similarly, for a given level of expected return, investors prefer less risk to more risk.

2.2.15 Covariance between the Return on Two Securities

The covariance is an absolute (as apposed to relative) measure of the degree of relationship between the returns a pair of securities. In other words, covariance is the joint variance of any two securities. It is a statistical measure of the relationship between two random variables. That is, it is a measure of how two random variables, such as the return on securities i and j, move together. A positive value for the covariance indicates that the securities' returns tend to move in the same direction. A negative value of the covariance indicates the return of securities move in the opposite direction and the zero value of the covariance indicates no relationship between the securities' return. The covariance between the securities' return can be calculated by using the following equation:

I. If probability distributions are given

$$\text{Cov}(r_i, r_j) = \sum_{s=1}^{n} [r_i - E(r_i)]\,[r_j - E(r_j)] \times P_s$$

OR,

$$\text{Cov}(r_i, r_j) = \sum_{s=1}^{n} (r_i \times r_j) \times P_s - (\bar{r}_i \mid \bar{r}_j)$$

II. If probability distributions are not given

$$\text{Cov}(r_i, r_j) = \frac{\sum_{s=1}^{n} [r_i - E(r_i)][r_j - E(r_j)]}{n - 1}$$

OR,

$$\text{Cov}(r_i, r_j) = \frac{\sum_{s=1}^{n} (r_i \mid r_j) - n(\bar{r}_i \mid \bar{r}_j)}{n - 1}$$

III. If standard deviation (σ) and correlation coefficient for the securities i and j (r_{ij} or ρ_{ij}) are given

$$\text{Cov}(r_i, r_j) = r_{ij} \times \sigma_i \times \sigma_j$$

Where,

$\text{Cov}(r_i, r_j)$ = Covariance between the return on securities i & j

r_i, r_j = Single period return on securities i and j

$E(r)$ or $\overset{z}{r}$ = Expected rate of return

n = Number of outcome considered

P_s = Probability of return that the state of nature denoted S occurs

r_{ij} or ρ_{ij} = Correlation coefficient for securities i and j

σ_i and σ_j = Standard deviations of returns for securities i and j

Note: ρ is a Greek letter and pronounced as 'rho'

2.2.16 Correlation Coefficient between Two securities

Correlation coefficient is a relative measure of relationship that is bounded by +1.00 and −1.00. It is a statistical measure of the extent to which the returns on any two securities are related, however, it denotes only association not causation. Covariance and correlation are closely related. The correlation coefficient measures the degree of relationship of movement of return of securities. The square root of the coefficient of determination is called the correlation coefficient. It is defined as the covariance between the dependent and independent variables, divided by the product of their standard deviations,

$$r_{ij} \text{ or } \rho_{ij} = \frac{Cov(r_i, r_j)}{\pm_i \pm_j}$$

]Where,

r_{ij} or ρ_{ij} = Correlation coefficient for securities i and j

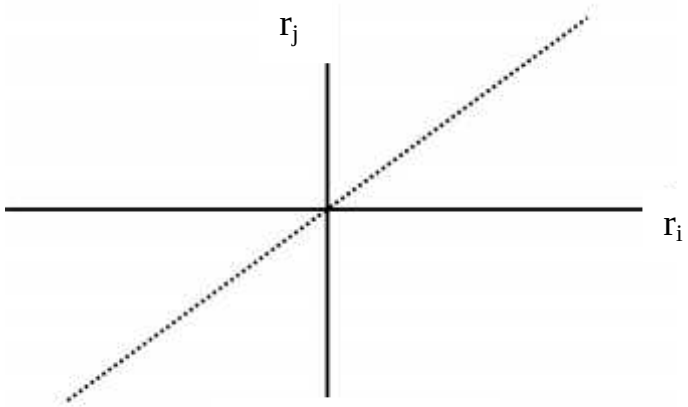
σ_i and σ_j = Standard deviations of returns for securities i & j

$Cov(r_i, r_j)$ = covariance between the return on securities i and j

Using the above equation, correlation is measured. The correlation coefficient always lies between +1.00 and –1.00. A value of +1.00 represents a perfectly positive correlation and value of –1.00 represents a perfectly negative correlation. With zero correlation, there is no relationship between the returns on the two securities. The knowledge of the returns on one security is of no value in predicting the return of second security. Three cases of correlation and risk condition have been presented below:

Case 1: Perfect Positive Correlation (r_{ij}= + 1.00)

Returns on two perfectly positively correlated securities would move up and down together and a portfolio consisting of two such securities would be exactly as risk as the individual security. Thus, diversification does nothing to reduce risk if the portfolio consists of perfectly positively correlated security. This first case can be clarified using the following figure.



r_{ij}=1.00

Figure No.5

Where, r_i and r_j are the returns for securities i and j. If the slop of the line passing through all the observations is positive, we have perfect positive correlation. If it is negative, we have perfect negative correlation. It is seen in the figure number 5 that all the points lie precisely on a straight upward sloping line. This means that when one of the two securities has a relatively high return, then the other will have also same. Similarly, when one of the two securities has a relatively low return, then the other will have also low return.

Case 2: Perfect Negatively Correlation (r_{ij}=–1.00)

Returns on two perfectly negatively correlated securities would move perfectly together but in exactly opposite directions. In this condition, risk can be completely eliminated. Perfect negative correlation almost never found in the real world. This second case can be explained with the help of following figure.

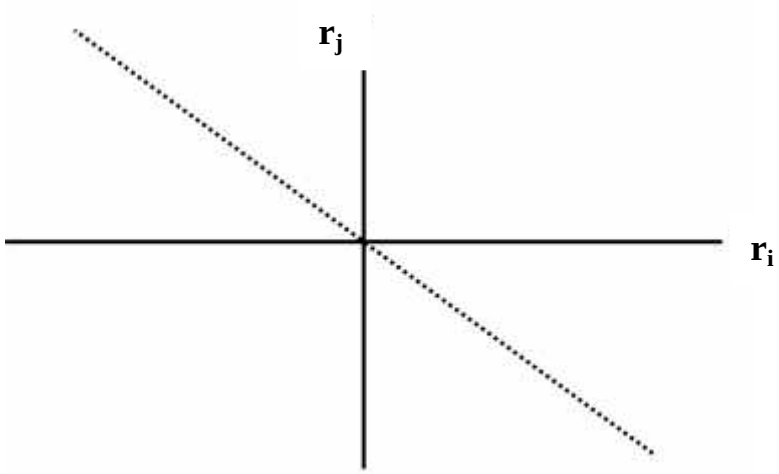


Figure No.6

Where r_{ij} is the correlation coefficient for securities i and j, r_i and r_j are the returns for securities i and j. The returns on the two securities will have a perfectly negative

correlation when the diagram shows that the points lie precisely on a straight downward sloping line as shown in figure number 6. In such a case the returns on the two securities can be seen to move opposite to each other. That is, when one security has a relatively high return, then the other will have a relatively how return.

Case 3: No Relationship between Returns ($r_{ij} = 0$)

When the correlation between two securities is exactly zero, there is no relationship between the returns. They are independent of each other. In this condition, some risk can be reduced. This third case can also be clarified with the help of following figure.

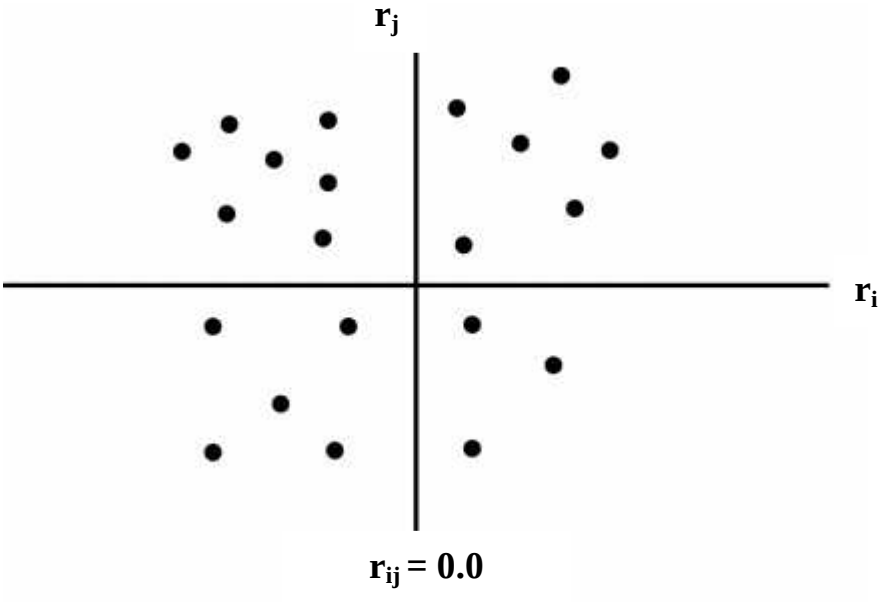


Figure No.7

Where r_i and r_j are the returns for securities i and j, r_{ij} is the correlation coefficient for securities i and j. In figure number 7 the returns of securities show a dispersion that cannot be represented even approximately by an upward sloping or downward sloping line. In such an instance, the returns are uncorrelated, meaning that the correlation coefficient is zero. In this situation, when one security has a relatively high return then the other can have either a relatively high, low or average return.

Virtually, most projects are positively correlated but not perfectly correlated. The degree of the inter-correlation among projects depends upon economic factors, and these factors are usually amenable to analysis. The returns on investments in projects are closely related to the firm's basis products and markets will be ordinarily be highly correlated with returns on the remainder of the firm's assets and such investments will not generally reduce the risk of firm. However, investment in other product lines and in other geographic markets may have a low degree of correlation with other components of the firm and may therefore reduce overall risk. Accordingly, if returns of an asset are not too closely related with other major asset (or better still, are negatively correlated with other investments); this asset is more valuable to a risk-averting firm than in a similar asset whose returns are positively correlated with the bulk of the asset.

2.2.17 Significance of Correlation Coefficient in Portfolio

The correlation coefficient plays an important role in a portfolio diversification. Because of the correlation effect between and among the assets investors are able to minimize the total risk of their investment than in a single asset. The portfolio of asset that is less correlated or negatively correlated will have less portfolio risk than the portfolio of asset with a highly positive correlation. If portfolio is made with perfectly positively correlated assets, if the total portfolio risk is the highest and if the portfolio is made with perfectly negatively correlated assets, the portfolio risk will be almost equal to zero.

2.2.18 Measurement of Portfolio Return

Portfolio is the combination of two or more than two securities or assets to diversify the risk and maximize the return. In other words, portfolio is the best way to combine two or more than two securities to minimize the risk and maximize the

return. The investment in only one asset is risky. Since the investor prefers to diversify investment into various assets. It is the act of keeping the eggs in different basket. The damage of an egg may damage the other eggs also. It means one security may loss and other may earn return. Thus, portfolio return is defined as the weighted average expected returns of assets or securities included in the portfolio. The rate of return on a portfolio is always a weighted average of the returns of the individual securities in the portfolio. The portfolio return depends on how much fund is invested to each type of security. "The expected return on a portfolio may be defined as the weighted average of the expected return on the assets, which comprise portfolio. The weights reflect the proportion of the portfolio or wealth invested in each asset."[16]

The portfolio return is calculated as follows:

$$\hat{r}_p \text{ or } \bar{r}_p \text{ or } E(r_p) = \sum_{i=1}^{n} w_i E(r_i)$$

OR,

$$= W_1E(r_1) + W_2 E(r_2) + \ldots\ldots\ldots\ldots + W_n E(r_n)$$

Where,

$\hat{r}_p$ or $\bar{r}_p$ or $E(r_p)$ = Expected return of portfolio

W_i = Proportion or weight of fund invested in i^{th} security or asset

$E(r_i)$ = Expected return of i^{th} security or asset

n = Number of securities included in the portfolio

W_1 and W_2 = Proportion or weight of fund invested in security 1 and security 2

[16] Padam Raj Joshi, *Fundamentals of Financial Management*, 1st Edition, Asmita Books Publishers and Distributors, Kathmandu, Nepal, 2004, P. 134.

$E(r_1)$ and $E(r_2)$ = Expected return of security 1 and security 2

W_n = Proportion or weight of investment in n^{th} security

$E(r_n)$ = Expected return of n^{th} security

2.2.19 Measurement of Portfolio Risk

Expected risk on portfolio is a function of the portion of invested in the components, the riskiness of the company and correlation of return on the components securities. In other words, portfolio risk is the weighted average risk of returns of individual securities combined in the portfolio and the movement of returns of those securities. Moreover, it is the variation in expected return from investment in two or more than two securities or assets. It depends upon the three fundamental factors. The first one is individual risk of a security; second one is the proportion or weight of investment in each security and third is the relation between the co-movement of return of securities among the portfolio called covariance or correlation. Portfolio return is only the weighted average of return and proportion of investment. But portfolio risk is the combination of individual securities risk, proportion of investment and nature of securities return forming in portfolio. The riskiness of a portfolio, as in the case of individual assets or securities, is measured by the variance or standard deviation of the portfolio rate or return. The variance of the portfolio is the square of the standard deviation. High standard deviation of portfolio (σ_p) indicates high degree of portfolio risk and vice versa.

The following equations explain the variance and the standard deviation of portfolio in simple way.

i) If portfolio is made with two securities A and B

$$\pm {}^{2}_{p} X \pm {}^{2}_{A} w^{2}_{A} \Gamma \pm {}^{2}_{B} w^{2}_{B} \Gamma 2 \, Cov_{AB} W_A W_B$$

$\pm^2_p = X\pm^2_A w^2_A \Gamma \pm^2_B w^2_B \Gamma 2\ r_{AB}\ \boldsymbol{\sigma}_A \boldsymbol{\sigma}_B W_A W_B$

$\sigma_p = \sqrt{\pm^2_A w^2_A \Gamma \pm^2_B w^2_B \Gamma 2 Cov_{AB} W_A W_B}$

OR,

$\sigma_p = \sqrt{\pm^2_A w^2_A \Gamma \pm^2_B w^2_B \Gamma 2 \circ_{AB} \pm_A \pm_B W_A W_B}$

ii) If portfolio is made with three securities A, B and C

$\pm^2_p = X\pm^2_A w^2_A \Gamma \pm^2_B w^2_B \Gamma \pm^2_C w^2_C \Gamma 2\, Cov_{AB}\, W_A W_B + 2Cov_{AC} W_A W_C + 2Cov_{BC} W_B W_C$

OR,

$\pm^2_p = X\pm^2_A w^2_A \Gamma \pm^2_B w^2_B \Gamma \pm^2_C w^2_C \Gamma 2\, \rho_{AB}\sigma_A\sigma_B W_A W_B + 2\rho_{AC}\sigma_A\sigma_C W_A W_C + 2\rho_{BC}\sigma_B\sigma_C W_B W_C$

$\sigma_p = \sqrt{\pm^2_A w^2_A \Gamma \pm^2_B w^2_B \Gamma \pm^2_C w^2_C \Gamma 2 Cov_{AB} W_A W_B \Gamma 2 Cov_{AC} W_A W_C \Gamma 2 Cov_{BC} W_B W_C}$

OR,

$\sigma_p = \sqrt{\pm^2_A W^2_A \Gamma \pm^2_B W^2_B \Gamma \pm^2_C W^2_C \Gamma 2 \circ_{AB} \pm_A \pm_B W_A W_B \Gamma 2 \circ_{AC} \pm_A \pm_C W_A W_C \Gamma 2 \circ_{BC} \pm_B \pm_C W_B W_C}$

Where,

σ^2_p = Variance of portfolio

σ_p = Standard deviation of portfolio

σ^2_A, σ^2_B and σ^2_c = variance of securities A,B and C

σ_A, σ_B and σ_C = Standard deviation of securities A, B and C

Cov_{AB} = Covariance between securities A and B

Cov_{AC} = Covariance between securities A and C

Cov_{BC} = Covariance between securities **B** and C

ρ_{AB} or r_{AB} = Correlation coefficient between securities A and B

ρ_{AC} or r_{AC} = Correlation coefficient between securities A and C

ρ_{BC} or r_{BC} = Correlation coefficient between securities B and C

W_A, W_B and W_C = Weight or proportion of investment in securities A, B and C

$\sqrt{\ }$ = Square root

2.2.20 Minimum Variance Portfolio, Minimum Risk Portfolio, Zero Risk Portfolio, Optimal Weight or Risk Minimizing Weight

It is the portfolio with the lowest level of risk in the efficient frontier. It is a difficult question that what amount of fund (i.e. percentage of fund) to invest in a particular security or asset to reduce risk. The concept of standard deviation and correlation between the returns of the given securities or assets attempt to solve such a problem. In the case of two securities or assets portfolio, the optimal weight to invest in securities x and y are calculated as follows:

$$W_x = \frac{\sigma_y^2 - Cov_{xy}}{\sigma_x^2 + \sigma_y^2 - 2Cov_{xy}} X \frac{\sigma_y^2 - \rho_{xy}\sigma_x\sigma_y}{\sigma_x^2 + \sigma_y^2 - 2\rho_{xy}\sigma_x\sigma_y}$$

Similarly, the weight (or percentage) of security **y** can also be obtained by using the following formula.

$$W_y = \frac{\sigma_x^2 - Cov_{xy}}{\sigma_x^2 + \sigma_y^2 - 2Cov_{xy}} X \frac{\sigma_x^2 - \rho_{xy}\sigma_x\sigma_y}{\sigma_x^2 + \sigma_y^2 - 2\rho_{xy}\sigma_x\sigma_y}$$

OR, $W_y = 1 - W_x$

By using above formula, one can easily obtain the weights (i.e. percentage) that are invested in the two securities x and y.

Where,

W_x and W_y = Optimal weight to invest in securities x and y

σ^2_x = Variance of the return of security x

σ^2_y = Variance of the return of security y

Cov_{xy} = Covariance between securities x and y

ρ_{xy} =Correlation coefficient between securities x and y

σ_x and σ_y = Standard deviation for securities x and y

2.2.21 The Portfolio Risk and Return N Assets Case

An investor may make a number of possible portfolios out of the N risky assets. Selection of an ideal portfolio depends on the mean rate of return and the standard deviation of the returns in the portfolio concerned. Portfolio risk and return analysis of N asset case also involves in the computation of mean, variance, and covariance between the returns which is quite difficult in the computation and may require a computer. Nevertheless some of the methods are summarized below.

Symbolically,

$$E(r_p) = \sum_{i=1}^{n} w_i E(r)_i$$

OR,

$$E(r_p) = W_1E(r_1) + W_2E(r_2) + \ldots\ldots\ldots\ldots\ldots + W_nE(r_n)$$

Where,

$E(r_p)$ = Expected portfolio return

i = Number of assets held in a portfolio

W_i = Weights of i^{th} assets in a portfolio

$E(r_i)$ = Expected returns of i^{th} assets in a portfolio

The variance (or standard deviation) involves a rather complex computation aspect, when the number of assets increase in a portfolio, the standard deviation can be expressed by,

$$\sigma_p = \sqrt{\sum_{i=1}^{n} W_i^2 \sigma_i^2 + 2 \sum_{i=1}^{N-1} \sum_{j=1}^{N-1} W_i W_j \rho_{ij} \sigma_i \sigma_j}$$

Here, W_i is the proportion of the investment allocated to assets i, w_j is the proportion allocated to asset j, ρ_{ij} is the correlation coefficient between asset i and asset j, and N is the number of securities contained in the portfolio.

Since this formula has N assets. The covariance terms increases quadratically as the number of assets increases, the equation becomes quite complex if N is large.

2.2.22 Portfolio Analysis With Negative Weights

Portfolio is a collection of assets or a combination of investments. When we invest our fund into different securities, the weight of each security is the positive weight. For example, suppose Mr. X has Rs. 10,000 investment fund. If he invests Rs. 4,000 in stock A and the rest in stock B, then the weight of stock A (40%) and the weight of stock B(60%) are the positive weights. But if Mr. X borrows Rs. 5,000 from stock B and invests all the funds (Rs. 10,000 + Rs. 5,000) in stock A, then the weight of stock B is the negative weight. It is also noted that the amount borrowed from stock B is the sales proceeds received from short sale of stock B. For example,

Total fund available = Rs. 10,000 + Rs. 5,000 = Rs. 15,000

Total investment fund in stock A = Rs. 15,000

Amount borrowed from stock B = Rs. 5,000

Now,

$$\text{Weight of stock A, } W_A = \frac{Rs.15{,}000}{Rs.10{,}000} \text{X} 1.50 \text{ i.e., } 150\%$$

$$\text{Weight of stock B, } W_B = 1 - W_A = 1 - 1.50 = -0.50 \text{ i.e., } -50\%$$

Portfolio Opportunity Set With Positive Weights

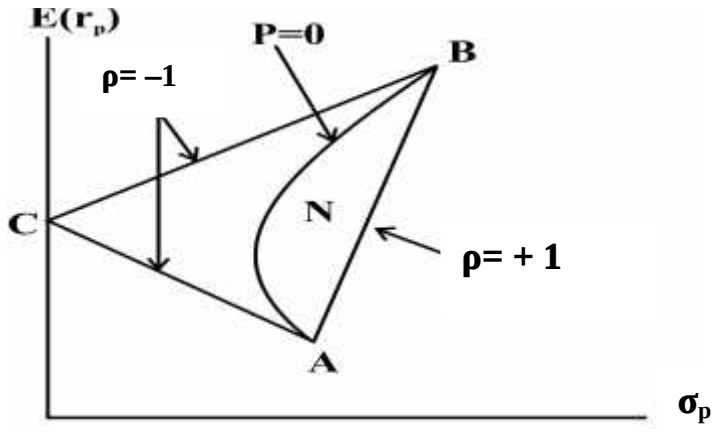


Figure No.8

Portfolio Opportunity Set With Negative Weights

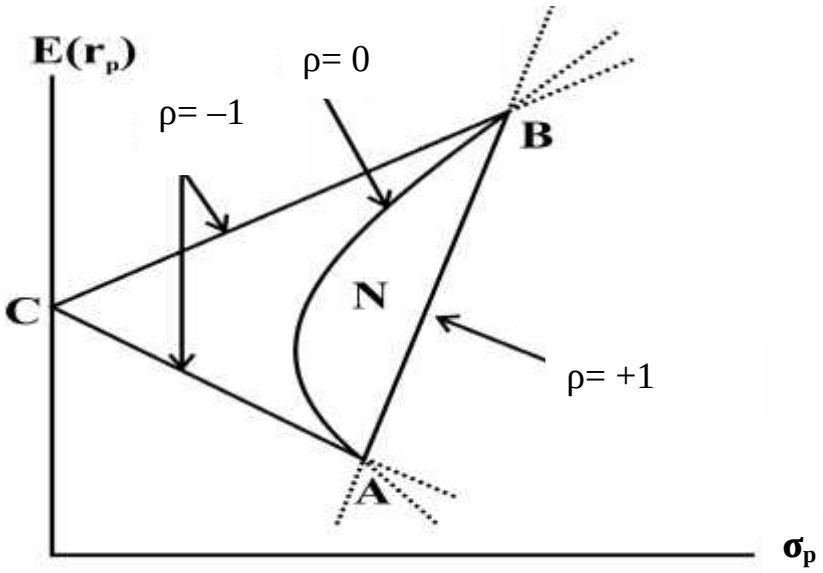


Figure No.9

In the above figures, P is correlation, $E(r_p)$ denotes expected return of portfolio and σ_p is standard deviation of portfolio. If we construct a portfolio with only positive weights then such a portfolio is called lending portfolio and if it is constructed with negative weights such a portfolio is called borrowing portfolio. If an asset has a negative weight, two economic interpretations are possible. First, a negative weight can be used to represent a short sale. Second a negative weight may indicate that the investor created a leveraged (or borrowed, or margined) portfolio by selling (or issuing) a security that has the same risk and return statistics as the asset with the negative weight. Weight is always calculated on the basis of one's own fund.

2.2.23 The Efficient Frontier

In the portfolio theory, the principle of dominance and the portfolio, which has the highest expected returns for a given level of risk and the minimum risk for a given level of return, is called an efficient portfolio. The frontier formed the set of efficient portfolio is called efficient frontier. The efficient set of portfolio defines the efficient frontier in risk return space. The efficient frontier dominates all other asset

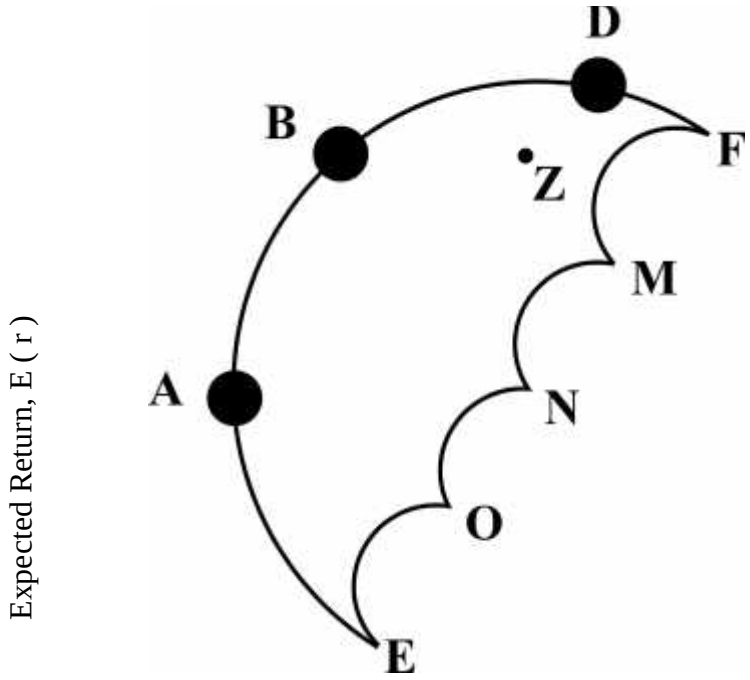


Figure No.10

Above figure have three portfolios (A, B and D). These are regarded as the dominant assets. In the figure number 10, line EF is the efficient frontier and it represents the locus of all portfolios, which have high return for a given level of risk. Portfolios lie below the efficient frontiers are the dominated portfolios. Portfolios that lie to the left side of the efficient frontier are not possible because some other portfolio could provide either a high return with same degree of risk or a lower risk for the same rate of return.

D is the portfolio that provides higher return than portfolio Z with same level of risk, another portfolio B is the portfolio that provides the same return as portfolio Z with less risk because both portfolios D and B lie in efficient frontier.

After the analysis, it is obvious that both the portfolios E and F are equally efficient portfolio. E has low risk with low return while portfolio F has high risk for

high return. Investors select it among these portfolios according to their risk return preference.

Thus, efficient frontier is a curve in which the efficient portfolios lie. It indicates that the portfolio which lies in the efficient frontier curve is more efficient than portfolio, which lies below the curve. Because of lack of perfectly positive correlation the efficient frontier is concave.

2.2.24 Portfolio Selection

There are three steps to select a portfolio by an investor.

I. Determination of Portfolio Opportunities

During the selection of optimum portfolio, at first the investors should determine the portfolio opportunities. Limitless number of portfolio can be combined from the N-assets. Thus, each portfolio has its own the expected return of the portfolio, $E(r_p)$ and standard deviation of the portfolio, σ_p. So, the hypothetical set of all possible portfolios is called the portfolio opportunity set or attainable set.

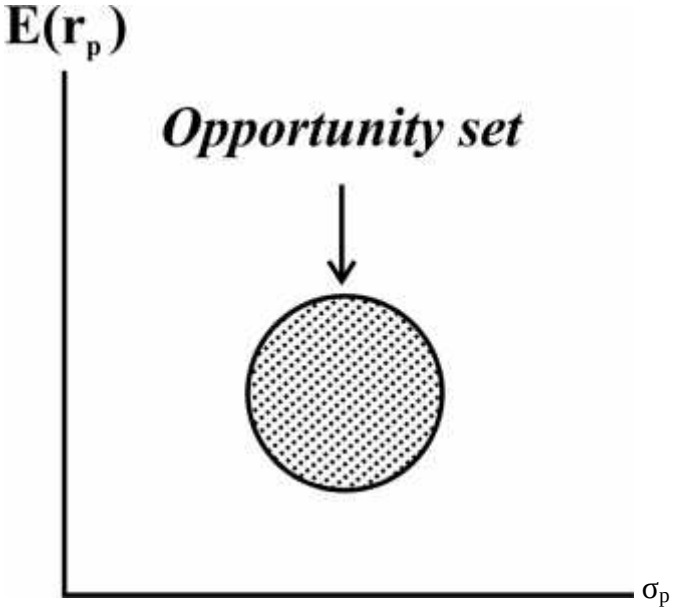


Figure No.11

II. Determination of Efficient Frontier

If we consider the infinite number of portfolios that could be formed form two or more securities and plotted portfolios' expected return and risk, we would create a graph like the one in the figure. The efficient frontier is represented by the line from E to F. Portfolios along curve EF dominate all other investment possibilities. Efficient is such a portfolio which provides the highest possible expected return for any degree of risk or the lowest possible degree of risk for any expected return.

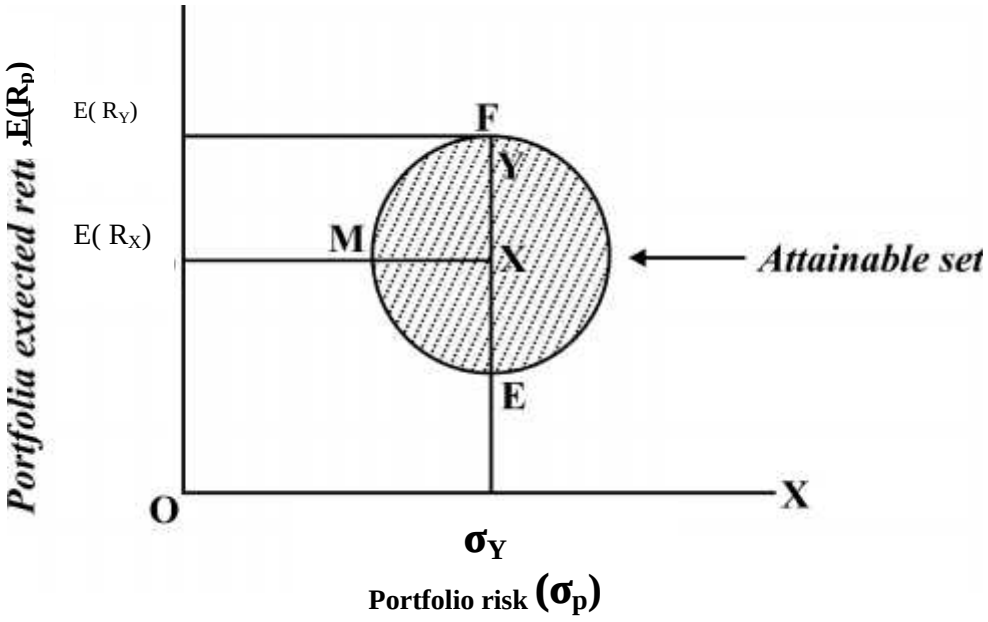


Figure No.12

An efficient frontier or portfolio is a portfolio that provides the highest possible expected return for varying level of risk or the lowest possible degree of risk for varying level of expected return. Portfolios to the left of the efficient frontier are not possible because they lie outside the attainable set. Portfolios to the right of the efficient frontier are inefficient because some other portfolio could provide either a higher return with same degree of risk or a lower risk for the same rate of return. In figure number 12, X is a portfolio which provides

$E(R_x)$ return with σ_y risk and Y is the portfolio which provides $E(R_y)$ return with same level of risk of σ_y and portfolio M provides same return of $E(R_x)$ as portfolio X with less risk than that of portfolio X because both portfolios Y and M lie in efficient frontier.

III. Selection of Optimal Portfolio

After finding the efficient frontier, the investors select the optimal portfolio, which maximizes the utility of investors with the help of indifference curve.

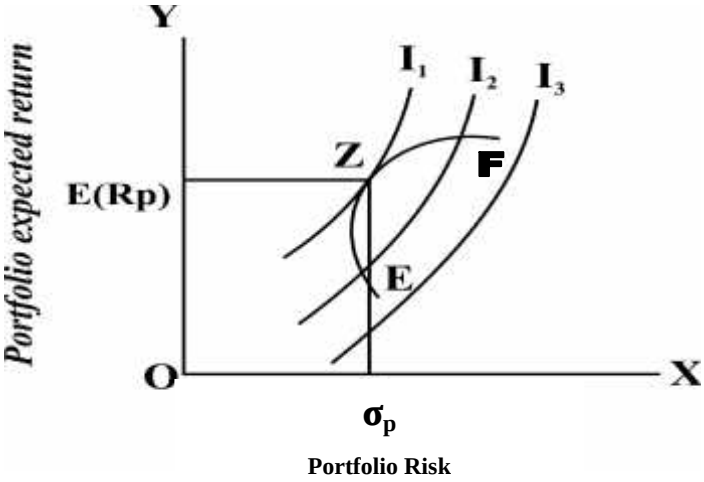


Figure No.13

In the above figure, first indifference curve (I_1) has higher utility than that of second indifference curve (I_2) and third indifference curve (I_3). After finding indifference curve, an investor selects that portfolio, which lies in the efficient frontier of the opportunity, set which touches to the indifference curve of the investor and the portfolio becomes optimal for him or her. The first indifference curve (I_1) has touched to the efficient frontier EF at the point Z. Here optimal portfolio of an investor is Z. Therefore, this point Z makes a highest level of satisfaction for an investor. Thus, an investor selects the portfolio Z.

2.2.25 Portfolio 0f Risky and Risk Free Asset

Portfolios can be made with risk-free and risky assets. Risk-free and risky assets are categorized on the basis of chances of default of an organization. The chances of default of government securities are assumed to be equal to zero. Therefore, the government securities are risk-free securities and the remaining (Corporate) securities are risky securities. Risk-free assets are denoted by RF and risky assets are denoted by M. A portfolio of risky assets is also known as a market portfolio. The market portfolio is a portfolio consisting of all securities where the proportion invested in each security corresponds to its relative market value. The relative market value of a security is simply equal to aggregate market value of the security divided by the sum of the aggregate market values of all securities.

2.2.26 Risk Free Assets

If the investor purchases a risk free asset at the beginning of a holding period then he or she knows exactly what the value of the assets will be at the end of the holding period. As there is no uncertainty about the terminal value of the risk free assets, the standard deviation of the risk-free assets is, by definition, zero

In turn, this means that the co-variance between the rate of return on the risk-free assets and the rate of return on any risky asset is zero.

A risk free asset has by definition a certain return, this type of asset must be some fixed income security with no possibility of default. All corporate securities have some chance of default.

However, not all the securities issued by the government are risk free. The maturity period of government security must match the holding period of an investor. If not, it would create two types of risk one is interest rate risk and another is re-investment rate risk. Any treasury security with a maturity date greater than the investors holding period can not qualify as a risk free asset. In this situation the

interest rate risk creates. Next situation is the securities maturating before the end of the investor's holding period. If it is happened the reinvestment risk is created.

Hence, this leaves only one type of treasury security to qualify as a risk free asset: a treasury security with a maturity that matches the length of the investors holding period. For example, the investor with the three months holding period would find that a treasury bill with a three-month maturity date had a certain return.

Investing in the risk free assets is often referred to as risk free lending, because such an investment involves the purchase of Treasury bills and this involves a loan by the investor to the government.

2.2.27 Concept of Capital Market Theory

When we introduce a risk-free asset into Markowitz portfolio analysis and the following assumptions are taken into consideration, the efficient frontier is changed from a curve to a straight line. This new efficient frontier is called a capital market line (CML). The CML specifies the efficient set of portfolios and an investor can attain by combining a risk-free asset and the risky market portfolio. The CML states that the expected return on any efficient portfolio is equal to the risk less plus a risk premium and thus describes a linear relationship between expected return and risk of portfolio made with risk free assets and risky assets. The assumptions underlying capital market theory are mentioned hereunder.

- Money can be borrowed and lent at the risk-free rate, denoted RF.
- All investors have homogeneous expectations concerning expected returns and risks on securities.
- Investments are infinitely divisible.
- NO taxes or transaction costs exist.
- No inflation exists.
- Capital markets are in equilibrium.

Moreover, the CML can be clarified with the help a figure.

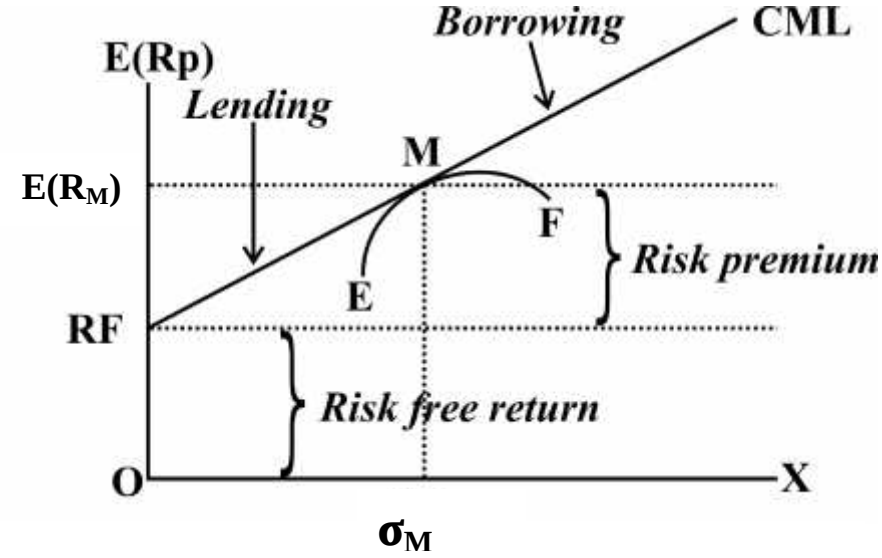


Figure No.14

In the above diagram, $E(R_P)$ is the expected return of the portfolio, σ_P is the portfolio standard deviation, $E(R_M)$ is expected return on market portfolio, EF denotes efficient frontier and σ_M is standard deviation of market portfolio or total risk of market portfolio.

The upward sloping line in the figure number 14 is called the capital market line (CML). The CML stats with the risk-free asset RF and it touches to the risky portfolio M on the Markowitz efficient frontier. Portfolio M is the only risky portfolio. The CML measures total risk of market portfolio.

To the left of M, investors on the CML will hold both the risk-free asset and the risky portfolio. Since these investors are holding part of their investment in RF, they are lending at the rate of RF. All portfolios on the line between RF and M represent lending portfolios.

To the right of M, investors are borrowing at RF and investing more in M by utilizing leverage. Portfolio M is called the market portfolio and contains all

assets. All portfolios on the line that appear after M represents borrowing portfolios.

▒ The Expected Return on a CML Portfolio

$$E(R_P) = W_M \times E(R_M) + W_{RF} \times RF$$

OR,

$$E(R_P) = (1 - W_{RF}) \times E(R_M) + W_{RF} \times RF$$

OR,

$$E(R_P) = W_M \times E(R_M) + (1 - W_M) \times RF$$

Remember !

If value of W_{RF} is given and W_M = ?

then,

$$W_M + W_{RF} = 1$$

$$\text{or, } W_M = 1 - W_{RF}$$

$$\therefore W_M = 1 - W_{RF}$$

If value of W_M is given and W_{RF} =?

then,

$$W_M + W_{RF} = 1$$

$$\text{or, } W_{RF} = 1 - W_M$$

$$\therefore W_{RF} = 1 - W_M$$

▒ The Risk of the CML Portfolio

$$\sigma_P = \sqrt{\pm^2_M W^2_M \Gamma \pm^2_{RF} W^2_{RF} \Gamma 2 \circ_{MRF} \pm_M \pm_{RF} W_M W_{RF}}$$

$$= \sqrt{\pm^{2}_{M} W^{2}_{M} \Gamma O \mid W^{2}_{RF} \Gamma 2 \circ_{MRF} \pm_{M} \mid O \mid W_{M} W_{RF}}$$

$$= \sqrt{\pm^{2}_{M} W^{2}_{M}}$$

… $\sigma_P = \sigma_M W_M$

Note: Risk (standard deviation) of risk free asset equals zero.

Where,

$E(R_P)$ = Expected return on portfolio

$E(R_M)$ = Expected return on market portfolio

RF = Risk free rate of return

W_M = Weight of market portfolio or risky assets

W_{RF} = Weight of risk free assets

σ_P = Standard deviation of returns on the efficient portfolio

σ_M = Standard deviation of return on the market portfolio

σ_{RF} = Standard deviation of return on the risk free assets

ρ_{MRF} = Correlation between the market rate of return and the return on risk free asset

σ^2_M = Variance of return on the market portfolio

σ^2_{RF} = Variance of return on the risk free asset

▒ Slope of CML

Perhaps the most important aspect of the CML is that it describes the market price of risk which will be used by all individuals who make decisions in the face of uncertainty. The slope of capital market line is the market equilibrium price of risk. If somebody wants to invest in the risky portfolio in the market, how much extra return over a risk free rate of return does he require for one unit of market risk that is explained by the slope of CML? This can be calculated as follows.

Slope of CML = $\frac{E(R_M) - RF}{\sigma_M}$

The CML is such a line which expresses the risk and return in the expected portfolio if the proportion of the market portfolio and risk free security or asset is changed. Let us suppose that risk free security return is equal to RF and market expected return is equal to $E(R_M)$ then the investor invests wealth equal to W_M in market portfolio and $1-W_M$ wealth in risk free security. Thus, the expected return and risk of the above portfolios are as follows:

$$E(R_P) = W_M E(R_M) + (1-W_M)RF \text{.....(I)}$$

$$\sigma_P = \sigma_M W_M \text{ .....(II)}$$

From equation (II)

$$W_M = \frac{\sigma_P}{\sigma_M}$$

Putting the value of W_M in equation (i)

$$E(R_P) = \frac{\sigma_P}{\sigma_M} E(R_M) + (1 - \frac{\sigma_P}{\sigma_M}) RF$$

$$= \frac{\sigma_P E(R_M)}{\sigma_M} + \frac{\sigma_M - \sigma_P}{\sigma_M} RF$$

$$= \frac{\sigma_P E(R_M) + RF\sigma_M - RF\sigma_P}{\sigma_M}$$

$$= \frac{\sigma_P E(R_M) - RF\sigma_P + RF\sigma_M}{\sigma_M}$$

$$= \frac{\sigma_P E(R_M) - RF\sigma_P}{\sigma_M} + \frac{RF\sigma_M}{\sigma_M}$$

$$= \frac{\sigma_P [E(R_M) - RF]}{\sigma_M} + RF$$

$$= RF + \frac{[E(R_M) - RF}{\sigma_M} | \sigma_P$$

Therefore, the capital market line (CML) equation is:

$$E(R_P) = RF + \frac{[E(R_M)\ Z\ RF]}{\pm_M} \mid \pm_P$$

Where,

$E(R_P)$ = Required rate of return on any efficient portfolio on the CML

RF = Risk free rate of return

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

σ_M = Standard deviation of returns on the market portfolio

σ_P = Standard deviation of returns on the efficient portfolio

This equation states that the required return on an efficient portfolio in equilibrium is equal to the risk-free rate plus the market price of risk multiplied by the amount of risk on the portfolio being considered.

2.2.28 The Characteristic Line

Before entering into the core subject matter of the characteristic line, at first we have to know about systematic risk and unsystematic risk.

[A] Systematic Risk

Systematic risk is also called factor risk or market risk or beta risk or unavoidable risk or non-diversifiable risk. It is related to macro economic factor. It includes interest rate risk and purchasing power risk which have been already discussed in the chapter number 2.2.7. This risk is that portion of total variability in return caused by market factors that simultaneously affect the prices of all securities. Systematic risk occurs due to the changes in the macro-economic factors like interest rate, inflation, expectations of investors, gross domestic product (GDP) etc. Moreover, it arises because of external environment (political, economic, sociological and technological) of the firm. Therefore, systematic risk is that part of the total risk that can not be eliminated by allocating capital to a diversified portfolio

of investments. A statistical measure of systematic risk index is beta coefficient. Hence we must know about the background of the beta coefficient.

Concept of beta coefficient

In order to assess the systematic risk of an asset, its beta coefficient must be determined because beta is an indicator of the relationship between an individual investment's return and the general market. The beta coefficient is an index of systematic risk of different assets. It can be viewed as an index of the degree of responsiveness or co-movement of asset return with market return. The beta coefficient for an asset can be found by examining the asset's historic return relative to the returns for the market. The market returns should be based upon a broad index of all risky assets because such an index is not conveniently available. They are typically measured by the average return on all assets. The beta for the market is equal to one; all other beta is viewed in relation to this value.

"A stock's contribution to the risk of a fully diversified portfolio depends on its sensitivity to change. This sensitivity is generally known as beta."[17]

"The tendency of a stock to move with the market is reflected in its beta coefficient, b. which is a measure of the sock's volatility relative to that of an average a stock. Beta is a key element of the CAPM."[18]

In the capital assets pricing model, beta is taken to be the appropriate measure of risk of an individual security or investment. Betas are obtained by relating individual security returns to the returns of the market portfolio. Capital asset pricing model (CAPM) uses beta to link formally the notions of risk and return. Wise investors don't run risks just for fun. They are playing with real money. Therefore, they require a higher return from the market portfolio and then from treasury bills. The difference between the return on the market and the interest rate

[17] Berealey and Myers, 2000. P. 145.
[18] Weston and Brigham, 1996, P. 132.

is return for the market risk premium. The CAPM model states that in well functioning capital markets the expected risk premium on each investment is proportional to its beta. Since, the market portfolio is efficient, there will be a simple linear relationship between the beta of any security and its expected rate of return. The beta coefficient in a linear regression can be defined in this manner.

$$\text{Beta coefficient } (B_i) = \frac{Cov(R_i, R_m)}{\pm^2_m}$$

Where,

B_i = Beta coefficient of i^{th} security

σ^2_m = Variance of market return

Cov (R_i,R_m) = Covariance between the returns of security i and market

Alternatively,

$$\text{Beta coefficient } (\beta_i) = \frac{N \quad XY \; Z \quad X \quad Y}{N \quad X^2 \; Z(\quad X)^2}$$

Where,

X = Market return

Y = Security return

N = Number of observations

= Summation

Market beta

Beta of a market return equals to 1.00 and beta coefficient as an index of systematic risk is used to rank the assets. If beta is larger than 1.00, then the asset is more risky or more volatile than the market and is called an aggressive beta. If the beta is less than 1.00, then the asset is less risky or less volatile than the market and is called a defensive beta. If beta is equal to 1.00, then the asset is equaled risky with the market.

$$\text{Market beta } (\beta_m) = \frac{COV_{mm}}{\pm^2_m}$$

$$= \frac{\circ_{mm} \pm_m \pm_m}{\pm^2_m}$$

$$= \frac{1 \mid \pm^2_m}{\pm^2_m}$$

$$= 1$$

Portfolio beta

Portfolio beta is the weighted average beta of the total securities included in the portfolio. It can be calculated by using the following equation:

$$\text{Portfolio beta } (\beta_p) = \sum_{i\text{X}1}^{n} W_i B_i$$

$$= W_1\beta_1 + W_2\beta_2 + \ldots\ldots\ldots\ldots + W_n\beta_n$$

Where,

W_i = Weight or proportion of fund invested in i^{th} security

β_i = Beta of i^{th} security

n = Number of securities included in the portfolio

W_1 and W_2 = Proportion or weight of fund invested in security 1 and security 2

β_1 and β_2 = Beta of security 1 and security 2

W_n = Weight or proportion of investment in n^{th} security

β_n = Beta of n^{th} security

[B] Unsystematic Risk

Unsystematic risk is also known as non-factor risk or non-market risk or unique risk or diversifiable risk or avoidable risk or residual risk or company-specific risk or irrelevant risk. It is related to micro economic factors. The risk, which can be diversified away by forming the portfolio, is called unsystematic risk. Unsystematic risk is caused due to the lack of management, labor strikes,

inventions, advertising campaigns, availability of raw materials, shifts in consumer taste, lawsuits etc.

More precisely, the unsystematic risk is unique to each firm; an efficiently diversified portfolio of securities can successfully eliminate most of the unsystematic risk inherent in individual securities. Unsystematic risk is calculated as follows:

$$\text{Unsystematic risk} = \sigma_i - b_i$$

Where,

σ_i = Total risk of security i or standard deviation of security i

b_i = Systematic risk of security i or beta coefficient of security i

[C] The Characteristic Line

Measuring its variability of returns can assess the total risk of any asset. The total risk can be partitioned into two main parts: systematic risk and unsystematic risk. Both can be estimated by using the characteristic regression line. The equation for the characteristic line (or regression line) is

$$r_{it} = a_i + b_i r_{mt} + e_{it}$$

Where,

r_{it} = total return on i^{th} asset at time t.

a_i = alpha or intercept of characteristic line or an estimate of the i^{th} asset's rate of return when the market return is zero.

b_i = beta coefficient or slope of characteristic line.

r_{mt} = market rate of return at time t.

e_{it} = the random error around the regression line for security i during time period t.

Above characteristic line describes the relationship between the returns on a stock and the returns on the market portfolio. Moreover, the characteristic regression line of an asset explains the assets' systematic variability of return in terms of

market forces that affect all assets simultaneously. The characteristic line is normally written (without the time subscripts) as

$r_i = a_i + b_i r_t$

The term a_i is called an alpha coefficient for security i. It measures the i^{th} asset's rate of return when the market return $r_m = 0$. The term b_i is called the beta coefficient; it measures the slope of the characteristic line. Beta is defined mathematically as

$$b_i = \frac{Cov(r_i, r_m)}{\pm \sigma_m^2} X \frac{\text{Units of rise}}{\text{Units of run}} X \text{Slope of regression line}$$

Where,

$Cov(r_i, r_m)$ = the covariance of return of the i^{th} asset with the market.

σ^2_m = the variance of the returns of the market index.

Alternatively, the characteristic line is known as a regression line and it is used to measure statistically the undiversified risk and diversifiable risk of individual assets and portfolio. It is similar to a regression line. So, market return in the equation $r_{it} = a_i + b_i r_{mt}$ is the independent variable and asset return is the dependent variable.

The characteristic line is sometimes called a single factor model because it contains of only one source of systematic risk, r_{mt}. The characteristic line can be decomposed into a multifactor model that includes interest rate risk, default risk, and other risk factors.

$r_{i,t} = a_i + b_i r_{m,t} + e_{i,t}$

$r_{i,t} = a_i + b_{i1} F_{1,t} + b_{i2} F_{2,t} + \ldots\ldots\ldots\ldots\ldots\ldots + b_{ik} F_{k,t} + e_{i,t}$

This equation is called a k-factor return generating function. The equation contains of K different risk factors to explain the i^{th} asset's return. The random variables denoted $F_{k,t}$ represented K different risk factors, $F_{k,t}$ for K = 1,2 ....., K, that were observed over T different periods, t = 1,2, ..., T. The K regression coefficients, b_{ik}, measure the sensitivity of the i^{th} asset's return to the K^{th}

risk factor. b_{i1} might be the beta for the interest rate risk factor, and b_{i2} might be the default risk beta.

2.2.29 Partitioning Total Risk

Partitioning risk is the division of the total risk (variance) into systematic and unsystematic components.

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

OR,

$$\text{Var}(r_i) = b^2_i \, \text{var}(r_m) + \text{Var}(e)$$

OR,

$$\sigma^2_i = b^2_i \, \sigma^2_m + \sigma^2_e$$

Where,

σ^2_i = Total risk (variance) of i^{th} asset

b_i = Beta coefficient of i^{th} asset

σ^2_m = Variance of the returns of the market

σ^2_e = Variance of standard error

[A] Proportion of Systematic Risk

The proportion or percentage of systematic risk in total risk is also called the coefficient of determination or squared correlation coefficient (i.e. ρ^2). It is calculated as follows:

$$\text{Proportion of systematic risk } (\rho^2) = \frac{\text{Systematic risk}}{\text{Total risk}}$$

OR,

$$= \frac{b_i^2 \, \text{var}(r_m)}{\text{var}(r_i)} \text{ X} \frac{b_i^2 \pm {}^2_m}{\pm {}^2_i}$$

[B] Proportion of Unsystematic Risk

The proportion or percentage of unsystematic risk in total risk is calculated as follows:

Proportion of unsystematic risk = $1.00 - \rho^2$

OR,

$$= \frac{\text{Total risk} - \text{systematic risk}}{\text{Total risk}}$$

OR,

$$= \frac{Var(r_e)}{Var(r_i)} X \frac{\pm_e^2}{\pm_i^2}$$

2.2.30 Relationship between Systematic Risk and the Coefficient of Determination

The Coefficient of determination and the proportion of systematic risk are the same. The coefficient of determination is the proportion of systematic risk in total risk. The higher the systematic risk the higher will be the coefficient of determination and vice versa. The following equation justifies that the coefficient of determination and the proportion of systematic risk are the same.

$$\text{Coefficient of determination } (\rho^2_{im}) = \frac{\text{Systematic risk}}{\text{Total risk}}$$

$$= \frac{b_i^2 \pm_m^2}{\pm_i^2}$$

$$= \frac{(\frac{\circ_{im} \pm_i \pm_m}{\pm_m^2})^2 \mid \pm_m^2}{\pm_i^2}$$

$$= \frac{\frac{\circ^2_{im} \pm^2_i \pm^2_m}{\pm^4_m} \mid \pm^2_m}{\pm^2_i} X \circ^2_{im}$$

Proportion of systematic risk $= \rho^2_{im}$

Proportion of unsystematic risk $= 1 - \rho^2_{im}$

2.2.31 Concept of Capital Assets Pricing Model (CAPM)

` The basic theory with respect to risk and return is commonly called the capital asset pricing model (CAPM). It was developed to explain the behavior of security prices and provide a mechanism whereby investors could assess the impact of a proposed security investment on their overall portfolio risk and return. Harry M. Markowitz laid down the foundation of modern portfolio theory in 1952. William Sharpe, John Lintner and Jan Mossin developed the CAPM 12 years later. Capital assets are the long term financial as well as real assets and CAPM is based on the pricing of these assets. Modern portfolio theory of Markowitz suggests that the investment decision should be based on the total risk and the price of asset should also be determined on the basis of total risk. But the CAPM suggests that, any investor can create a portfolio of assets that will eliminate virtually all-diversifiable risk, the only relevant risk is no-diversifiable risk, and therefore, the investment decision and the pricing of capital assets should be based on the undiversified risk. This is the primary importance of selecting assets with the most desired risk return characteristics. The CAPM further suggests that the price of capital assets should be determined in a way that compensates the systematic risk.

The CAPM offers a hope for accomplishing a systematic calculation of risk adjusted present value. The measure reflects the investor's alternative investment return-risk trade-off opportunities when there is no default risk.

The CAPM provides both a theoretical understanding and a practical measure of the cross section of one period expected return rate on currently market portfolios of risky assets during a particular period of time.

The CAPM is a "one-factor" pricing model in the sense that it postulates only one factor namely the expected return rate on the market portfolio M that suffices to explain the cross section of portfolio return rates.

CAPM suggests that in equilibrium market, every security available in the market is period and they provide risk adjusted rate of return.

Various financial experts have viewed CAPM in different ways. Some of them are as follows.

"Capital assets pricing model (CAPM) describes the way expected returns on different securities will relate to their risk if everyone in the economy used portfolio theory to determine his/her investment positions."[19]

"The conceptual basis for examining the relationship between risk and return is developed in a framework called the capital asset pricing model. The model offers a theory and methodology for evaluating any investment decision where capital is committed for the purpose of earning future profits."[20]

The CAPM is a major contribution to modern business finance theory and practice. It is the extension of the model portfolio theory. This theory ignores that the portfolio theory ignores the risk free security in the market. Its risk (standard deviation) is equal to zero. For example, governmental bond and debenture are risk free. If risk free security is included in risky security then it becomes capital asset pricing model. Thus, CAPM describes how the risk returns trade off all the markets.

The relationship between an asset's return and its systematic risk can be expressed by the CAPM, which is also called the security market line (SML). The equation for the CAPM or the SML is

[19] R.A. Haugen, *Modern Investment Theory*, Prentice Hall International Inc., 1997, P. 119.
[20] J.J. Hampton, *Financial Decision Making: Concepts, Problems and Cases*, Prentice Hall of India, New York, 1983, P. 339.

$$E(R_i) = RF + [E(R_m) - RF]\ \beta_i$$

Here $E(R_i)$ is the expected return for an asset, RF is the risk-free rate (usually assumed to be a short-term T-bill rate), $E(R_M)$ equals the expected market return, and β_i denotes the asset's beta.

The CAPM is an equilibrium model for measuring the risk-return trade off for all assets including both inefficient and efficient portfolios. A graph of the CAPM is given in the figure number 15.

The CAPM or Security Market Line (SML)

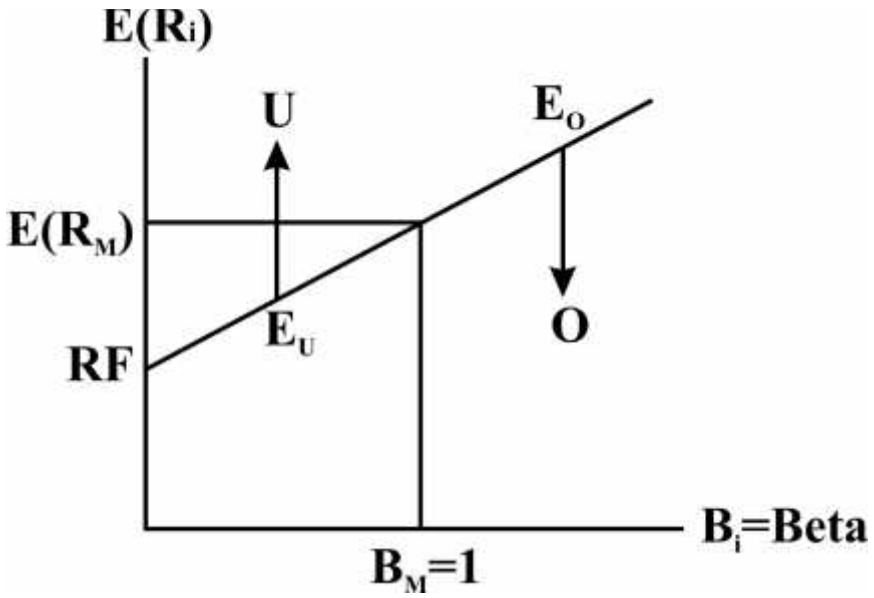


Figure No.15

Figure depicts two assets, U and O that are not in equilibrium on the CAPM. Asset U is undervalued and, therefore, a very desirable asset to own. U's price will rise in the market as more investors purchase it. However, as U's price goes up, its returns fall. When U's return falls to the return consistent with its beta on the SML, equilibrium is attained. With O, just the opposite takes place. Investors will attempt to sell O, since it is overvalued, and, therefore, put downward pressure on O's price. When the return on asset O increases to the rate that is consistent with the beta risk

level given by the SML, equilibrium will be achieved and downward price pressure will cease.

2.2.32 Use the Capital Assets Pricing Model (CAPM)

Bierman and Smidt, 1986 P. 115 has identified the following uses of CAPM:

I. To estimate the cost of equity capital using $E(R_i) = RF + [E(R_M) - RF]\beta_i$:

These estimates are used both for public utility regulatory proceedings and determining the required return to be earned by operating division of corporations.

II. To evaluate securities

If the expected return is larger than $R_i = RF + (R_M - RF)\beta_i$ the security is a "bargain". If a security has a larger expected return than the return indicated by the CAPM, all investors (with homogeneous expectation) will buy it until its expected return is lowered to be equal to $E(R_i) = RF + [E(R_M) - RF]\beta_i$. In like manner if a security is expected to earn less than $RF + [E(R_M) - RF]\beta_i$ no one will buy (some will sell it short), its price will decrease, and its expected return will increase. All securities are contained in the market portfolio in proportion to their market value. The beta of market portfolio is one.

III. To form portfolios of securities, the weighted average of the betas of all the securities is one relevant risk measure if the investor is imperfectly diversified.

2.2.33 Limitations of Capital Assets Pricing Model (CAPM)

- It is hard to estimate the risk free rate of return on projects under different economic environment.

- The model does not appear to adequately explain the variation in stock returns. Empirical studies done in the past 15 years stocks may offer higher returns.
- What is market portfolio? Does it include the bond market? Real estate? Commodities? Private placements?
- The market portfolio and hence its return are not observable and have to be estimated. Therefore the model is not testable.
- The model assumes that all investors are risk averse. Some investors are not risk averse.
- The model assumes that all investors create mean-variance optimized portfolio.
- Complications in decision-making can not be modeled easily.

2.3 Review of Related Studies

The objective of this section is to know how the relation between risk and return is defined, described and measured by different studies. In this section of review, some studies are reviewed with the topic. It also helps us to understand more about risk and return.

There are some previous studies based upon the theoretical concept about the nature of relationship between the risk and return. Stigler hypothesized the differences in according rates of return that could be explained by differences in business risk. The commitment was based upon the study of entrepreneur who would require higher rate of return in industries, which has higher risk and vice versa. Stigler committed the task in 1963 after seventeen years, in 1980; Bowman had tested the correctness of the Stigler hypothesis. Risk, in terms of variance and return, in terms of mean return of 387 companies were tested based upon the return

on equity. The companies were selected from 11 industries and the time period for 1972 to 1976. The coefficient of correlation was found to be negative in 10 industries out of 11 industries.

Mr. Umakanta Dulal (2001) had studied the position of risk and return of Nepalese companies. The profitability ratios served as a basis for the measurement of risk and return. Risk was expressed in terms of standard deviation and coefficient of variation to the profitability ratios. The study justified opposition to the proverb “Higher the risk, higher the return and vice versa.”

Mr. Ashok Kumar Rai (2003) had performed the study on the position of risk and return of investment of Nepalese financial institutions. Banking sector, finance sector and insurance sector were taken under the study. The risk was measured in terms of C.V. and return was measured in terms of mean return. The study was based upon six profitability ratios. The study concludes of being inverse to the proposition “Higher the risk, higher the return and vice versa.”

Mr. Raju Kumar Rai (2005) had studied the position of risk and return of ‘A’ Graded financial institutions of Nepal. Eight samples were taken under the study. The risk was measured in terms of C.V. and return was measured in terms of mean return. The study is based upon eight profitability ratios. The study is concluded that the “Higher the risk, higher the return and lower the risk, lower the return” is not appropriate in this case.

CHAPTER - III

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is a step-by-step attempt to solve the research problems. It shows the way to solve the research problem systematically. To acquire the research objective, a good research methodology has to be followed. A research methodology helps us to find out accuracy, validity and suitability of our study. The justification in the present study cannot be obtained without the help of proper methodology. Research methodology basically describes the method, process, tools and techniques applied in the entire process of the study. "Research methodology is a way to systematically solve the research problem." [21] The basic objective of the study is to gain an insight into the risk and return of position of the selected banking and finance companies, which requires various steps to be followed before ascertaining the objective. Research methodology shows to the various sequential steps to be adopted by a researcher in studying a problem with certain objective of the study on risk and return analysis of different companies.

Research can be conducted on the basis of primary and secondary data. Here in the study all the data are secondary which are obtained from both NEPSE website www.nepalstock.com and previous thesis and the obtained data are analyzed by using appropriate financial and statistical tools.

Research Design

Research design is a plan, structure and strategy of investigation conceived so as to obtain answers to research questions and to control variance. The plan is the overall scheme or program of the research. It includes an outline of what

[21] C.R. Kothari, *Research Methodology, Method and Techniques*, 2nd Edition, Wishwa Prakashan, New Delhi India, 2000, P.10.

the investigator will do from witting hypothesis and operational implications to the final analysis of data. Research design occupies a key position in the research work. It facilitates the smooth sailing of the various research operations. A well-designed research helps the researcher to narrow down the area of investigation from the broad canvas without missing the needed information.

There are many definitions of research design, but no single definition imparts the full range of important aspects:

"The research design also enables the researcher to anticipate potential problems of data gathering operationalization of concepts, measurement."[22]

"A research design is the program that guides the investigator in the process of collecting, analyzing and interpreting observations."[23]

Basically, the research has two purposes, the first purpose is to answer the research question or test the research hypothesis and the second purpose of a research design is to control variance.

There are three types of variance, which can be controlled.

»Maximization of experimental variance

»Control of extraneous variance

»Minimize the error variance

For example, an army prepares a strategy before launching an attack. An architect prepares a blueprint before he/she approves a construction. In the same way, a researcher makes a plan of his/her study before he/she undertakes his/her research work. This will enable the research to save time and resources.

This research study is based on recent historic data. It covers the five years period from FY 2004/05 to FY 2008/09. It deals the status of risk and return of the selected companies. In the study, data of four blanks for FY 2004/05 are

[22] J.A. Black & D.J. Champion, *Methods and Issues in Social Research*, Wiley and Sons, New York, 1976, P. 77.
[23] D. Nachmias & C. Nachmias, *Research Method in the Social Science*, St. Martin's Press, New York, 1987, P. 21.

obtained from previous thesis and data of four banks for FY 2005/2006 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com. Similarly data of only one bank and two finance companies for FY 2004/05 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com. The pattern of return and its volatility risks are analyzed in the study. The trend of return of each company is also studied. More than that, the relationship between the mean return, standard deviation and the coefficient of variation is examined to find whether the relationship between these variables in the study is positive or negative. The test of correlation is also done in this study. Therefore, the research design used in the study is basically descriptive cum analytical in nature.

3.3 Population and Sample

Population is the combination of each unit. It is also known as universe of the study. The word 'universe' as used in statistics denotes the aggregate from which the sample is to be taken. Population may be finite or infinite. In a finite population, number of the item can be determined and in an infinite population, number of the item can not be determined. In many cases, the study of whole population is neither feasible nor desirable. In this study, samples are taken for the study. Sample is the representative of the population. It is a part of universe that the researcher selects for the purpose of investigation. The sample demonstrates the characteristics of the population. Sample is a subject of population units and the process of choosing a sample from the population to learn about the population on the basis of sample is known as sampling.

For analysis of risk and return of banking and finance companies at logical inferences, five commercial banks and two finance companies are taken under consideration. They are as follows:

Names of the sample banks

»Bank of Kathmandu Limited

»Himalayan Bank Limited

»Nepal Bangladesh Bank Limited

»Nepal Investment Bank Limited

»Nepal Industrial & Commercial Bank Limited

Names of the sample finance companies

»Narayani Finance Limited

»Premier Finance Limited

3.4 Nature and Sources of Data

In dealing with any problem, data is necessary to collect adequate and appropriate data. The data is main material on which analysis is done evaluated and the results are declared. In research, one of the most difficult problems is to collect data. Depending upon the sources mainly there are two types of sources of data. They are Primary source of data and secondary source of data.

The data collected for the firs time by the researcher as original data are known as primary data, which refers for the purpose of certain study or information. The primary data are usually in a raw and bulky form and the data obtained in a census study are also called primary data. Generally collecting primary data needs large amount of expenses and long time period but data so collected in highly reliable if appropriate precaution is taken and can be collected through interviews, observations by or under the direct supervision of the researcher so that errors could be avoided. For example, if a researcher is interested to know about what the women think about the issue of abortion, he/she must undertake a survey and collect data on the opinions of women by asking relevant questions. Such collected data would be considered as primary data. Collections of primary data are of different kinds. Some

of them are direct personal investigation, indirect personal interviews, mailed questionnaire method, information from correspondents and schedule sent through enumerator.

Secondary data refer to information gathered from sources already existing. Secondary resources include memories, letters, diaries, newspapers, periodicals, yearbook, census reports, survey reports and government journals. Secondary data is information that is collected for the purpose other than to solve the specific problem under investigation. Secondary data generally may not require large amount of expenses and long time. Its reliability should be checked and the data can also be purchased in many cases from commercial research agencies. For example, if a researcher desires to analyze the weather conditions of different regions of Nepal, he/she can get the required information from the records of the meteorology department, Kathmandu that is the secondary data.

This study is mainly based on secondary data. Five years′ data (i.e. FY 2004/2005 to FY 2008/2009) are applied for the study. All data of commercial banks and finance companies are obtained from previous thesis and NEPSE website www.nepalstock.com.

3.4.1 Data Collection Process

For the research purpose, data is main material to be studied. The data of four banks for FY 2004/2005 are taken from previous thesis consulting in the library and the data of these four banks for FY 2005/2006 to FY 2008/2009 are obtained through computer print out from NEPSE website www.nepalstock.com. Likewise the data of Nepal Bangladesh Bank Limited and two finance companies for FY 2004/2005 to FY 2008/2009 are also obtained through computer print out from NEPSE website www.nepalstock.com.

3.4.2 Data processing procedure

After collecting the data, researcher should process the data in order to make it easy for the presentation and analysis of the study. In this context, the data have been processed and recited in condensed form. Thereafter, they have been tabulated and presented using financial and statistical tools. The ratios used for the study have been calculated by using the financial tools. After that the calculation of risk and return are also carried out. The trend equation and the trend value are also calculated. After this, the relationship between the risk and return are also worked out. Finally, the student's t-test for banks is used to test the relevancy of correlation and the analysis of variance.

Techniques of Analysis

For this study, inferential and descriptive techniques are applied as techniques of analysis. Descriptive analysis is based on the different ratios that are arranged in the tabular form. The standard deviation and coefficient of variation have been used to analyze the variability of these ratios. The trend of return and trend equation with their predicted values are also calculated. Apart from this, Karl Pearson's coefficient of correlation is also calculated to describe the nature of relationship between risk and return.

For the inferential analysis, null and alternative hypothesis of banks are only formulated and tested in student's t-test. If the calculated value of /t/ is less than equal to the tabulated value or critical value of /t/ at 5% level of significance with (n-2) degree of freedom, the null hypothesis is accepted and alternative hypothesis is rejected.

3.6 Analytical Tools

For the data analysis, some suitable tools are to be used in order to secure the precise findings of the study. There are two types of analytical tools applied in this study. They are:

I. Financial Tools

II. Statistical Tools

I. Financial Tools

Financial tools are designed to determine the relative strengths and weakness of business operations. Financial tools are utilized to find out the rate of return. From this return, the risk (standard deviation and C.V.) are determined. The risk and return are calculated from the various profitability ratios as under:

(a) Return on Assets or Profit to Asset Ratio

This ratio measures the return of profit of total invested financial resources. So to earn the profit return on total invested financial resources is necessary. Return on asset ratio measures the net profit after tax against the amount invested in total assets to ascertain whether assets are being utilized properly or not. After the assets invest in various projects, profit is determined by dividing net profit after tax and interest by total assets and the result is multiplied by hundred. It is mathematically written below.

$$\text{Return on Assets} = \frac{\text{Net Profit After Taxes and Interest}}{\text{Total Assets}} \times 100$$

(b) Return on Shareholder's Equity

This ratio clarifies the relationship between net profit and capital. This ratio gives the information about the return associated with shareholders. The term shareholders equity includes preference share capital, ordinary or common share capital, share premium, reserves and surplus less accumulated losses. It is a good

for organization if the return of the investment is high. Return on shareholder's equity is calculated by dividing the net profit after taxes and interest by shareholder's equity and the result is multiplied by hundred. It is mathematically written below.

$$\text{Return on Shareholder's Equity} = \frac{\text{Net Profit After Taxes \& Interest}}{\text{Shareholder's Equity}} \times 100$$

(c) Dividend Payout Ratio

The Dividend is the portion of the profit distributed as the return to the shareholders. Dividend is distributed to the shareholders if the firm earns the profit but the payment of dividend to shareholders is not compulsory when the firm earns the loss. For regular dividend, the firm should have sufficient earnings. Management may also declare extra dividends when earnings are high and funds are available. So the main purpose of dividend payout ratio is to find out that how much dividend per share should be distributed from the earning per share. Dividend payout ratio is ascertained by dividing dividend per share by earning per share and the result is multiplied by hundred. It is mathematically written below.

$$\text{Dividend Payout Ratio} = \frac{\text{Dividend Per Share}}{\text{Earning Per Share}} \times 100$$

(d) Dividend Yield

Dividend refers the distributed portion of income. Market price of a share means the transaction value of a share in the general market. A ratio between dividend per share and market value per share is known as dividend yield ratio. It evaluates the shareholders return in relation to the market value of share. It can be computed by the following formula.

$$\text{Dividend Yield} = \frac{\text{Dividend Per Share}}{\text{Market Value Per Share}} \times 100$$

(e) Earning Yield

This ratio shows the relationship between the earning price per share and market price per share. Earning yield is calculated by dividing earning price per share by market price per share and the result is multiplied by hundred. It is mathematically written below.

$$\text{Earning Yield} = \frac{\text{Earning Price Per Share}}{\text{Market Price Per Share}} \times 100$$

(f) Price Earning Ratio

This ratio shows the relationship between market price per share and earning per share. When the market price per share is divided by earning per share, the quotient is known as price earning ratio. This ratio reveals of how many times the market price is greater than earning price of a share. Mathematically,

$$\text{Price Earning Ratio} = \frac{\text{Market Price Per Share}}{\text{Earning Per Share}}$$

(g) Earning Power Ratio

This ratio reveals the relationship between earning before interest and taxes and total assets. This ratio measure of how much the return on the investment of total assets can be gained. It also determines that whether the assts of the firm are being utilized properly or not. It is computed by the following formula.

$$\text{Earning Power Ratio} = \frac{\text{Earning Before Interest and Taxes}}{\text{Total Assets}} \times 100$$

OR,

$$\text{Earning Power Ratio} = \frac{\text{Net Profit Before Interest and Taxes}}{\text{Total Assets}} \times 100$$

OR,

$$\text{Earning Power Ratio} = \frac{\textit{Net Profit Before Interest and Taxes}}{\text{Total Assets}} \times 100$$

II. Statistical Tools

Statistical Tools are arithmetic mean, standard deviation, Coefficient of variation, Karl Pearson's Coefficient of correlation and student's t-test. The tools are discussed as under:

(a) Arithmetic Mean

The most popular and widely used measure of central tendency is the arithmetic mean. It is also called simply 'the mean'. The sum of all the observations divided by the number of observations is called arithmetic mean. In such cases, all the items are equally important. Mean is used in this study to find out the average of the different probability ratios applied. The arithmetic mean is symbolically represented as below:

$$\bar{X} = \frac{X_1 + X_2 + X_3 + \ldots\ldots\ldots\ldots + X_n}{N}$$

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

Where,

$\bar{X}$ = Arithmetic Mean

$X_1+X_2+X_3+ \ldots\ldots\ldots\ldots + X_n$ = Values of Variables

X = Sum of the values of variables X

N = Number of observations

(b) Standard Deviation

Standard deviation is the best measure of dispersion. It is an improvement over the mean deviation and is free from the defects of other measures of dispersion. The standard deviation is defined as the positive square root of the arithmetic mean of the squared deviations from their arithmetic mean of asset of values. It is also

known as ‘Root Mean-Square Deviation’. It is usually denoted by the Greek letter ‘σ’ (Sigma). Symbolically,

$$\sigma = \sqrt{\frac{(X - \bar{X})^2}{N - 1}}$$

Where,

$(X - \bar{X})^2$ = Sum of the square of mean deviation

σ = Standard deviation

N = Number of observations

(c) Coefficient of Variation

The relative measure of dispersion based on standard deviation is called coefficient of standard deviation. As it is not appropriate through standard deviation, the comparison of the variability of two or more distributions is made easy by coefficient of variation. It reflects the risk per unit and provides a quick summary of the relative trade-off between risk and return. It is computed by dividing the standard deviation by arithmetic mean. Mathematically,

$$CV = \frac{\pm \sigma}{\bar{X}}$$

Where,

CV = Coefficient of Variation

σ = Standard deviation

$\bar{X}$ = Arithmetic mean

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

(d) Trend Analysis

Observing past behavior of return over a period of time the analysis of risk and return can be done. Trend analysis depicts the trends in the operation of the company. The trend analysis indicates the direction of change that helps in studying the company status and change thereof overtime and determine whether there has been an improvement or deterioration in the financial conditions and performance overtime. It is important to analyze trend in rations as well as their absolute levels, for trends give dues as to whether the financial situation is improving or deteriorating. There are different methods that can be used for determining trend such as trend percentage method, method of least square, graphical method and the like. However the method used in this study is the method of least square and to make the study simple and easy to understand the graphical method is also applied.

(d.1) Method of Least Square

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

(i) $(Y - Y_n) = 0$ and (ii) $(Y - Y_n)^2$ are least where Y is the actual dependent variable value, Y_n is the computed value for different n period and n is the number of periods for which the data are given. As $(Y - Y_n)^2$ is least, hence the name method of least square. The line obtained by this method is known as the line of best fit. The method of least square may be used either to fit a straight line trend or a parabolic trend. The straight line trend is presented by the equation:

$$Y_n = a + b.x$$

Where Y_n is used to designate the trend values to distinguish them from the Y's value, a is the Y intercept, b is the slope of the trend line and x is the independent variable that represents time taking mid-point as origin.

Symbolically, $a \text{ X} \frac{\psi}{\rho}$

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

Where,

Y = Sum of the values of the dependent variable Y

N = Number of observations

XY = Sum of the product of the values of variables X and Y

X^2 = Sum of the squared value of variable X

The constant 'a' is equal to mean of Y's value and the constant 'b' gives the rate of change.

(d.2) Graphical Method

Graphical method is used in the study that shows the calculated or predicted value for five years derived from the trend equation. The graphical method used in the study is presented with a view of supporting the tabulated value of trend equation and trend values of the selected banking and finance institutions.

On the X-axis of the graph, fiscal years are presented and on Y- axis, the banks and finance companies with their predicted values are shown.

(e) Karl Pearson's Coefficient of Correlation

Correlation analysis is defined as the statistical technique which measures the degree and direction of relationship (or association) between / among the variables. In the other words, it helps in studying the covariance of two or more variables. Correlation analysis does not tell anything about cause and effect relationship i.e. if there is a high degree of correlation between the variables, we can not say which is the cause and which is the effect.

There are various methods of ascertaining whether two variables are correlated or not such as Scatter diagram, graphic method, concurrent deviation method and Karl Pearson's coefficient of correlation. Among these methods, Karl Pearson's coefficient of correlation is widely used in practice.

This study uses the Karl Pearson's coefficient of correlation to achieve its objective by measuring and testing correlation between risk and return. The Karl Pearson's coefficient of correlation is mathematically expressed as:

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

Where,

r = Karl Pearson's coefficient of correlation

N = Number of observations

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

$\sum Y$ = Sum of the values of Variable Y

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

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

$\sum Y^2$ = Sum of the squared values of variable Y

$(\sum X)^2$ = Squared the sum of the values of variable X

$(\sum Y)^2$ = Squared the sum of the values of variable Y

The value of the coefficient of correlation as obtained by the above formula must always lie between $\pm$ 1.00

(f) Student's t-test

Karl Person's coefficient of correlation between the variables is analyzed. Henceforth, after the calculation of correlation coefficient, an attempt has made to prove whether there is significant statistical relationship between the risk and return

as shown by the correlation coefficient. For this purpose, the present study has applied student's t-test for testing the significance of the coefficient of correlation of banking sectors only.

The student's t-test is used to test hypothesis that the correlation coefficient of the population is zero i.e. the population of the variable in the question is uncorrelated.

The value of 't' can be calculated using the following formula:

$$t = \frac{r.\sqrt{(n-2)}}{\sqrt{(1-r^2)}}$$

Where,

t = Student's calculated t-value

r = Coefficient of correlation

n = Number of observations

The tabulated value is based on (n-2) degree of freedom at 5% level of significance or alternative at 95% level of confidence. If the calculated value of /t/ is greater than the critical value or tabulated value of /t/ at 0.05 for (n-2) degree of freedom, the null hypothesis is rejected which indicates that the value of 'r' is significant i.e. there is statistical significant relationship between the variable under consideration at 95% level of significance. If the calculated value of /t/ is less than equal to the critical value or tabulated value of /t/ at o.o5 for (n-2) degree of freedom, the alternative hypothesis is rejected.

3.7 Limitations of the Methodology

Though the researcher always attempts to get into the depth of the fact, there are always some boundaries in the practical life that are considered as limitations of the study. The limitations of this methodology can be categorized under the following heads:

1. This study is only based on the financial statements of the banks and finance companies for the period of five years i.e. from fiscal year 2004/2005 to fiscal year 2008/2009.
2. The profitability ratio analysis, which too is used as a tool for determining risk and return, has its own limitations, which are as follows:

- It is difficult to decide on an appropriate basis of comparison.
- The change in price level also makes the interpretation of the ratios paralyzed.
- The ratios do not give any indications of the future as it is calculated from past financial statements.

3. The arithmetic mean is a statistical tool of data analysis depends upon each and every item of the series; extreme items may be very small and very large items. This unduly distorts the precise value of the mean and as such the analysis.
4. The trend analysis is a statistical tool of data analysis ignores the impact of cyclical and irregular variation, as predications are based only on long-term variations. Hence, the trend analysis is flexible.
5. The Karl Pearson's coefficient of correlation is a statistical tool of data analysis that always assumes linear relationship between the variables regardless of the fact whether that assumption is correct or incorrect. Hence, extreme values unduly affect the value of the coefficient of correlation.
6. The test of statistical significance (mean and coefficient of variation are taken to analyze the student's t-test for banks only) indicates that a difference has statistical significance, though they not however tell us why the difference exists. Nonetheless, they suggest the need for further investigation in order to reach definite conclusions.

CHAPTER -IV

PRESENTATION AND ANALYSIS OF DATA

4.1 Introduction

This chapter presents all the data collected from various sources in a tabular and graphical form to analyze and interpret them systematically. Before presenting them tabular and graphical shape, the data are organized, diagnosed, selected, formulated and calculated. After presenting the data in a tabular and graphical form, they are analyzed and interpreted. Five years data are applied for the study (fiscal year 2004/2005 to 2008/2009) in order to assess the position of risk and return of the banking and finance companies. For this purpose, two types of analysis have been carried out descriptive and inferential.

Descriptive analysis is carried out to determine the risk and return position of the selected financial institution using differential profitability ratios. The mean, standard deviation and coefficient of variation are applied to asses the risk and return.

The inferential analysis is applied to make inter-bank and inter-finance company on risk and return position based on analysis of variance (ANOVA), Karl Pearson's correlation coefficient. Mean and coefficient of variation are taken to analyze the student's t-test for banking sectors only.

4.2 Presentation, Interpretation and Analysis of Data according to Descriptive Analysis based on Profitability Ratio

This part of descriptive analysis presents risk and return analysis of the sample of banks and finance companies chosen for the study.

4.2.1 Inter-firm Comparison of Risk and Return on the basis of Return on Assets of Commercial Banks

Table No. 9

Commercial Banks / Year	BOKL	HBL	NBBL	NIBL	NICBL
2004/2005	1.34	1.06	0.02	1.15	1.15
2005/2006	1.41	1.12	-5.65	1.45	1.51
2006/2007	1.65	1.55	-10.15	1.64	0.93
2007/2008	1.80	1.47	-14.63	1.82	1.36
2008/2009	2.01	1.74	5.22	1.77	1.63
$\bar{X}$	1.64	1.39	-5.04	1.57	1.32
σ	0.29	0.28	7.89	0.24	0.26
CV	17.68	20.14	-156.55	15.29	19.70

Source: The data of every bank except NBBL for FY 2004/2005 is taken from previous thesis consulting in the library and the data of every bank except NBBL for FY 2005/2006 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com and the data of NBBL for FY 2004/2005 to FY 2008/2009 is obtained from NEPSE website www.nepalstock.com.

The table number 9 contains the position of risk and return based on the return on assets of 5 commercial banks. Mean return represents the return and CV represents the risk factor.

The above table number 9 shows that BOKL has the highest efficiency to earn the return is 1.64%, NIBL has the second highest return 1.57%, and NBBL has the negative return 5.04%. The risk factor is denoted by CV where the HBL has the highest risk having a CV of 20.14%; NBBL has the negative CV of 156.55%.

Hence, the banking sector higher risk has not higher return and lower risk has lower return. The result of HBL does not support the proverb of "Higher the risk, higher the return and vice versa." But the result of NBBL supports the proverb of "Lower the risk, lower the return."

4.2.2 Inter-firm Comparison of Risk and Return on the basis of Return on Assets of Finance Companies

Table No. 10

Finance Companies / Year	NFL	PFL
2004/2005	2.37	1.16
2005/2006	2.41	2.32
2006/2007	2.34	2.21
2007/2008	2.65	1.28
2008/2009	1.09	0.14
$\overline{X}$	2.17	1.42
Σ	0.63	0.89
CV	29.03	62.68

Source: The data of both finance companies for FY 2004/2005 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com.

The above table number 10 contains the status of risk and return based on the return on assets of two finance companies. Mean return represents the return and coefficient of variance (CV) represents the risk factor.

Observing above table number 10, NFL has highest return of 2.17 with lowest risk but PFL has lowest return of 1.42 with highest risk. No one finance company supports the proverb of "Higher the risk, higher the return and vice

Versa." In fact, the above analysis revels the uncommon saying "Lower the risk, higher the return."

4.2.3 Inter-firm Comparison of Risk and Return on the basis of Return on Shareholder's Equity of Commercial Banks

Table No. 11

Commercial Banks / Year	BOKL	HBL	NBBL	NIBL	NICBL
2004/2005	68.11	33.39	0.89	35.18	56.69
2005/2006	54.26	34.32	154.45	39.18	61.77
2006/2007	53.82	46.02	78.74	42.50	58.03
2007/2008	69.26	36.82	31.75	46.56	61.43
2008/2009	49.49	36.57	-17.46	44.35	66.40
$\bar{X}$	58.99	37.42	49.67	41.55	60.86
Σ	9.04	10.12	68.98	4.52	3.86
CV	15.32	27.04	138.88	10.88	6.34

Source: The data of every bank except NBBL for FY 2004/2005 is taken from previous thesis consulting in the library and the data of every bank except NBBL for FY 2005/2006 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com and the data of NBBL for FY 2004/2005 to FY 2008/2009 is obtained from NEPSE website www.nepalstock.com.

The above table number 11 shows that all the firms under commercial bank have shown relationship between their mean return on shareholder's equity and their coefficient of variation. As earlier, return is represented by mean return ($\bar{X}$) and the risk is represented by coefficient of variation (CV).

Among 5 commercial banks, NICBL has the highest rate of return with 60.86% and BOKL has second highest with 58.99%. The lowest earning bank is

HBL with 37.42%. On the other hand, NICBL has the lowest risk having a CV of 6.34 only and NBBL has the highest risk with 138.88.

The result of table number 11 does not support the proverb of "Higher the risk higher the return and vice Versa." In fact, the above analysis reveals the uncommon saying "Lower the risk, higher the return."

4.2.4 Inter-firm Comparison of Risk and Return on the basis of Return on Shareholder's Equity of Finance Companies

Table No. 12

Finance Companies / Year	NFL	PFL
2004/2005	70.58	55.59
2005/2006	61.54	98.98
2006/2007	57.03	57.47
2007/2008	75.36	39.71
2008/2009	25.23	11.08
$\bar{X}$	57.95	52.57
Σ	19.66	31.91
CV	33.93	60.70

Source: The data of both finance companies for FY 2004/2005 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com.

Above table number 12 contains the status of risk and return based on the return on shareholder's equity of two finance companies. As earlier, return is represented by mean return ($\bar{X}$) and risk is represented by coefficient of variance (CV).

Observing above table number 12, NFL has the highest return with lowest risk but PFL has the lowest return with highest risk.

From analysis of table number 12, we conclude that the result does not support the saying "Higher the risk, higher the return and vice Versa." Analysis of table number 4 supports the proposition "Lower the risk, higher the return."

4.2.5 Inter-firm Comparison of Risk and Return on the basis of Dividend Payout Ratio of Commercial Banks

Table No. 13

Commercial Banks / Year	BOKL	HBL	NBBL	NIBL	NICBL
2004/2005	36.36	0.00	0.00	29.01	0.00
2005/2006	49.83	24.17	0.00	31.65	43.96
2006/2007	41.22	50.64	0.00	33.70	3.29
2007/2008	45.98	24.73	0.00	7.99	6.25
2008/2009	0.00	0.00	0.00	0.00	0.00
$\overline{X}$	34.68	19.91	0.00	20.47	10.70
Σ	20.03	21.08	0.00	15.39	18.77
CV	57.77	105.88	0.00	75.18	175.42

Source: The data of every bank except NBBL for FY 2004/2005 is taken from previous thesis consulting in the library and the data of every bank except NBBL for FY 2005/2006 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com and the data of NBBL for FY 2004/2005 to FY 2008/2009 is obtained from NEPSE website www.nepalstock.com.

The table number 13 demonstrates the status of return and risk based on the dividend payout ratio of 5 commercial banks. Return is represented by mean return and the risk is represented by coefficient of variation.

The figure in the above table number 13 reveals that BOKL has highest return of 34.68% and NIBL has second highest return of 20.47%, NBBL has not the return. We can also find the risk position from the table. NICBL has the highest risk position with a CV of 175.42% and NBBL has not the return.

From analysis in table number 13, we conclude that the result does not support the saying "Higher the risk, higher the return and vice Versa."

4.2.6 Inter-firm Comparison of Risk and Return on the basis of Dividend Payout Ratio of Finance Companies

Table No. 14

Finance Companies / Year	NFL	PFL
2004/2005	0.59	0.00
2005/2006	0.54	17.42
2006/2007	0.00	19.59
2007/2008	0.00	18.43
2008/2009	0.00	0.00
$\bar{X}$	0.23	11.13
Σ	0.31	10.18
CV	134.78	91.46

Source: The data of both finance companies for FY 2004/2005 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com.

Table number 14 contains the status of risk and return of two finance companies on the basis of dividend payout ratio for five years. Mean return ($\bar{X}$) represents the return and coefficient of variation (CV) represents the risk factor.

The figures in the above table number 14 reveal that PFL has the highest return rate of 11.13% and NFL has the lowest return with 0.23%. On the risk side, NFL has highest risk (CV) with 134.78% and PFL has the lowest risk (CV) with 91.46%.

From micro analysis in table number 14, the result does not support the proverb of "where there is higher the risk, there is higher the return and vice Versa."

4.2.7 Inter-firm Comparison of Risk and Return on the basis of Dividend Yield of Commercial Banks

Table No. 15

Commercial Banks / Year	BOKL	HBL	NBBL	NIBL	NICBL
2004/2005	3.39	0.00	0.00	1.60	0.00
2005/2006	3.49	1.26	0.00	1.56	2.73
2006/2007	2.12	2.73	0.00	1.59	0.11
2007/2008	1.45	0.86	0.00	0.29	0.16
2008/2009	0.00	0.00	0.00	0.00	0.00
$\bar{X}$	2.09	0.97	0.00	1.01	0.60
Σ	1.45	1.13	0.00	0.79	1.19
CV	69.38	116.49	0.00	78.22	198.33

Source: The data of every bank except NBBL for FY 2004/2005 is taken from previous thesis consulting in the library and the data of every bank except NBBL for FY 2005/2006 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com and the data of NBBL for FY 2004/2005 to FY 2008/2009 is obtained from NEPSE website www.nepalstock.com.

The above table number 15 contains the position of risk and return of the five commercial banks for the period of five years on the basis of dividend yield. Return is represented by mean return and the risk is represented by coefficient of variation.

After the careful study of the table number 15, it once again interprets that BOKL has the highest rate of return with 2.09%. NBBL earns no any return. While concentrating towards the risk position, NICBL has the largest scale of risk with 198.33%. Further, the table number 15 demonstrates that NBBL has no risk.

From short analysis in table number 15, the result supports the uncommon proverb “Higher the risk, lower the return.”

4.2.8 Inter-firm Comparison of Risk and Return on the basis of Dividend Yield of Finance Companies

Table No. 16

Finance Companies / Year	NFL	PFL
2004/2005	0.09	0.00
2005/2006	0.07	4.88
2006/2007	0.00	5.00
2007/2008	0.00	1.28
2008/2009	0.00	0.00
$\bar{X}$	0.03	2.23
Σ	0.05	2.53
CV	166.67	113.45

Source: The data of both finance companies for FY 2004/2005 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com.

Table number 16 contains the status of risk and return on the basis of dividend yield of two finance companies. The mean return ($\bar{X}$) represents the return and coefficient of variation (CV) represents the risk factor.

Concerning above the table number 16, PFL has highest rate of return with 2.23% and it has the lowest risk with 113.45%. Similarly NFL has the lowest rate of return with 0.03% and it has the highest risk (CV) of 166.67%.

From micro analysis in table number 16, the result does not support the slogan of "where there is high risk, there is high gain and vice Versa."

4.2.9 Inter-firm Comparison of Risk and Return on the basis of Earning Yield of Commercial Banks

Table No. 17

Commercial Banks / Year	BOKL	HBL	NBBL	NIBL	NICBL
2004/2005	9.32	5.84	0.21	5.50	6.27
2005/2006	7.00	5.21	-39.29	4.94	6.22
2006/2007	5.14	5.39	-125.45	4.71	3.25
2007/2008	3.16	3.49	-26.81	3.62	2.53
2008/2009	2.62	3.26	12.89	2.37	2.05
$\bar{X}$	5.45	4.64	-35.69	4.23	4.06
σ	2.77	1.17	54.31	1.23	2.05
CV	50.83	25.22	-152.17	29.08	50.49

Source: The data of every bank except NBBL for FY 2004/2005 is taken from previous thesis consulting in the library and the data of every bank except NBBL for FY 2005/2006 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com and the data of NBBL for FY 2004/2005 to FY 2008/2009 is obtained from NEPSE website www.nepalstock.com.

Above table number 17 demonstrates the status of risk and return of five commercial banks based on earning yield for five years. Specially, the risk is represented by coefficient of variation (CV) and return is represented by mean return ($\bar{X}$).

Observing above table number 17, among five commercial banks BOKL has the highest rate of return with 5.45%. HBL has the second highest return but the NBBL has the negative return of 35.69%. On the risk side, BOKL has the largest scale of risk with 50.83% that has the highest CV of this whole study and NBBL has the lowest risk with a CV of -152.17%.

From short analysis in table number 17, the result supports the proverb of "Higher the risk, higher the return and vice Versa."

4.2.10 Inter-firm Comparison of Risk and Return on the basis of Earning Yield of Finance Companies

Table No. 18

Finance Companies / Year	NFL	PFL
2004/2005	15.45	14.44
2005/2006	12.71	27.68
2006/2007	13.83	25.53
2007/2008	13.30	6.93
2008/2009	1.98	0.00
$\bar{X}$	11.45	14.92
Σ	5.40	11.85
CV	47.16	79.42

Source: The data of both finance companies for FY 2004/2005 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com.

Table number 18 contains the position of risk and return on the basis of earning yield of two finance companies for five years. As earlier, mean return ($\bar{X}$) represents the return and coefficient of variation (CV) represents the risk factor.

Between two finance companies, PFL has the highest rate of return with 14.92% and NFL has the lowest rate of return with 11.45%. On the other side, PFL has the highest risk with 79.42% and NFL has the lowest risk of 47.16%.

From short analysis in table number 18, the result supports the proverb of "Higher the risk, higher the return and vice Versa."

4.2.11 Inter-firm Comparison of Risk and Return on the basis of Price Earning Ratio of Commercial Banks

Table No. 19

Commercial Banks / Year	BOKL	HBL	NBBL	NIBL	NICBL
2004/2005	10.73	17.13	478.38	18.18	15.96
2005/2006	14.29	19.20	-2.55	20.25	16.09
2006/2007	19.46	18.57	-0.80	21.23	30.81
2007/2008	31.61	28.68	-3.73	27.63	39.57
2008/2009	38.18	30.66	7.76	42.33	48.69
$\bar{X}$	22.85	22.85	95.81	25.90	30.22
σ	11.67	6.30	213.91	9.80	14.43
CV	51.07	27.57	223.26	37.84	47.75

Source: The data of every bank except NBBL for FY 2004/2005 is taken from previous thesis consulting in the library and the data of every bank except NBBL for FY 2005/2006 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com and the data of NBBL for FY 2004/2005 to FY 2008/2009 is obtained from NEPSE website www.nepalstock.com.

The above table number 19 exhibits the status of risk and return of the commercial banks based on price earning ratio for five years. Mean return ($\bar{X}$) represents the return and coefficient of variation (CV) represents the risk.

Observing above table number 19, it reveals that NBBL has the highest return of 95.81% and NICBL has second highest rate of return with 30.22%. The lowest earning bank in respective to the price earning ratio are BOKL and HBL having rate of return with 22.85%. On the other side, NBBL has the highest risk with a CV of 223.26% and HBL has the lowest risk with a CV of 27.57%.

From micro analysis in table number 19, the result of 4 banks do not support the slogan "Higher the risk, higher the return." Only NBBL supports the proverb of "Higher the risk, higher the return."

4.2.12 **Inter-firm Comparison of Risk and Return on the basis of Price Earning Ratio of Finance Companies**

Table No. 20

Finance Companies / Year	NFL	PFL
2004/2005	6.47	6.92
2005/2006	7.87	3.61
2006/2007	7.23	3.92
2007/2008	7.52	14.43
2008/2009	50.57	0.00
$\bar{X}$	15.93	5.78
Σ	19.37	5.42
CV	121.59	93.77

Source: The data of both finance companies for FY 2004/2005 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com.

Table number 20 contains the status of risk and return of two finance companies based on price earning ratio for five years. As earlier, mean return ($\bar{X}$) represents the return and coefficient of variation (CV) represents the risk.

Concerning above table number 20, between two finance companies NFL has the highest rate of return with 15.93% and PFL has the lowest rate of return with 5.78%. On the risk side, NFL has the highest risk of 121.59% and PFL has the lowest risk of 93.77%.

From micro analysis in table number 20, it is cleared that NFL bears higher risk, gets higher return and PFL bears of lower risk, and gets lower return. Therefore, the result supports the slogan of higher the risk, higher the return and vice Versa.

4.2.13 **Inter-firm Comparison of Risk and Return on the basis of Earning Power Ratio of Commercial Banks**

Table No. 21

Commercial Banks / Year	BOKL	HBL	NBBL	NIBL	NICBL
2004/2005	4.96	3.68	5.08	4.21	4.73
2005/2006	4.51	3.96	-0.77	4.28	5.20
2006/2007	4.96	4.48	-6.77	4.67	4.60
2007/2008	4.96	4.43	-6.14	5.11	5.59
2008/2009	5.16	4.73	8.90	5.10	5.72
$\bar{X}$	4.91	4.26	0.06	4.67	5.17
Σ	0.24	0.37	6.88	0.48	0.47
CV	4.89	8.69	11466.67	10.28	9.09

Source: The data of every bank except NBBL for FY 2004/2005 is taken from previous thesis consulting in the library and the data of every bank except NBBL for FY 2005/2006 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com and the data of NBBL for FY 2004/2005 to FY 2008/2009 is obtained from NEPSE website www.nepalstock.com.

The above table number 21 exhibits the status of risk and return of the five commercial banks based on earning power ratio for five years. Mean return ($\bar{X}$) represents the return and coefficient of variation (CV) represents the risk.

Observing above table number 21, it reveals that NICBL has the highest return of 5.17% and BOKL has second highest rate of return with 4.91%. The lowest earning bank is NBBL whose earning is 0.06. On the other side, NBBL has the highest risk with a CV of 11466.67% and BOKL has the lowest risk with a CV of 4.89%.

From micro analysis in the table number 21, it is cleared that NBBL bears higher risk, gets lower return. No one bank's result supports the slogan of higher the risk, higher the return and vice Versa.

4.2.14 **Inter-firm Comparison of Risk and Return on the basis of Earning Power Ratio of Finance Companies**

Table No. 22

Finance Companies / Year	NFL	PFL
2004/2005	10.53	8.52
2005/2006	9.88	9.90
2006/2007	9.09	8.78
2007/2008	9.12	8.69
2008/2009	4.30	2.32
$\bar{X}$	8.58	7.64
Σ	2.49	3.03
CV	29.02	39.66

Source: The data of both finance companies for FY 2004/2005 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com.

Table number 22 contains the status of risk and return of two finance companies based on earning power ratio for five years. As earlier, mean return ($\bar{X}$) represents the return and coefficient of variation (CV) represents the risk.

Concerning above table number 22, between two finance companies NFL has the highest rate of return with 8.58% and PFL has the lowest rate of return with 7.64%. On the risk side, PFL has the highest risk of 39.66% and NFL has the lowest risk with 29.02%.

From micro analysis in table number 22, it is cleared that NFL bears lower risk, gets higher return and PFL bears of higher risk, and gets lower return. So, the result of both finance companies do not support the slogan of higher the risk, higher the return and vice Versa.

4.3 Presentation, Analysis and Interpretation of Data of Banking and Finance Companies based on Trend of Return

Trend analysis depicts the trends in the operation of the company. The trend analysis indicates the direction of change that helps in studying the position of banking and finance companies and change thereof overtime and determine whether there has been an improvement or deterioration in the financial condition and performance overtime. Under this section, the data are presented, interpreted and analyzed. Graphical presentations of those values are also presented below.

4.3.1 Trend Analysis of Return of Commercial Banks (Regarding Return on Assets as a Rate of Return)

Table No. 23

Banks	Trend Equation Y = a + bX	Trend Values				
		2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
BOKL	Y = 1.64 + 0.1730X	1.29	1.47	1.64	1.81	1.99
HBL	Y = 1.39 + 0.1710X	1.05	1.22	1.39	1.56	1.73
NBBL	Y =-5.04 + 0.1420X	-5.32	-5.18	-5.04	-4.90	-4.76
NIBL	Y = 1.57 + 0.1610X	1.25	1.41	1.57	1.73	1.89
NICBL	Y = 1.32 + 0.0810X	1.16	1.24	1.32	1.40	1.48

Source: The data of every bank except NBBL for FY 2004/2005 is taken from previous thesis consulting in the library and the data of every bank except NBBL for FY 2005/2006 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com and the data of NBBL for FY 2004/2005 to FY 2008/2009 is obtained from NEPSE website www.nepalstock.com.

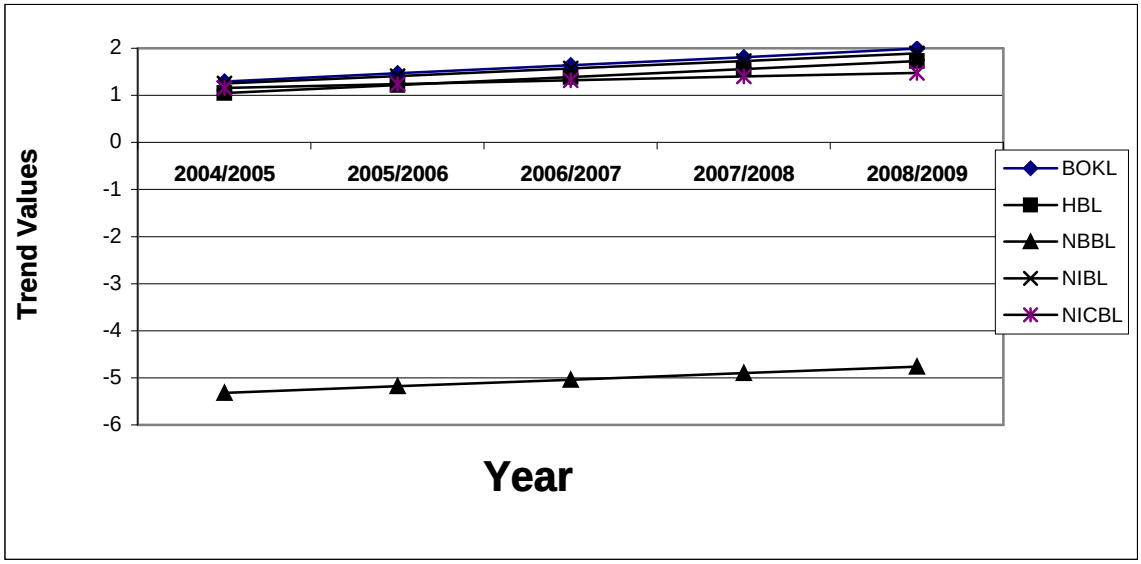


Figure No.16

The trend of return, trend equation and trend values are presented in above table number 23 and figure number 16 based on return on assets of five commercial

banks for five years. The trend equation is used for time series analysis. The trend values of each of the company for the five years are also presented in the same table and figure. The table number 23 and graph number 16 reveals positive trend values and negative trend values of the commercial banks.

BOKL, HBL, NIBL and NICBL have a positive trend and NBBL has a negative trend of return. BOKL has the highest positive growth rate of 0.1730 times per year. HBL has second highest growth rate of 0.1710 times per year. On the other side, NICBL has the lowest positive trend of 0.0810 times per year.

4.3.2 Trend Analysis of Return of Finance Companies (Regarding Return on Assets as a Rate of Return)

Table No. 24

Finance Companies	Trend Equation Y = a + bX	Trend Values				
		2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
NFL	Y = 2.17-0.23X	2.63	2.40	2.17	1.94	1.71
PFL	Y = 1.42-0.31X	2.04	1.73	1.42	1.11	0.80

Source: The data of both finance companies for FY 2003/2004 to FY 2007/2008 are obtained from NEPSE website www.nepalstock.com.

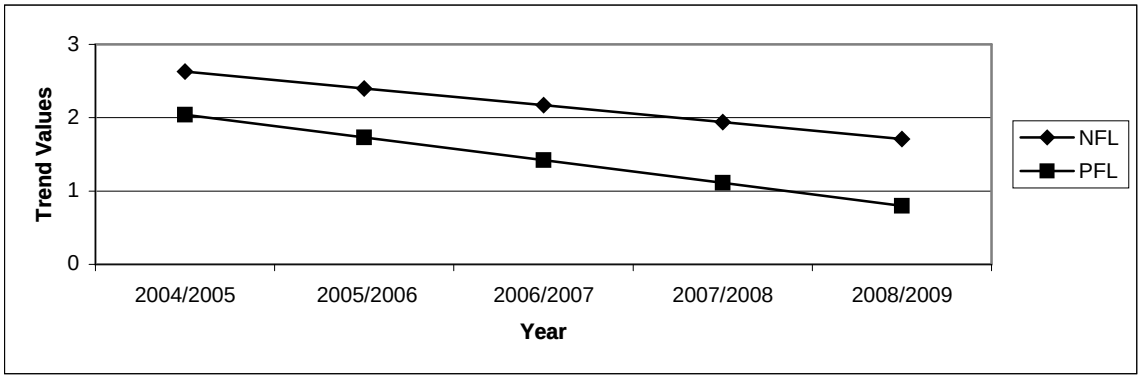


Figure No.17

Above table number 24 and figure number 17 both show the trend of equation, the trend of return and trend values based on return on assets of two finance companies for five years. The trend equation is used for time series analysis. Predicted value of each of the company for five years is presented in the same table and figure. The table number 24 shows negative trend equation for both companies and the figure number 17 also shows the positive trend values of negative trend equation for every year in both companies.

NFL and PFL have negative trend of return. NFL has the lowest declining rate of 0.23 times per year but PFL has the highest declining rate of 0.31 times per year.

4.3.3 Trend Analysis of Return of Commercial Banks (Regarding Return on Shareholder's Equity as a Rate of Return)

Table No. 25

Banks	Trend Equation Y = a + bX	Trend Values				
		2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
BOKL	Y = 58.99 - 2.22X	63.43	61.21	58.99	56.77	54.55
HBL	Y = 37.42 + 0.89X	35.64	36.53	37.42	38.31	39.20
NBBL	Y = 49.67 - 15.94X	81.55	65.61	49.67	33.73	17.79
NIBL	Y = 41.55 + 2.57X	36.41	38.98	41.55	44.12	46.69
NICBL	Y = 60.86 + 1.91X	57.04	58.95	60.86	62.77	64.68

Source: The data of every bank except NBBL for FY 2004/2005 is taken from previous thesis consulting in the library and the data of every bank except NBBL for FY 2005/2006 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com and the data of NBBL for FY 2004/2005 to FY 2008/2009 is obtained from NEPSE website www.nepalstock.com.

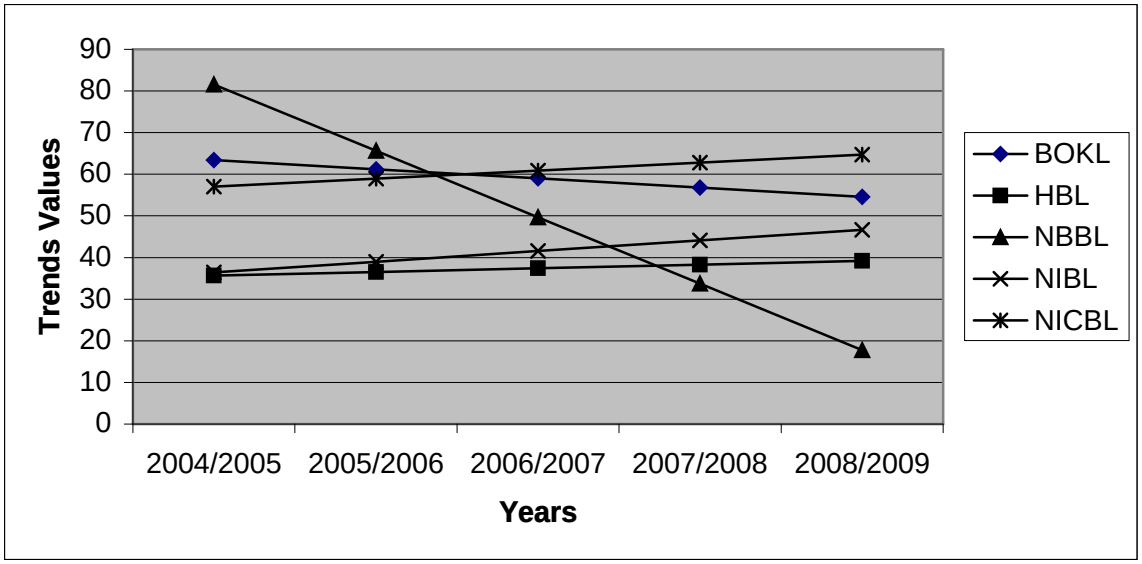


Figure No.18

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The above table number 25 and figure number 18 expose predicated rate of return (trend value) based on return on shareholder's equity of commercial banks for each year respectively by using least square method. Trend equation is also presented in the same table. Table number 25 and figure number 18 contain both types of trend positive and negative in the institution.

HBL, NIBL and NICBL have the positive trend value of return. BOKL and NBBL have the negative trend. NIBL has the highest growth trend rate of 2.57 times per year. NICBL has the second positive trend rate of 1.91. BOKL has the lowest declining rate of 2.22 times per year; NBBL has the highest declining rate of 15.94 times per year.

4.3.4 Trend Analysis of Return of Finance Companies (Regarding Return on Shareholder's Equity as a Rate of Return)

Table No. 26

Finance Companies	Trend Equation Y = a + bX	Trend Values				
		2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
NFL	Y = 57.95 - 7.69X	73.33	65.64	57.95	50.26	42.57
PFL	Y = 52.57 - 14.83X	82.23	67.40	52.57	37.74	22.91

Source: The data of both finance companies for FY 2004/2005 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com.

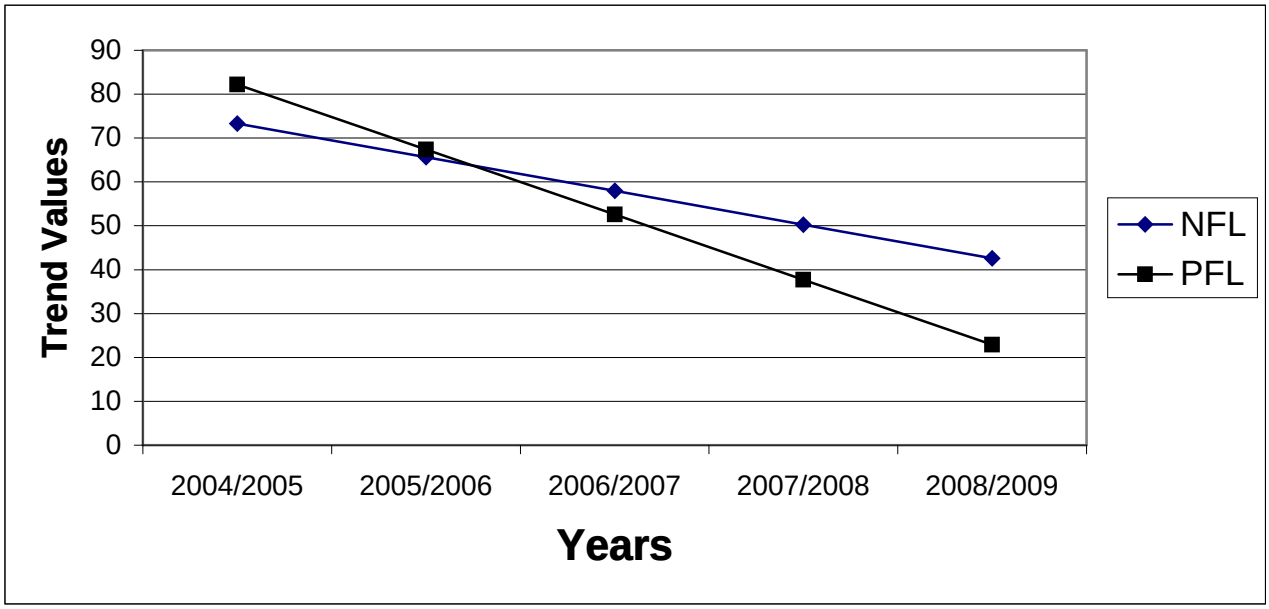

Figure No.19

Above table number 26 and figure number 19 contain trend of return, trend equation, and trend value based on return on shareholder's equity of finance companies for five years by using least square method. They represent negative trend. Negative represents the declining position.

NFL and PFL both have the positive trend values of negative trend equation. NFL has the lowest declining rate of 7.69 times per year and PFL has the highest declining rate of 14.83 times per year.

4.3.5 Trend Analysis of Return of Commercial Banks (Regarding Dividend Payout Ratio as a Rate of Return)

Table No.27

Banks	Trend Equation Y = a + bX	Trend Values				
		2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
BOKL	Y = 34.68 - 7.66X	50.00	42.34	34.68	27.02	19.63
HBL	Y = 19.91 + 0.06X	19.79	19.85	19.91	19.97	20.03
NBBL	Y = 0.00 + 0.00X	0.00	0.00	0.00	0.00	0.00
NIBL	Y = 20.47 - 8.17X	36.81	28.64	20.47	12.30	4.13
NICBL	Y = 10.70 - 3.77X	18.24	14.47	10.70	6.93	3.16

Source: The data of every bank except NBBL for FY 2004/2005 is taken from previous thesis consulting in the library and the data of every bank except NBBL for FY 2005/2006 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com and the data of NBBL for FY 2004/2005 to FY 2008/2009 is obtained from NEPSE website www.nepalstock.com.

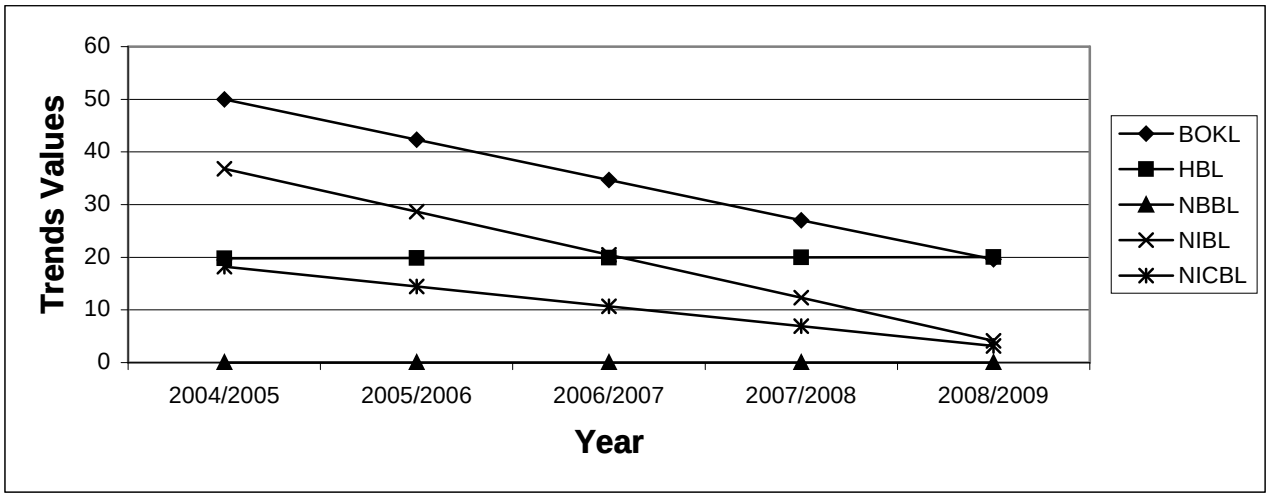

Figure No. 20

The above table number 27 and figure number 20 present the trend of return; predicted (trend) value and trend equation based on dividend payout ratio of selected five commercial banks for five years. They indicate that there are negative and positive trend in commercial banks.

Concerning table number 27 and figure number 20, it can be pointed that HBL has only positive growth rate of 0.06. NBBL has not trend values of return for every year. Similarly, BOKL, NIBL and NICBL have the negative trend rate of 7.66, 8.17 and 3.77 times per year respectively. NIBL has the highest declining rate of 8.17 times per year.

4.3.6 Trend Analysis of Return of Finance Companies (Regarding Dividend Payout Ratio as a Rate of Return)

Table No. 28

Finance Companies	Trend Equation Y = a + bX	Trend Values				
		2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
NFL	Y = 0.23 - 0.17X	0.57	0.40	0.23	22.83	22.66
PFL	Y = 11.13 + 0.08X	10.97	11.05	11.13	11.21	11.29

Source: The data of both finance companies for FY 2004/2005 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com.

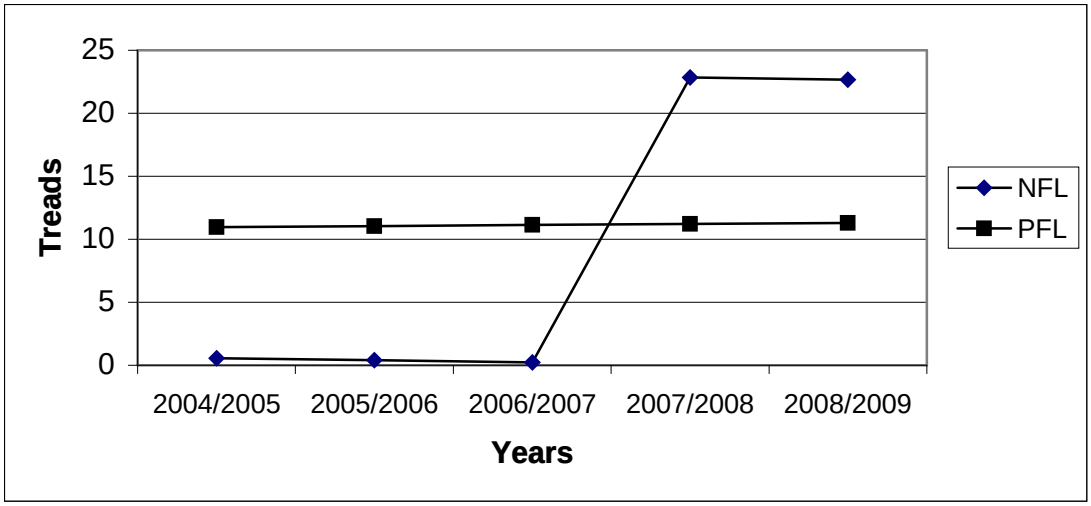

Figure No. 21

Above table number 28 and figure number 21 show the trend equation, trend of return and trend values based on dividend payout ratio of finance companies for five years. They contain negative trend and positive trend in the institution.

Looking table number 28 and figure number 21, it can be pointed that NFL has negative trend having declining rate of 0.17 times per yea. Similarly PFL has positive trend having growth rate of 0.08 times per year.

4.3.7 Trend Analysis of Return of Commercial Banks (Regarding Dividend Yield as a Rate of Return)

Table No.29

Banks	Trend Equation Y = a + bX	Trend Values				
		2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
BOKL	Y = 2.09 - 0.88X	3.85	2.97	2.09	1.21	0.33
HBL	Y = 0.97 - 0.04X	1.05	1.01	0.97	0.93	0.89
NBBL	Y = 0.00 + 0.00X	0.00	0.00	0.00	0.00	0.00
NIBL	Y = 1.01 - 0.45X	1.91	1.46	1.01	0.56	0.11
NICBL	Y = 0.60 - 0.26X	1.12	0.86	0.60	0.34	0.08

Source: The data of every bank except NBBL for FY 2004/2005 is taken from previous thesis consulting in the library and the data of every bank except NBBL for FY 2005/2006 to FY 2008/2009 are obtained from NEPSE website

www.nepalstock.com and the data of NBBL for FY 2004/2005 to FY 2008/2009 is obtained from NEPSE website www.nepalstock.com.

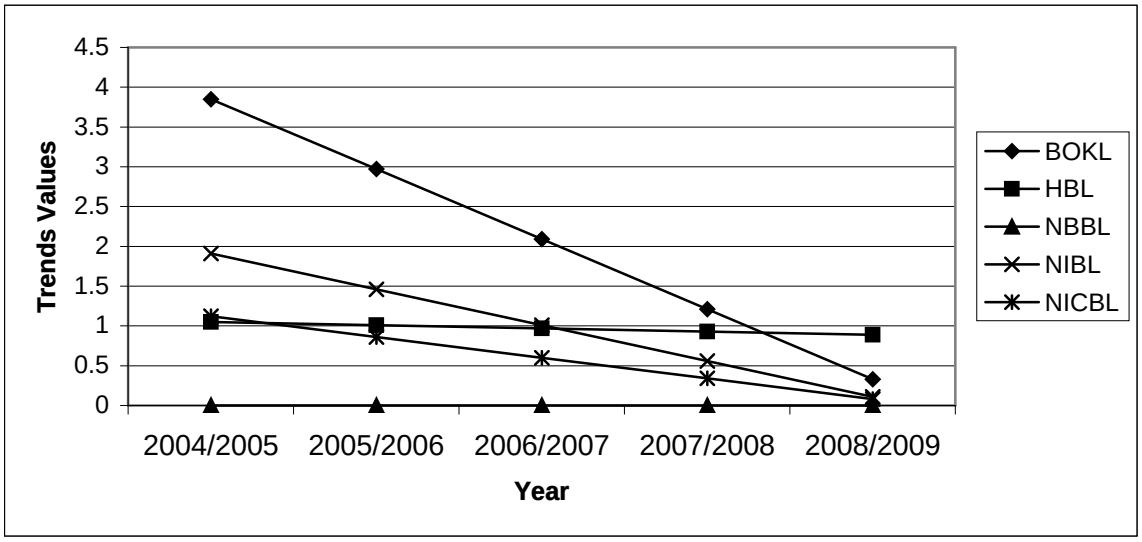

Figure No. 22

Above table number 29 and figure number 22 reveal the trend of return, trend values and trend equation based on dividend yield of selected five commercial banks for five years.

Going through the table number 29 and figure number 22, we found that four banks have positive trend values of negative trend equation but NBBL has no trend values because of it has not trend equation. BOKL has the highest declining rate of 0.88 times per year. HBL has the least declining rate of 0.04 times per year.

4.3.8 Trend Analysis of Return of Finance Companies (Regarding Dividend Yield as a Rate of Return)

Table No. 30

Finance Companies	Trend Equation Y = a + bX	Trend Values				
		2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
NFL	Y = 0.03 - 0.03X	0.09	0.06	0.03	0.00	-0.03
PFL	Y = 2.23 - 0.36X	2.95	2.59	2.23	1.87	1.51

Source: The data of both finance companies for FY 2004/2005 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com.

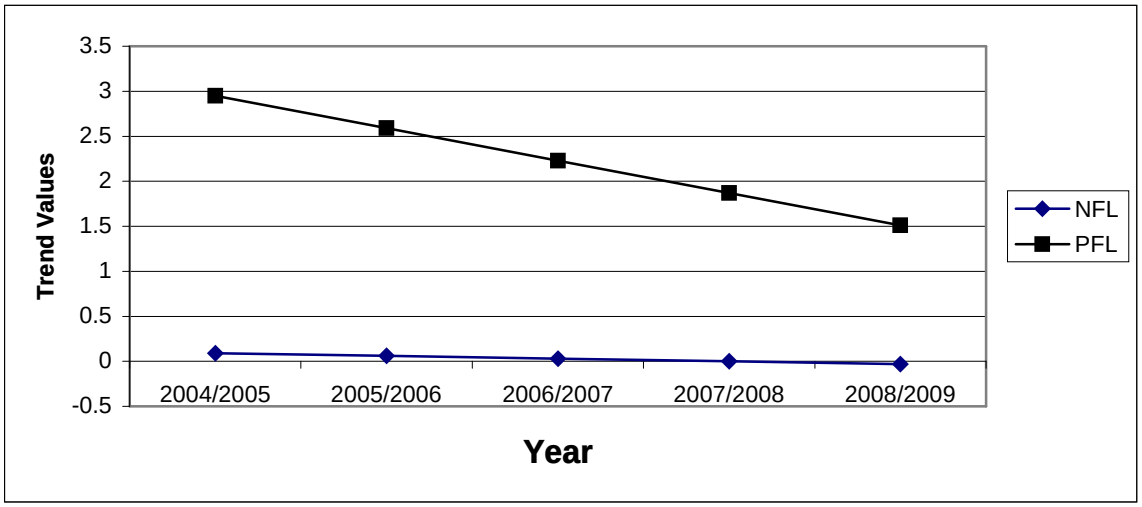

Figure No.23

The trend of return, trend equation and trend values are presented in above table number 30 and figure number 23 on the basis of dividend yield of selected two finance companies for five years. The predicted values are presented that are calculated by least square method. The table number 30 and figure number 23 have negative trend of return prevalent in finance companies.

Concerning through table number 30 and figure number 23, it reveals that PFL has positive trend values of negative trend equation but NFL has positive trend values of negative trend equation from FY 2004/2005 to FY 2007/2008 and it has only one negative trend value of negative trend equation on FY 2008/2009. Between

two finance companies, NFL has the lowest declining rate of 0.03 times per year and PFL has the highest declining rate of 0.36 times per year.

4.2.10 Trend Analysis of Return of Commercial Banks (Regarding Earning Yield as a Rate of Return)

Table No. 31

Banks	Trend Equation	Trend Values				
	Y = a + bX	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
BOKL	Y = 5.45 - 1.72X	8.89	7.17	5.45	3.73	2.01
HBL	Y = 4.64 - 0.69X	6.02	5.33	4.64	3.95	3.26
NBBL	Y = -35.69 + 3.78X	-43.25	-39.47	-35.69	-31.91	-28.13
NIBL	Y = 4.23 - 0.76X	5.75	4.99	4.23	3.47	2.71
NICBL	Y = 4.06 - 1.21X	6.48	5.27	4.06	2.85	1.64

Source: The data of every bank except NBBL for FY 2004/2005 is taken from previous thesis consulting in the library and the data of every bank except NBBL for FY 2005/2006 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com and the data of NBBL for FY 2004/2005 to FY 2008/2009 is obtained from NEPSE website www.nepalstock.com.

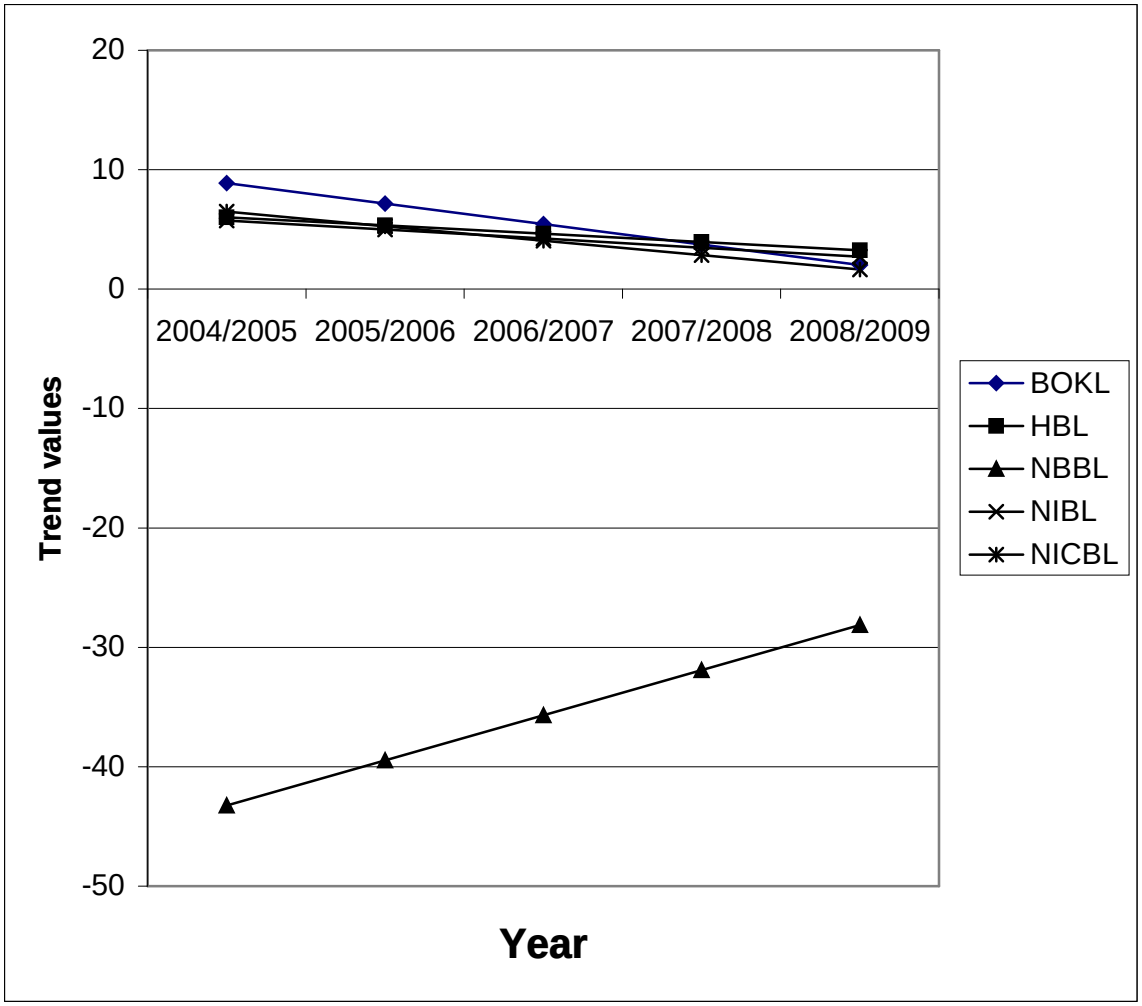

Figure No.24

The trend of return, trend equation and trend value are presented in above table number 31 and figure number 24 on the basis of earning yield of selected five commercial banks for five years. The predicted values are also presented that are calculated by using least square method. Negative trend value refers to declining rate per year.

Concerning through table number 31 and figure number 24, it shows that four banks have positive trend values of negative trend equation but NBBL has negative trend values of negative trend equation. BOKL has the highest declining rate of 1.72 times per year. HBL has the lowest decline rate of 0.69 times per year.

4.3.11 Trend Analysis of Return of Finance Companies (Regarding Earning Yield as a Rate of Return)

Table No. 32

Finance Companies	Trend Equation Y = a + bX	Trend Values				
		2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
NFL	Y = 11.45 - 2.64X	16.73	14.09	11.45	8.81	6.17
PFL	Y = 14.92 - 4.96X	24.84	19.88	14.92	9.96	5.00

Source: The data of both finance companies for FY 2004/2005 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com.

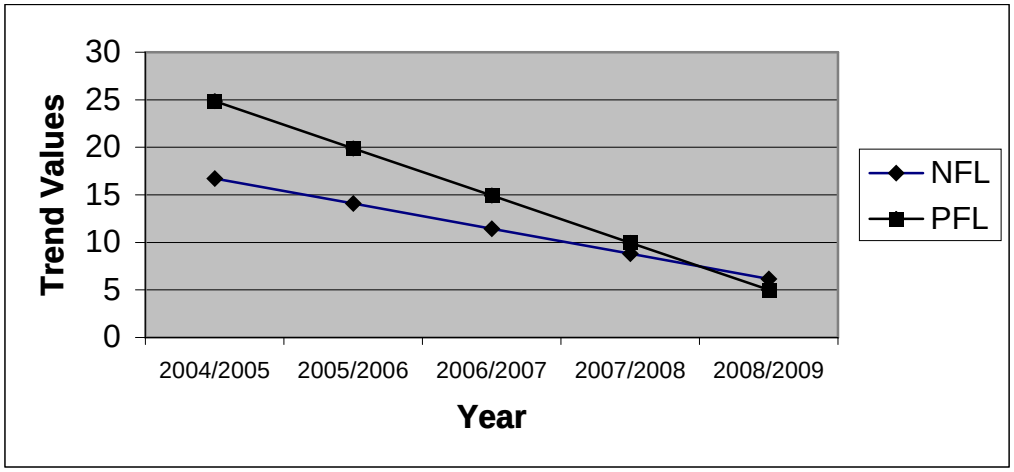

Figure No.25

The trend of return, trend equation and trend values are presented in above table number 32 and figure number 25 on the basis of earning yield of selected two finance companies for five years. The predicted values are presented that are calculated by least square method. The table number 32 and figure number 25 all have negative trend of return prevalent in finance companies.

Concerning through table number 32 and figure number 25, it reveals that all selected finance companies have positive trend values of negative trend

equations. Between two finance companies, NFL has the lowest declining rate of 2.64 times per year. PFL has the highest declining rate of 4.96 times per year.

4.3.12 Trend Analysis of Return of Commercial Banks (Regarding Price Earning Ratio as a Rate of Return)

Table No. 33

Banks	Trend Equation	Trend Values				
	Y = a + bX	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
BOKL	Y = 22.85 + 7.22X	8.41	15.63	22.85	30.07	37.29
HBL	Y = 22.85 + 3.65X	15.55	19.20	22.85	26.50	30.15
NBBL	Y = 95.81 - 94.24X	284.29	190.05	95.81	1.57	-92.67
NIBL	Y = 25.90 + 5.55X	14.80	20.35	25.90	31.45	37.00
NICBL	Y = 30.22 + 8.89X	12.44	21.33	30.22	39.11	48.00

Source: The data of every bank except NBBL for FY 2004/2005 is taken from previous thesis consulting in the library and the data of every bank except NBBL for FY 2005/2006 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com and the data of NBBL for FY 2004/2005 to FY 2008/2009 is obtained from NEPSE website www.nepalstock.com.

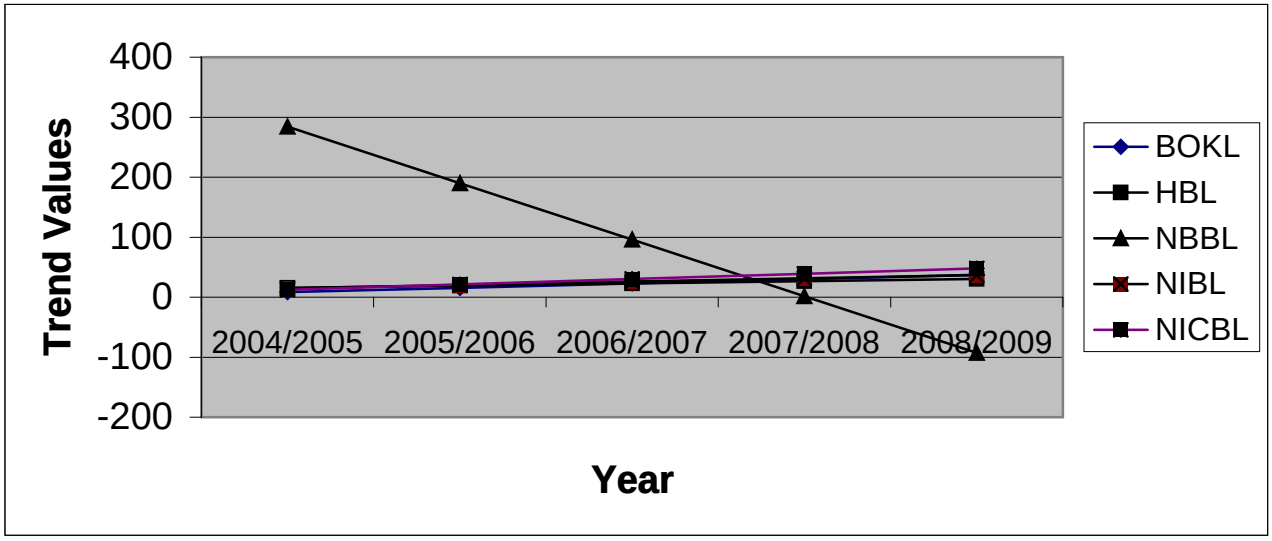

Figure No.26

Above table number 33 and figure number 26 shows the trend of return, trend value and trend equation on the basis of price earning ratio of selected commercial banks for five years. They contain both types of trend (positive and negative).

Concerning table number 33 and figure number 26, it can be pointed that BOKL, HBL, NIBL and NICBL all have positive growth rate of 7.22, 3.65, 5.55 and 8.89 times per year respectively. Similarly, NBBL has only the negative trend rate of 94.24 times per year. NICBL has the highest growth rate of 8.89 times per year and BOKL has second highest growth rate of 7.22 times per year. Similarly, HBL has the lowest growth rate of 3.65 times per year.

4.3.13 Trend Analysis of Return of Finance Companies (Regarding Price Earning Ratio as a Rate of Return)

Table No. 34

Finance Companies	Trend Equation Y = a + bX	Trend Values				
		2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
NFL	Y = 15.93 + 8.79X	-1.65	7.14	15.93	24.72	33.51
PFL	Y = 5.78 - 0.30X	6.38	6.08	5.78	5.48	5.18

Source: The data of both finance companies for FY 2004/2005 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com.

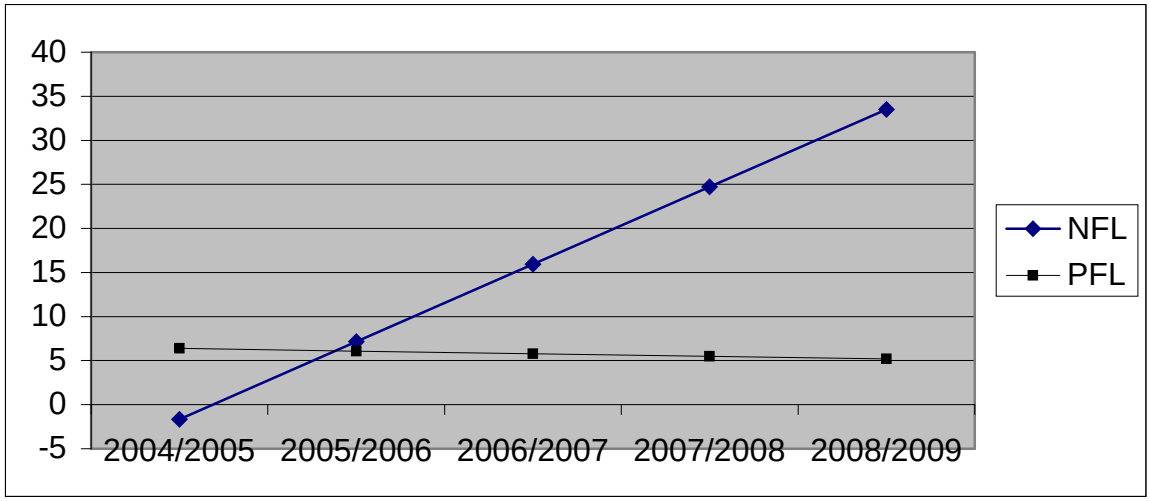

Figure No.27

Above table number 34 and figure number 27 both show the trend equation, trend of return and trend values based on price earning ratio of two finance companies for five years. They contain negative trend and positive trend in the institution.

Looking table number 34 and figure number 27, it can be pointed that NFL has positive trend having growth rate of 8.79 times per year. Similarly, PFL has negative trend of return. Negative trend represents declining rate of return. Positive trend represents increasing rate of return.

4.3.14 Trend Analysis of Return of Commercial Banks (Regarding Earning Power Ratio as a Rate of Return)

Table No. 35

Banks	Trend Equation Y = a + bX	Trend Values				
		2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
BOKL	Y = 4.91 + 0.09X	4.73	4.82	4.91	5.00	5.09
HBL	Y = 4.26 + 0.26X	3.74	4.00	4.26	4.52	4.78

NBBL	Y = 0.06 + 0.23X	-0.40	-0.17	0.06	0.29	0.52
NIBL	Y = 4.67 + 0.26X	4.15	4.41	4.67	4.93	5.19
NICBL	Y = 5.17 + 0.24X	4.69	4.93	5.17	5.41	5.65

Source: The data of every bank except NBBL for FY 2004/2005 is taken from previous thesis consulting in the library and the data of every bank except NBBL for FY 2005/2006 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com and the data of NBBL for FY 2004/2005 to FY 2008/2009 is obtained from NEPSE website www.nepalstock.com.

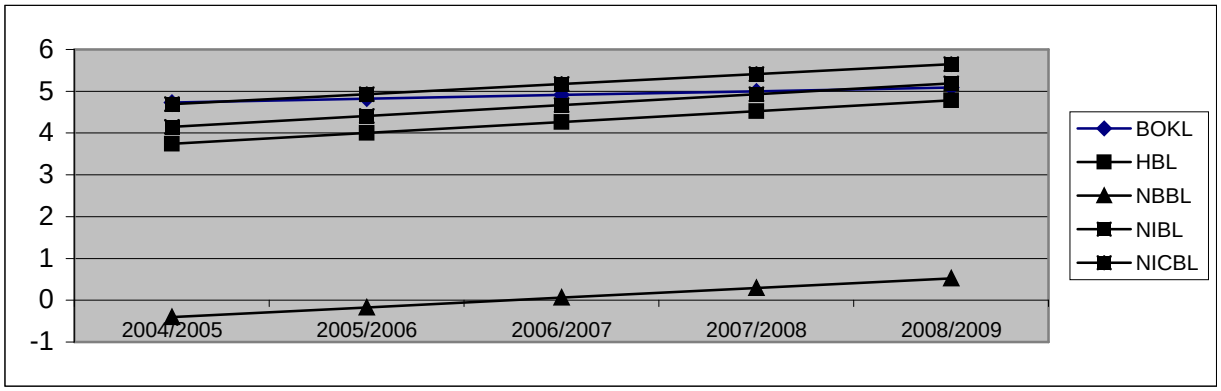

Figure No.28

The trend of return, trend equation and trend values are presented in above table number 35 and figure number 28 on the basis of earning power ratio of selected commercial banks for five years. The predicted values are also presented that are calculated by using least square method. A positive trend value refers to the growing rate per year while negative trend value refers to the declining rate per year.

Concerning through table number 35 and figure number 28, it shows that BOKL, HBL, NIBL and NICBL have positive trend values. Likewise, NBBL has negative trend values from FY 2004/2005 to FY 2005/2006 and it has positive trend values from FY 2006/2007 to FY 2008/2009. HBL and NIBL have the highest growth rate of 0.26 times per year and BOKL has the lowest positive growth rate of 0.09 times per year.

4.3.15 Trend Analysis of Return of Finance Companies (Regarding Earning Power Ratio as a Rate of Return)

Table No. 36

Finance Companies	Trend Equation Y = a + bX	Trend Values				
		2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
NFL	Y = 8.58 - 1.32X	11.22	9.90	8.58	7.26	5.94
PFL	Y = 7.64 - 1.36X	10.36	9.00	7.64	6.28	4.92

Source: The data of both finance companies for FY 2004/2005 to FY 2008/2009 are obtained from NEPSE website www.nepalstock.com.

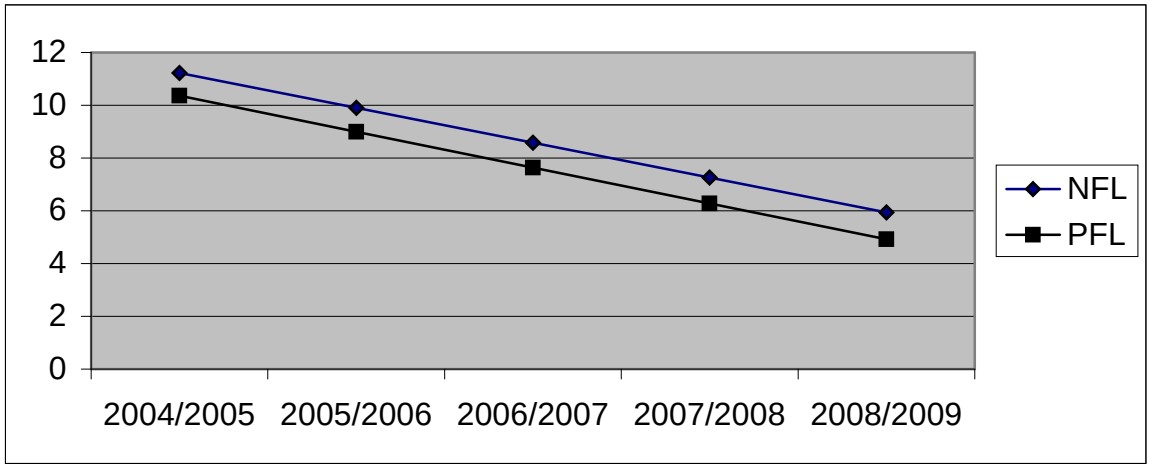

Figure No.29

Above table number 36 and figure number 29 both show the trend of return, trend value and trend equation on the basis of earning power ratio of selected finance companies for five years. They contain only negative trend of return.

Concerning through table number 36 and figure number 29, it reveals that all selected finance companies have positive trend values of negative trend equations. Among two finance companies, NFL has the lowest declining rate of 1.32 times per year and PFL has the highest declining rate of 1.36 times per year.

4.4 Presentation and Analysis of Data using Inferential Analysis

Inferential analysis is based on the sampling and statistics. It is a good way to estimate of population parameters. Attempts are, therefore, made to estimate the population parameters to predict the future outcomes i.e. to estimate relationship between the risk and return in the case of banking sector under the study. For this purpose, sector-wise correlation coefficients have been computed between the entire mean and their coefficient of variation on the basis of different profitability ratios of banking sectors. And student's t-value has also been calculated to test the statistical significance correlation ship of all the calculated correlation coefficient.

Following table number 37 contains the figures relating to the coefficient of correlation between the mean rate of return and the coefficient of variation of the rate of return and computed t-values of the correlation coefficient pertains to the banks under the study.

Sector-Wise Analysis of Coefficient of Correlation(r) and Student's t-values(/t/) on the basis of Different Profitability Ratios of Banking Sectors

Table No. 37

S. No.	Ratios	r	r^2	/t/
1.	ROA	0.9979	0.9958	26.6728
2.	ROSE	-0.0913	0.0083	0.1588
3.	DPR	0.1272	0.0162	0.2221
4.	DY	0.1088	0.0118	0.1895
5.	EY	0.9912	0.9825	12.9766
6.	PER	0.9930	0.9860	14.5385
7.	EPR	-0.9875	0.9752	10.8597

The tabulated value of t for 5-2 = 3 degree of freedom at 5% (two-tail) significance level is 3.182.

In the case of banking sector, the coefficient of correlation between risk and return is positive in five ratios and two negative out of seven ratios employed for the study. The positive correlation coefficient pertains to Return on Assets (0.9979), Dividend Payout Ratio (o.1272), Dividend Yield (o.1088), Earning Yield (0.9912) and Price Earning Ratio (o.9930). Similarly, negative correlation coefficient pertains to Return on Shareholder's Equity (-0.0913) and Earning Power Ratio (-0.9875). The coefficient of determination of risk and return shows the effect of other variables are 99.58% on ROA, 0.83% on ROSE, 1.62% on DPR, 1.18% on DY, 98.25% on EY, 98.60% on PER and 97.52% on EPR out of 100%.

From above short analysis, it reveals that, the case of banking sector, the relationship between risk and return are positive and negative i.e. higher the risk higher the return and lower the risk lower the return.

Testing of Hypothesis

H_O: There is no significant correlationship between risk defined in terms of coefficient of variation and return defined in terms of the average of a number of profitability ratios of various banking companies under the study.

H_1: There is significant correlationship between risk defined in terms of coefficient of variation and return defined in terms of the average of a number of profitability ratios of various banking sectors under the study.

The computed t-values are less than the tabulated value (3.182) in respect of Return on Shareholder's Equity (0.1588), Dividend Payout Ratio (0.2221) and

Dividend Yield (0.1895). In these cases null hypothesis (H_O) is accepted and alternative hypothesis (H_1) is rejected. Similarly, the computed t-values are higher than the tabulated value (3.182) in respect of Return on Assets (26.6728), Earning Yield (12.9766), Price Earning Ratio (14.5385) and Earning Power Ratio (10.8597). In these cases, null hypothesis (H_O) is rejected and alternative hypothesis (H_1) is accepted.

CHAPTER -V
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

For the entire development of any country, each and every sector should be strong and capable. Among them, economic sector is one of the major sectors. Banks and financial institutions are playing vital role in the economic development of the country. So, if there is insufficient of banking and financial facilities, the growth of economy development is decreased. Banks and financial institutions assist in economic development by mobilizing short term as well as long-term capital needed for the productive sectors.

Especially, banks and finance companies provide various facilities to the people engaged in industry, trade and commerce. So, they are being the means for the uplift of society.

This chapter basically involves with the summary, conclusions and recommendations derived from the study of Risk and Return Analysis of Banking and Finance Companies. This chapter makes an attempt to draw the summary, conclusions of the study and the final section gives recommendations to solve the problems on the basis of the findings.

5.2 Summary

Investment decision-making is one of the major functions of financial management. It is primarily concerned with determining an optimal investment project in maximizing shareholders′ wealth. It needs a rational evaluation of the alternative courses of actions, which entails risk and return analysis as risk and return are involved in each of the alternative courses of action. Risk and return is

one of the most important aspects of the financial decision. The stakeholders are interested to know about the risk and return position of the institution.

When people and firm save their income to invest for future income, financial systems allow them to earn an additional income on the accumulated saving which is termed as a return on investment. Generally, rate of return on an investment is measured on the basis of annual percentage rate, which is a cash gain plus accrued capital gain.

Risk is fear of being loss or the chances of loss. It is said that the possibility of the actual return from holding a security will deviate from an expected return. An asset is considered risky when its future returns are highly volatile. The risk associated with an investment can be measured by computing standard deviation, coefficient of variation, and beta and so on of the stream of returns.

Security holders always prefer a higher return from their holding taking a minimum level of risk. But theoretically, if they want to secure a higher return should also assume a higher risk and assuming a lower risk, they should remain satisfied with lower return and there is positive relationship between risk and return.

Based on this assumption, that is, there is positive relationship between risk and return, some previous studies have been done and some important theories such as portfolio theory, capital asset pricing model have been emerged. But there is lack of knowledge about the actual relationship between risk and return due to insufficient empirical evidence. The present study has, therefore, focused on the analysis of risk and return with reference to seven companies selected from financial sector such as banking and finance companies.

The study has used financial tools and statistical tools to analyze. Financial tools such as Return on Assets, Return on Shareholder's Equity, Dividend Payout Ratio, Dividend Yield, Earning Yield, Price Earning Ratio and Earning Power Ratio are computed to represent Profitability Ratios. Statistical tools such as Arithmetic Mean, Standard Deviation, Coefficient of Variation, Trend Analysis, Karl

Pearson's Correlation Coefficient and Student's t-test for banks are computed. To compute the different profitability ratios and other measures published financial statements (secondary data) of sampled companies are derived from previous thesis consulting in the library and NEPSE website www.nepalstock.com. The financial statements of the year 2004/2005 to 2008/2009 are used in this study.

Since the study is descriptive and inferential, descriptive analysis has involved the inter-firm analysis of risk and return on the basis of different profitability ratios of banks and finance companies and inferential analysis has only involved the inter-sector analysis of risk and return of banks by testing of hypothesis with the help of Karl Pearson's correlation coefficient and Student's t-test.

5.3 Conclusions of the Study

Since the study involves both descriptive as well as inferential analysis, the major conclusions derived from descriptive and inferential analysis are as follows:

1. In term of return on assets under the banking, NIBL is the best because it has the second highest mean return on assets and the lowest coefficient of variation and NBBL is the worst because it has the negative coefficient of variation and the negative mean return on assets.
2. The return on assets and their coefficient of variation of the firm under finance companies, NFL is better than PFL because coefficient of variation of NFL is less than coefficient of variation of PFL.
3. The return on shareholder's equity and their coefficient of variation of the firm under banking companies NICBL is good because it has the highest mean return on shareholder's equity and lowest coefficient of variation and NBBL is the worst because it has the highest coefficient of variation but third lowest return.

4. The return on shareholder's equity and their coefficient of variation of the firm under finance companies show that NFL is the best in term of the highest mean return on shareholder's equity and the lowest coefficient of variation and PFL is the worst in term of the lower mean return on shareholder's equity and the highest coefficient of variation.
5. The dividend payout ratio and their coefficient of variation of the banking sectors, BOKL is the best because in term of the highest mean return and the lowest coefficient of variation. NICBL is the worst in term of the lowest mean return and the highest coefficient of variation.
6. The dividend payout ratio and their coefficient of variation of the finance sectors, PFL is the best because it has the highest mean return and the lowest coefficient of variation. NFL is the worst because it has the highest coefficient of variation and the lowest mean return.
7. The dividend yield and their coefficient of variation of the banking sectors, BOKL is the best in term of the highest mean return and the lowest coefficient of variation. NICBL is the worst in term of the lowest return and the highest risk.
8. The dividend yield and their coefficient of variation of the finance sectors, PFL is the best in term of the highest mean return and the lowest risk or coefficient of variation. NFL is the worst in term of the lowest returns and the highest risk or highest coefficient of variation.
9. The earning yield and their coefficient of variation of the banking sectors, HBL is the best in term of the second highest mean return and the lowest coefficient of variation. NBBL is the worst in term of the negative return and negative coefficient of variation.
10. The earning yield and their coefficient of variation of the finance companies, NFL is the best in term of the lowest coefficient of variation. PFL is the worst in term of the highest coefficient of variation.

11. The price earning ratio and their coefficient of variation of the banking sectors, HBL is the best in term of the lowest coefficient of variation. NBBL is the worst in term of the highest coefficient of variation.
12. The price earning ratio and their coefficient of variation of finance sectors, PFL is the best in term of the lowest coefficient of variation. NFL is worst in term of the highest coefficient of variation.
13. The earning power ratio and their coefficient of variation of the banking sectors, BOKL is the best in term of the second highest mean return and the lowest coefficient of variation. NBBL is the worst in term of the lowest mean return and the highest coefficient of variation.
14. The earning power ratio and their coefficient of variation of the finance sectors, NFL is the best in term of the highest return and the lowest coefficient of variation. PFL is the worst in term of the lowest return and the highest coefficient of variation.
15. BOKL has the highest increasing trend rate and NICBL has the lowest increasing trend based on return on asset trend under banking sectors. NFL has the lowest decreasing trend rate and PFL has the highest decreasing trend rate based on return on asset under finance sectors.
16. NIBL has the highest increasing trend rate and NBBL has the highest decreasing trend rate based on return on shareholder's equity under banking sectors. All finance companies have negative trend. NFL has the lowest decreasing trend rate but PFL has the highest decreasing trend rate under finance sectors.
17. HBL has the positive trend but NBBL has no trend rate and remaining all have negative trend. NIBL has the highest decreasing trend rate but NICBL has the lowest decreasing trend rate based on dividend payout ratio under banking sectors. NFL has the negative trend rate of 0.17 but PFL has the positive trend rate of 0.08 based on dividend payout ratio under finance companies.

18. All banks have negative trend rate. Among them, BOKL has the highest declining trend rate but HBL has the lowest declining trend rate based on dividend yield under banking sectors. In finance sectors, there are also negative trend rate. Between them NFL has the lowest declining trend rate but PFL has the highest declining trend rate based on dividend yield.
19. NBBL has only growth rate of 3.78 and remaining all banks have declining rate based on earning yield. BOKL has the highest declining trend rate but HBL has the lowest declining trend rate. Under finance sectors, all have negative trend. NFL has the lowest decreasing trend rate and PFL has the highest decreasing trend rate based on earning yield.
20. Only NBBL has the negative trend rate of 94.24 and remaining all have positive trend rate based on price earning ratio under banking sectors. Among them, NICBL has the highest growth rate of 8.89 and HBL has the lowest growth rate of 3.65. Under finance sectors, NFL has the positive trend rate of 8.79 and PFL has the negative trend rate of 0.30 based on price earning ratio.
21. Under banking sectors, all banks have positive trend. Among them, HBL and NIBL have the highest growth rate but BOKL has the lowest growth rate based on earning power ratio. Similarly, under finance sectors, there are negative trend. NFL has the lowest decreasing trend rate but PFL has the highest decreasing trend rate based on earning power ratio.
22. There is positive correlationship between the risk and return in many cases of profitability ratios of banking sectors ROA, DPR, DY, EY and PER except in case of ROSE and EPR. Calculation based on ROA, DPR, DY, EY, and PER suggest that there is significant correlationship between risk and return. Calculation based on ROSE and EPR suggest that there is no significant correlationship between risk and return.

The final conclusion based on above data analysis, interpretation and major findings both show that the result does not support the proverb of

"Higher the risk, higher the return and lower the risk, lower the return" in many cases of banking and finance companies. It is just opposite to the proverb. In lower risk, return is higher and in higher risk, return is lower is found in this case. In short, it is concluded that the "Higher the risk, higher the return and lower the risk, lower the return" is not suitable in many cases of banking and finance companies.

5.4 Recommendations

The followings are the major recommendations of the study:

1. The company-wise analysis of profitability ratios have shown that firms such as HBL, NBBL, NICBL and PFL have the low return on assets under their respective companies. In order to improve their return on assets, these companies should utilize the resources properly and they should also reduce both operating as well as non-operating expenses.
2. Similarly with regard to their return on shareholder's equity firms such as BOKL, HBL, NBBL and PFL have shown the worst performance under their respective companies. In order to improve their return, these companies should attempt to make strategy for strong position in the market.
3. The dividend payout ratio of HBL, NICBL and NFL is low in their respective companies and NBBL did not pay the dividend to its shareholders from FY 2004/2005 to FY 2008/2009. If the companies have sufficient earning, they can raise the payment of dividend to their shareholders in the company.
4. The dividend yield of HBL, NICBL and NFL is very low in their respective companies and NBBL has no dividend yield. Hence, they should try to improve their dividend yield.
5. The earning yield of NBBL, NICBL and PFL is low in their respective companies. These companies should attempt to enhance their earning and they should also make strategy to be strong position in the market.

6. The price earning ratio of BOKL, NBBL, NICBL and NFL is very low in their respective companies. These companies should attempt to enhance their price earning.
7. The earning power ratio of NBBL, NIBL and PFL is low in their respective companies. These companies should attempt to enhance their earning power ratio.
8. The banking and finance companies should try to extend the services in remote areas also for the regional development of the country.
9. The findings of the descriptive analysis of the study may be useful to the rational investors who want to maximize their returns while keeping risk within controllable level. These findings have pointed out that the investors can identify companies in which high returns are accomplished by low risk. Thereafter, they can rank the identified companies in term of risk and return. The process can help them ever to format optimum portfolio of investment.
10. The findings of the study are also important to mutual funds companies which seek to earn a sufficient return on investment to satisfy the aspirations of their investor and create reserves for mutual funds. These mutual funds can conduct a regular and detailed analysis of the behavior of risk and return for companies falling under different companies. This would help them in identifying the best possible portfolio for investing the firms′ raised from the general public.

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APPENDIX

APPENDIX-1

Nepal Stock Exchange Ltd.					
Singhdarbar Plaza, Kathmandu					
Some Key Figures of B/S And P/L Account With brief financial indicators of Bank of Kathmandu Ltd.					
	Audited	Audited	Audited	Audited	Unaudited
	2061/62	2062/63	2063/64	2064/65	2065/66
	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Brief Financial Indicators					
Earning per share	27.50	30.10	43.67	43.50	61.55
Dividend per share	10.00	15.00	18.00	20.00	0.00
Market price per share	295	430	850	1375	2350
	Rs. In Million	Rs. In Million	Rs. In Million	Rs. In Million	Rs. In Million
Capital Structure					
Authorized capital	1000.00	1000.00	1000.00	1000.00	1000.00
Issued capital	500.00	500.00	500.00	606.17	606.17
Liabilities					
Issued and paid up capital	463.58	463.58	463.58	603.14	603.14
Reserve & surplus	187.16	257.16	376.15	378.84	150.09
Debenture	0.00	0.00	200.00	200.00	200.00
Borrowings	912.15	6.00	553.18	730.00	100.00
Deposits	7741.64	8975.78	10485.36	12388.93	15745.40
Others	191.82	186.01	200.06	269.19	1049.85
Total	9496.35	9888.53	12278.33	14570.10	18448.48
Assets					
Cash & bank balance	782.88	579.34	533.31	1102.54	1392.74
Investment	2477.41	3088.31	4164.14	3465.08	3279.51
Loan, advances & overdraft	5646.70	5912.58	7259.08	9399.33	12747.72
Fixed assets	83.63	95.23	110.75	320.85	411.80
Others	505.73	213.07	211.05	282.30	616.71
Total	9496.35	9888.53	12278.33	14570.10	18448.48
Profit and Loss Account					
Interest income	567.10	607.10	718.12	819.00	1033.95
Other operating income	143.73	148.93	166.70	197.26	246.64
Non operating income (net)	15.46	-0.47	9.76	34.74	19.32
Total income	726.29	755.56	894.58	1051.00	1299.91
Expenditures					
Interest expenses	286.30	241.64	308.16	339.18	417.45
Overhead expenses (employees)	47.73	53.82	59.12	69.74	90.60
Operating expenses (office mgmt)	187.09	99.19	117.59	138.43	168.32
Loan loss provision		133.92	78.38	81.89	34.65
Provision for bonus	20.52	22.70	30.12	38.34	53.54
Total expenditure	541.64	551.27	593.37	667.58	764.56
Profit before tax	184.65	204.29	301.21	383.42	535.35
Tax provision	57.17	64.76	98.77	121.02	164.11
Net profit after tax & interest	127.48	139.53	202.44	262.40	371.24

APPENDIX-2

Nepal Stock Exchange Ltd.					
Singhdarbar Plaza, Kathmandu					
Some Key Figures of B/S And P/L Account With brief financial indicators of Himalayan Bank Ltd.					
	Audited	Audited	Audited	Audited	Unaudited
	2061/62	2062/63	2063/64	2064/65	2065/66
	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Brief Financial Indicators					
Earning per share	49.05	47.91	59.24	60.66	64.57
Dividend per share	0.00	11.58	30.00	15.00	0.00
Market price per share	840	920	1100	1740	1980
	Rs. In Million	Rs. In Million	Rs. In Million	Rs. In Million	Rs. In Million
Capital Structure					
Authorized capital	1000.00	1000.00	1000.00	1000.00	2000.00
Issued capital	650.00	650.00	772.20	810.81	1013.51
Liabilities					
Issued and paid up capital	536.25	643.50	772.20	810.80	1013.51
Reserve & surplus	787.92	898.25	993.98	1335.69	1789.60
Debenture	360.00	360.00	360.00	360.00	860.00
Borrowings	299.01	146.05	144.62	235.97	10.00
Deposits	22010.34	24814.01	26490.85	30048.42	31939.87
Others	768.52	556.35	698.74	728.26	2035.36
Total	24762.04	27418.16	29460.39	33519.14	37648.34
Assets					
Cash & bank balance	2001.19	1890.68	1401.68	1449.79	1396.72
Investment	9292.11	12257.22	12209.98	13840.56	13858.70
Loan, advances & overdraft	11951.87	12424.52	14642.56	16998.00	20179.61
Fixed assets	299.64	295.82	540.82	574.06	997.91
Others	1217.23	549.92	665.35	656.73	1215.40
Total	24762.04	27418.16	29460.39	33519.14	37648.34
Profit and Loss Account					
Interest income	1245.89	1446.47	1626.47	1775.58	1978.29
Other operating income	270.43	311.42	415.90	385.19	463.21
Non operating income (net)	3.30	-85.46	55.55	100.26	124.62
Total income	1519.62	1672.43	2097.92	2261.03	2566.12
Expenditures					
Interest expenses	491.54	561.96	648.84	767.41	823.76
Overhead expenses (employees)	152.51	178.59	234.59	272.23	297.26
Operating expenses (office mgmt)	337.29	277.38	329.70	341.56	341.28
Loan loss provision	70.98	73.90	145.15	90.69	52.97
Provision for bonus	46.73	58.06	67.24	71.74	95.53
Total expenditure	1099.05	1149.89	1425.52	1543.63	1610.80
Profit before tax	420.57	522.54	672.40	717.40	955.32
Tax provision	157.52	214.27	214.94	225.58	300.92
Net profit after tax & interest	263.05	308.27	457.46	491.82	654.40

APPENDIX-3

Nepal Stock Exchange Ltd.					
Singhdarbar Plaza, Kathmandu					
Some Key Figures of B/S And P/L Account With brief financial indicators of Nepal Bangladesh Bank Ltd.					
	Audited	Audited	Audited	Audited	Unaudited
	2061/62	2062/63	2063/64	2064/65	2065/66
	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Brief Financial Indicators					
Earning per share	0.74	-104.12	-249.65	-147.47	72.83
Dividend per share					
Market price per share	354	265	199	550	565
	Rs. In Million	Rs. In Million	Rs. In Million	Rs. In Million	Rs. In Million
Capital Structure					
Authorized capital	1500.00	1500.00	1500.00	1500.00	1500.00
Issued capital	1000.00	1000.00	1000.00	1000.00	1000.00
Liabilities					
Issued and paid up capital	359.92	719.86	719.86	719.86	744.13
Reserve & surplus	296.65	- 485.28	-2282.44	-3344.02	-3103.26
Debenture					
Deposits	12807.38	12125.58	13015.14	9385.95	9801.44
Others	794.02	916.99	256.73	492.76	2947.76
Total	14257.97	13277.15	11709.29	7254.55	10390.07
Assets					
Cash & bank balance	1436.47	1401.77	7694.68	1164.05	735.53
Investment	2699.17	2411.72	2691.86	1084.56	829.01
Loan, advances & overdraft	8648.74	7787.69	6460.26	4409.01	6379.40
Fixed assets	191.18	189.30	172.33	140.81	150.94
Others	1282.41	1486.67	690.16	456.12	2295.19
Total	14257.97	13277.15	17709.29	7254.55	10390.07
Profit and Loss Account					
Interest income	1095.50	876.51	758.13	982.20	530.51
Other income	231.69	206.67	468.68	302.31	630.32
Total income	1327.19	1083.18	1226.81	1284.51	1160.83
Expenditures					
Interest expenses	625.36	547.94	518.09	432.22	294.93
Overhead expenses (employees)	76.62	95.88	140.66	112.55	93.42
Operating expenses (office mgmt)	113.76	161.34	119.90	114.33	79.40
Non-operational expenses			11.11		
Loan loss provision	400.73	905.15	1882.28	1502.80	
Provision for bonus	11.07	22.39			63.01
Others			271.57		
Total expenditure	1227.54	1732.70	2943.61	2161.90	530.76
Profit before tax	99.65	-649.52	-1716.8	-877.39	630.07
Tax provision	97.00	100.00	80.35	184.20	88.11
Net profit after tax & interest	2.65	-749.52	-1797.15	-1061.59	541.96

APPENDIX- 4

Nepal Stock Exchange Ltd.					
Singhdarbar Plaza, Kathmandu					
Some Key Figures of B/S And P/L Account With brief financial indicators of Nepal Investment Bank Ltd.					
	Audited	Audited	Audited	Audited	Unaudited
	2061/62	2062/63	2063/64	2064/65	2065/66
	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Brief Financial Indicators					
Earning per share	51.70	39.50	59.35	62.57	58.01
Dividend per share	15.00	12.50	20.00	5.00	0.00
Market price per share	940	800	1260	1729	2450
	Rs. In Million	Rs. In Million	Rs. In Million	Rs. In Million	Rs. In Million
Capital Structure					
Authorized capital	590.59	590.59	590.59	801.35	1203.92
Issued capital	0.00	0.00	0.00	0.00	0.00
Liabilities					
Issued and paid up capital	295.29	587.74	590.59	801.35	1203.92
Reserve & surplus	433.75	592.43	824.85	1076.77	1574.85
Debenture	0.00	300.00	550.00	800.00	1050.00
Borrowing	361.50	50.00	0.00	0.00	0.00
Deposits	11524.67	14254.57	18927.31	24488.86	34451.73
Others	640.27	278.80	437.39	423.87	1128.65
Total	13255.48	16063.54	21330.14	27590.85	39409.15
Assets					
Cash & bank balance	1226.92	1154.50	2088.63	2145.33	3754.94
Investment	3862.48	4260.16	5920.76	7164.83	6874.02
Loan, advances & overdraft	7130.13	10126.06	12776.21	17286.43	27529.32
Fixed assets	249.79	320.59	343.45	759.46	970.09
Others	786.16	202.23	201.09	234.80	280.78
Total	13255.48	16063.54	21330.14	27590.85	39409.15
Profit and Loss Account					
Interest income	731.40	886.80	1172.74	1584.99	2194.28
Other operating income	180.55	221.18	277.59	346.57	447.51
Non operating income (net)	1.77	37.18	11.09	68.20	149.87
Total income	913.72	1145.62	1461.42	1999.76	2791.66
Expenditures					
Interest expenses	326.21	354.55	490.95	685.53	991.83
Overhead expenses (employees)	89.75	97.00	111.05	145.37	187.15
Operating expenses (office mgmt)	135.14	182.92	200.22	243.43	309.60
Loan loss provision	105.43	140.41	103.81	129.72	181.53
Provision for bonus	25.72	37.08	50.49	72.34	101.96
Total expenditure	682.25	811.96	956.52	1276.39	1772.07
Profit before tax	231.47	333.66	504.90	723.37	1019.59
Tax provision	78.87	101.53	154.38	221.98	321.17
Net profit after tax & interest	152.60	232.13	350.52	501.39	698.42

APPENDIX- 5

Nepal Stock Exchange Ltd.					
Singhdarbar Plaza, Kathmandu					
Some Key Figures of B/S And P/L Account With brief financial indicators of Nepal Industrial & Commercial Bank Ltd.					
	Audited	Audited	Audited	Audited	Unaudited
	2061/62	2062/63	2063/64	2064/65	2065/66
	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Brief Financial Indicators					
Earning per share	13.66	22.75	16.10	24.01	26.37
Dividend per share	0.00	10.00	0.53	1.50	0.00
Market price per share	218	366	496	950	1284
	Rs. In Million	Rs. In Million	Rs. In Million	Rs. In Million	Rs. In Million
Capital Structure					
Authorized capital	1000.00	1000.00	1000.00	1000.00	1600.00
Issued capital	500.00	500.00	600.00	660.00	950.40
Liabilities					
Issued and paid up capital	499.96	500.00	600.00	660.00	943.88
Reserve & surplus	120.43	184.19	166.46	257.99	374.93
Debenture	0.00	0.00	200.00	200.00	200.00
Borrowing	60.02	450.37	457.71	352.13	335.00
Deposits	5146.49	6241.38	8765.95	10068.23	13078.53
Others	103.17	134.45	193.48	140.48	315.54
Total	5930.07	7510.39	10383.60	11678.83	15247.88
Assets					
Cash & bank balance	319.30	907.08	594.96	444.34	1192.35
Investment	1760.73	1766.09	2987.61	1917.90	2471.47
Loan, advances & overdraft	3561.14	4711.70	6655.96	8941.40	11264.68
Fixed assets	43.29	59.50	39.86	153.68	194.40
Others	245.61	66.02	105.21	221.51	124.98
Total	5930.07	7510.39	10383.60	11678.83	15247.88
Profit and Loss Account					
Interest income	363.04	457.61	579.98	725.82	941.46
Other operating income	53.63	60.89	75.08	106.47	120.93
Non operating income (net)	0.04	1.11	0.06	0.41	23.03
Total income	416.71	519.61	655.12	832.70	1085.42
Expenditures					
Interest expenses	183.59	225.99	340.22	421.37	505.96
Overhead expenses (employees)	35.23	39.00	45.49	54.92	71.41
Operating expenses (0ffice mgmt)	48.36	51.63	57.36	64.63	80.01
Loan loss provision	41.98	19.95	60.91	37.77	25.41
Provision for bonus	10.75	18.30	13.74	23.09	36.60
Total expenditure	319.91	354.87	517.72	601.78	719.39
Profit before tax	96.80	164.74	137.40	230.92	366.03
Tax provision	28.53	50.97	40.80	72.43	117.09
Net profit after tax & interest	68.27	113.77	96.60	158.49	248.94

APPENDIX- 6

Nepal Stock Exchange Ltd.					
Singhdarbar Plaza, Kathmandu					
Some Key Figures of B/S And P/L Account With brief financial indicators of Narayani Finance Ltd.					
	Audited	Audited	Audited	Audited	Unaudited
	2061/62	2062/63	2063/64	2064/65	2065/66
	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Brief Financial Indicators					
Earning per share	33.98	33.05	32.51	36.58	15.92
Dividend per share	0.2	0.18			
Market price per share	220	260	235	275	805
	Rs. In Million	Rs. In Million	Rs. In Million	Rs. In Million	Rs. In Million
Capital Structure					
Authorized capital	100.00	100.00	200.00	200.00	200.00
Issued capital	50.00	50.00	100.00	100.00	100.00
Liabilities					
Issued and paid up capital	29.87	35.49	42.17	50.11	50.11
Reserve & surplus	14.38	19.06	24.04	24.27	31.63
Deposits	367.19	411.65	495.59	582.27	616.72
Others	16.69	19.65	23.63	33.46	37.04
Total	428.13	485.85	585.43	690.11	735.50
Assets					
Cash & bank balance	18.15	28.64	36.24	49.74	28.16
Investment	60.40	66.90	109.62	93.53	131.38
Loan, advances, overdraft & bills purchase	327.63	369.07	413.86	523.36	549.55
Fixed assets	19.24	18.19	19.29	18.83	18.38
Others	2.71	3.05	6.24	4.65	8.03
Total	428.13	485.85	585.43	690.11	735.50
Profit and Loss Account					
Interest income	47.80	52.73	58.90	67.46	34.23
Other income	6.00	5.50	5.38	9.37	7.92
Total income	53.80	58.23	64.28	76.83	42.15
Expenditures					
Interest expenses	30.56	30.74	33.89	36.99	19.97
Overhead expenses (employees)	2.64	3.33	3.37	3.59	1.95
Operating expenses (office mgmt)	3.06	3.30	3.95		
Loan loss provision	1.23	1.90	1.86	2.87	5.19
Provision for bonus	1.80	1.72	1.90	2.59	1.17
Others				4.86	2.22
Total expenditure	39.29	40.99	44.97	50.90	30.50
Profit before tax	14.51	17.24	19.31	25.93	11.65
Tax provision	4.36	5.51	5.60	7.64	3.67
Net profit after tax & interest	10.15	11.73	13.71	18.29	7.98

APPENDIX-7

Nepal Stock Exchange Ltd.					
Singhdarbar Plaza, Kathmandu					
Some Key Figures of B/S And P/L Account With brief financial indicators of Premier Finance Ltd.					
	Audited	Audited	Audited	Audited	Unaudited
	2061/62	2062/63	2063/64	2064/65	2065/66
	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Brief Financial Indicators					
Earning per share	16.9	34.05	30.63	16.28	
Dividend per share		6.00	6.00	3.00	
Market price per share	117	123	120	235	250
	Rs. In Million	Rs. In Million	Rs. In Million	Rs. In Million	Rs. In Million
Capital Structure					
Authorized capital	40.00	40.00	100.00	100.00	100.00
Issued capital	20.00	20.00	50.00	50.00	50.00
Liabilities					
Issued and paid up capital	20.00	20.00	24.00	28.80	33.12
Reserve & surplus	6.08	6.88	12.79	11.81	7.49
Deposits	247.07	244.29	283.87	313.26	365.57
Others	17.05	22.36	12.54	13.91	184.09
Total	290.20	293.53	333.20	367.78	590.27
Assets					
Cash & bank balance	73.37	35.30	50.79	35.12	25.66
Investment	15.76	26.77	31.76	41.80	43.08
Loan, advances, overdraft & bills purchase	185.14	208.57	243.94	282.73	497.17
Fixed assets	2.37	7.86	1.88	4.19	4.28
Others	13.56	15.03	4.83	3.94	20.08
Total	290.20	293.53	333.20	367.78	590.27
Profit and Loss Account					
Interest income	27.60	35.83	34.27	42.29	18.98
Other income	5.86	4.33	3.37	3.57	2.17
Total income	33.46	40.16	37.64	45.86	21.15
Expenditures					
Interest expenses	18.93	19.04	18.81	24.59	12.88
Overhead expenses (employees)	2.24	3.09	2.89	3.79	2.09
Operating expenses (office mgmt)	3.29	3.75			
Loan loss provision		2.51	0.66	3.95	1.90
Provision for bonus	0.66	1.13	1.04	0.74	
Others	2.54	0.61	3.78	5.42	3.45
Total expenditure	27.66	30.13	27.18	38.49	20.32
Profit before tax	5.80	10.03	10.46	7.37	0.83
Tax provision	2.42	3.22	3.11	2.68	0.00
Net profit after tax & interest	3.38	6.81	7.35	4.69	0.83