OPTIMAL PORTFOLIO WITH IN THE COMMON STOCK INVESTMENT OF INSURANCE COMPANIES IN NEPAL

By

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RECOMMENDATION

This is to certify that the Thesis

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Entitled:

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STOCK INVESTMENT OF INSURANCE

COMPANIES IN NEPAL

has been prepared as approved by this Department in the prescribed format of the Faculty of Management. This thesis is forwarded for examination.

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DECLARATION

I hereby declare that the work reported in this thesis entitled "**Optimal Portfolio with in the Common Stock Investment of Insurance Companies in Nepal"** submitted to Office of the Dean, Faculty of Management, Tribhuvan University, is my original work done in the form of partial fulfillment of the requirement for the Master's Degree in Business Study (M.B.S.) under the supervision of **Dr**. **Shilu Manandhar Bajracharya** and **Pitri Raj Adhikari** of Shanker Dev Campus.

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ABBREVIATIONS

CAPM	-	Capital Assets Pricing Model
CML	-	Capital Market Line
Cov	-	Coefficient of variance
CS	-	Common Stock
CV	-	Covariance
DPS	-	Dividend per Share
EICL	-	Everest Insurance Company Limited
F/Y	-	Fiscal Year
GON	-	Government of Nepal
HBL	-	Himalayan Bank Ltd.
HGICL	-	Himalayan General Insurance Co. Ltd.
HPR	-	Holding Period Return
MPS	-	Market Price per Share
NABIL	-	Nepal Arab Bank Ltd
NBBL	-	Nepal Bangladesh Bank Ltd.
NEPSE	-	Nepal Stock Exchange Limited
NICL	-	Nepal Insurance Company Limited
PICNL	-	Premier Insurance Co. (Nepal) Ltd.
S.D.	-	Standard Deviation
SCBNL	-	Standard Chartered Bank Nepal Ltd
SEBO/N	-	Securities Board of Nepal
SML	-	Security Market Line
UICNL	-	United Insurance Co. (Nepal) Ltd.

CHAPTER- I
INTRODUCTION

1.1 General Background

1.1.1 Investment

An investment is a commitment of funds made in the expectation of some positive rate of return. If the investment is properly undertaken, the return will be commensurate with the risk the investor assumes. Investments generally involve real assets of financial assets. Real assets are tangible, material things such as buildings, automobiles, and text books. Financial assets are pieces of paper representing an indirect claim to real assets held by someone else. These pieces of paper represent debt or equity commitments in the form of IOUs or stock certificates. Among the many properties that distinguish real from financial assets, one of special interest to investors is liquidity. Liquidity refers to ease of converting an asset into money quickly, conveniently, and at little exchange cost. Real assets are more heterogeneous, often peculiarly adapted to a specific use, and yield benefits only in cooperation with other productive factors. In addition, returns on real assets are frequently more difficult to measure accurately, owing to the absence of board, ready, and active markets. An investment involves the sacrifice of current rupees for future rupees. The sacrifice takes place in the present and certain but the reward comes later and is generally uncertain. Return, risk and time are generally involved in the investment.

Investors may buy and sell financial assets in order to earn return on them. The return better known as reward form investments includes both current income and capital gains or losses that arise by increase or decrease of the security price. Return is the income received in investment. People invest their wealth with an expectation of getting some reward for leaving its liquidity; they are only investing in those opportunities where they can get higher return. Hence,

Investor wants favorable return to be yield by its stock, and go for those, which Yield more.

Risk is inseparable from return. Risk in fact is an indication of chance of losing investment values. Different people interpret risks in different ways. To some, it is simply a lack of definite outcome, which can be any unknown event, which may be unfavorable. It is a chance of happening some unfavorable event or danger of losing some material value. Risk in holding securities is generally associated with the possibility that realized returns will be less than the returns that were expected. The source of such disappoint is failure of dividends (interest) and/or the security's priced to materialize as expected. The investment process must be considered in terms of both aspects risk and return.
Another important factor in investment is the time, which offers several different courses of action. Time period depends on the attitude of the investor who follows a "buy and hold" policy. As time moves on, analysts believe that conditions changes and investors reevaluate expected return and risk for each investment.

The investment process describes how an investor should go about making decisions with regard to what marketable securities to invest in, how extensive the investment should be, and when the investment should be made.
A five step procedure for making decisions forms the basis of investment process.

a. Set Investment Policy

The first step of investment process is to set the investment policy which Involves determining the investor's objectives and the amount of investable Wealth. Investor objective should be stated in terms of both risk and return.
The investor policy may either Profit maximization or Wealth maximization. So first of all investor should set their policy.

b. Security Analysis

In this step investor should analysis the movement of security either by Technical analysis or Fundamental analysis.

(1) Technical Analysis

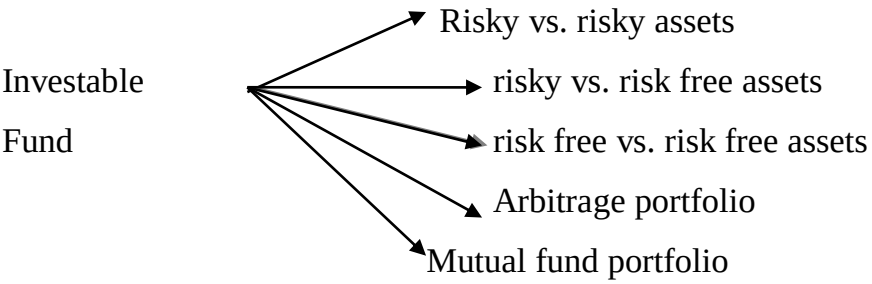
Technical analysis is related to what would be the price in the future? It uses the different historical data trend either of industry or individual firm by using chart pie-chart and diagram and show possibility of movement of stock price in coming day. So it has the assumption of "some history may repeat". Involves the study of stock market price in an attempt to predict future price movements for the common stock of a particular firm.

(2) Fundamental Analysis

Fundamental analysis is concerned with what should be the price of stock or bond or preferred stock in future? I.e. fundamental analysis is calculating the value of security by either factual or estimated data from financial statement like Income statement Balance sheet funds flow/cash flow etc. so, Fundamental analysis begins with intrinsic value of any financial asset equals to present value of all cash flows that the owner of the asset expects to receive. Once the intrinsic value of the common stock of a particular firm has been determined, it is compared with the security's current market price of the common stock. If the current market price of the common stock is below the intrinsic value, a purchase is recommended. Conversely, if the current market price is above this intrinsic value, a sale is recommended.

c. Portfolio Construction

in this stage investor make a portfolio through



In this step Construction of portfolio involves identification of specific securities in which to invest, along with the proportion of investable wealth to be put into each security. Here, selectivity, timing and diversification need to be addressed by the investors.

d. Portfolio Revision

in this step review of making investment is done in term of profitability, security, investable time and risk. The investor must balance the costs of moving to the new portfolio against the benefits of revision. This step is just revision of construction of portfolio.

e. Portfolio Performance Evaluation

The fifth step in the investment process, portfolio performance evaluation, involves determining periodically how the portfolio performed in terms of risk and return, and compares the performance with that of an appropriate "benchmark" portfolio. Other portfolio performance evaluation techniques like Sharpe index, Traynor's index, Jenson's index, CV per unit etc. and certain financial software are used.

1.1.2 Portfolio

A portfolio is a combination of investment assets. The portfolio is the holding of securities and investment in financial assets i.e. bond, stock. Individual securities have risk-return characteristics of their own. Portfolios may or may not take on the aggregate characteristics of their individual part. Portfolio analysis thus takes the ingredients of effects of combining securities and considers the blending or interactive effects of combining securities. The portfolio management is characterized by Tradition Approach and Modern Approach. In traditional approach, portfolio planning called for the selection of those securities that best fit the personal needs and desires for the investors. For example, a young, aggressive, single adult would be advised to buy stocks in newer, dynamic, rapidly growing firms. A retired widow would be advised to

purchase stocks and bonds in old-line, established, stable companies, such as utilities.

Modern Approach suggests that the traditional approach to portfolio analysis, selection, and management may well yield less than optimum results that a more scientific approach is needed, based on estimates of risk and return of the portfolio and the attitudes of the investor toward a risk-return in trade-off streaming from the analysis of the individual securities.

The return of the portfolio is nothing more than the weighted average of the returns of the individual stocks. The weights are based on the percentage composition of the portfolio. The total risk of the portfolio is more complex. Here we need only point out that securities when combined may have a greater or lesser risk than the sum of their component risks. This fact arises from the degree to which the returns of individual securities move together or interact.

1.1.3 Insurance Companies in Nepal

Insurance is a contract whereby one person (the insurer) undertakes to compensate another person (the assured) by paying him a sum of money on the happening of a specified event. The consideration for the insurer's promise is the payment by the assured of a sum known as the "premium". Insurance is therefore merely another form of contract for which a special type of rules was evolved over the years. Main purpose of contract of insurance is to protect the insured from of risk. So the insurer promises to pay on the happening of a specified event. The insurance contract is a device whereby the risk of financial loss accruing from death or disability, or damage to the property is passed on to another. The insurer usually collects an agreed rate of contribution from a large number of people and relieves the insured by paying the insurance money. It does not to attempt to prevent the happening of the event insured, but it merely compensates the insured when the event insured against occurs.

The history of insurance business in Nepal is not as long as in other countries. As the economic was confined completely before 2007, the scope of insurance was also narrow to a large extent. Generally, the insurance activity in Nepal was executed by the Indian insurance companies prior to 2007. However, the history shows the introduction of insurance company named "Mal Chalani and Beema Co." in 2004. It was later converted into Nepal Insurance and Transport Company Pvt. Ltd. in 2016 which was again renamed as Nepal Insurance Company Ltd in 2048. Nepal is slowly opening its market to foreign investors. There are currently more than 20 insurers, including one credit insurer, in the market. Rastriya Beema Sansthan, a state-owned insurer, dominates the market, and holds about 80 percent and 15 percent of market shares in life and non-life insurance businesses. The Insurance Board, empowered by the Insurance Act of 1992 and the Insurance Rules of 1993, regulates and supervises the Nepalese insurance industry. It grants licenses, issues directives, and may take actions on observing any non-disciplinary activity of an insurer. The board created the Tariff Advisory Board in 1996, which is responsible primarily for ratemaking.

Main purpose of insurance is to protect the insured from of risk. So the insurer promises to pay on the happening of a specified event. The insurance contract is a device whereby the risk of financial loss accruing from death or disability, or damage to the property is passed on to another. The functions and importance of insurance companies can be pointed out as:

- To safeguard losses
- To extend protection
- Underwriting
- To facilitate funds
- To assist in economic development
- Managing claims and losses
- Assists to reduce inflation
- Motivates saving and means of investment

1.2 Statement of the Problem

Traditional investment analysis emphasizes the projection of price and dividends. That is, the potential price of a firm's common stock and the future dividend stream are forecast, and then discounted back to the present. The intrinsic value is then compared with the security's current market price. If the current market price is below the intrinsic value, a purchase is recommended. Conversely, if the current market price is above this intrinsic value, a sale is recommended. Although modern security analysis is deeply rooted in the fundamental concepts just outlined, the emphasis has shifted. The more modern approach to common stock analysis emphasis risk and return estimates rather than mere price and dividend estimates. The risk and return estimates are dependent on the share price and the accompanying dividend stream.

Investors are investing in shares following trial and error approach. Therefore, it is necessary to establish clear picture about the return from investing in securities. Not only risk and return but the variability in return is to be addressed. These factors i.e. risk and return are the most important factors influencing investment decisions and process. Existing and potential public investors are not well known about the real financial strengths and weaknesses of the public companies in which they are investing or going to invest their funds. This study is focused on the risk and returns analysis of individual insurance companies and estimates an optimal portfolio among common stock investment of insurance companies.

This study is conducted to provide basic and necessary information about investment and investment process. This current study will help to take an appropriate decision about how to set investment policies and how to analyze and evaluate the investment worthwhile over the different time period. The focus of the study is on the analysis of risk, return and portfolio, which will enable investors to guide the investment activities. Benefits of the study will be received by security businesspersons, issue managers, brokers, marketing

managers and general investors. This study work will be the valuable assets for the further research work.

1.3 Objective of the Study

Nepalese investors are facing various aforementioned problems in setting their investment policies, evaluating financial assets, constructing portfolio and revising and analyzing their portfolio performance. The key objectives of the study revolve around the subject of finding out risk minimizing tools and techniques in relation to certain financial as well as other constraints. The main and basic objective of this study is to estimate an optimal portfolio among CS investment of insurance companies. However, the objectives are as below:

- To explore the systematic and unsystematic risk associated with security under study.
- To determine whether the shares of insurance companies in Nepal are overpriced or underpriced by analyzing the risk and return characteristics of the individual shares.
- To evaluate common stock of insurance companies in terms of risk and return.
- To estimate an optimal portfolio among CS investment of insurance companies
- To find and recommend profitable industry sector to investor out of insurance company.

1.4 Significance of the Study

Traditional investment analysis emphasizes the projection of prices and dividends. That is, the potential price of a firm's common stock and the future dividend stream are forecast, then discounted back to the present. This intrinsic value is then compared with the security's current market price. If the current market price is above below the intrinsic value, a purchase is recommended. Conversely, if the current market price is above this intrinsic value, a sale is recommended. Although the modern security analysis emphasizes the risk and

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1.5 Hypothesis of the Study

This study will test the following hypothesis.

Hypothesis I

Null hypothesis H_0: $\mu = \mu_0$ i.e. there is no significance difference between the average return of insurance companies' common stock and overall market return. In other words, average return on the common stock of insurance companies is equal to the market return.

Alternative hypothesis H_A: $\mu \neq \mu_0$ i.e. there is significant difference between the average return of insurance companies' common stock and overall market return. In other words, average return on the common stock of insurance companies is not equal to the market return.

Hypothesis II

Null hypothesis H_0: $\mu_0 = \mu$ or $\mu = 1$, portfolio beta of the individual insurance companies' common stock is equal to 1. In other words, there is no significant difference between the portfolio beta of insurance companies' common stock and market beta.

Alternative hypothesis H_0: $\mu \neq \mu$ or $\mu \neq 1$, portfolio beta of the individual insurance companies' common stock is not equal to 1. In other words, there is significant difference between the portfolio beta of insurance companies' common stock and market beta.

Hypothesis III

Stock price of insurance companies are underpriced.

Hypothesis IV

Portfolio construction within same sector will not minimize risk significantly.

1.6 Limitation of the Study

This research work is not able to study the whole Nepalese capital market in detail due to various reasons. The study concentrates only on the insurance companies that are listed in NEPSE, ignoring others. Therefore, this study is not free from the limitations. The major limitations of the study are as follows:

- The overall study is based on the secondary data. So the incorrectness of the key source might affect the accuracy of the outcome of the study.
- Data of FY 2003/04 to 2008/09 are used for the study.
- Mainly the study is concentrated on risk, return and portfolio estimation of insurance companies.
- Among the different financial assets, only common stock is taken for the purpose of the study.

1.7 Organization of the Study

The study will be organized in six different chapters.

Chapter-I Introduction Chapter will describe the history of Insurance and number of insurance and statement of problem etc.

Chapter-II Review of Literature: this Chapter will concerned with this topic related Pre- thesis, news, analysis, journal books etc will describe.

Chapter-III Research methodology: in this chapter tools can be use like hypothesis, Markowitz theories, hypothesis etc.

Chapter-IV presentation & analysis of Data: in this chapter the available data relating to this study are tabulation and presentation.

Chapter-V Summary, conclusion and recommendations: this chapter will tell thing what finds and what to be in future.

Annex- in this Section Sources will describe and tabulated.

CHAPTER-II
REVIEW OF LITERATURE

2.1 Introduction

This chapter provides some review on the literature that is available in the topic risk, return and portfolio analysis. This section covers those studies that are conducted by academicians and scholars. In this part books, research works, journals and articles are reviewed.

2.2 Conceptual Framework

Before getting into the core subject matter, it is necessary to have general knowledge of risk, return and portfolio. Major focus is on analysis of risk, return, and portfolio within the common stock of selected insurance companies.

2.2.1 Common Stock

Common equity in a corporation or partnership or proprietorship interests in a unincorporated firm constitute the first source of funds to a new business and the base of support for borrowing by existing firms. There are 3 different instruments that include a capital structure such as common stock, preference stock, debt and so on. The most important one is common share or equity share or ordinary share. Common stock represents the ownership position in a corporation. Common stock is the first security of a corporation to be issued and in case of bankruptcy, the last to retired. They have the lowest- priority claim on earning and assets of all securities issue. Common stockholders have the power to elect the board of directors. Common stocks are generally fully pain and non-assessable i.e. the common stockholders may lose their initial investment, not more which means stockholders have limited liability to the share that they hold. In case of liquidity or bankruptcy, common stockholders are in the principal entitled only to assets remaining after all prior claimants have been satisfied. As expressed above, common stock is the most risky security, so, must be in its expected return as well. When investors buy

common stock, they Receive certificate of ownership as a part of there being part owners of the company. The certificate states the number of shares purchased and their par value.

Common stock has one important investment characteristic and one important speculative market price tends increase irregularly but persistently over the decades as their net worth builds through the reinvestment of undistributed earnings. However, most of the time common stocks are subject to irrational and excessive price function in both directions, as the consequence of the ingrained tendency of most people to speculative or gamble, i.e. to give way to hope fear and greed.

Of all the other forms of securities, common stock appears to be the most romantic, while fixed income investment avenue may be more important to most of the investors, equity shares seems to capture their interest the most. The potential reward and penalties associated with the equity make them an interesting even exciting proportion, no wonder; equity investment is a favorite topic for conservation in parties and get together.

Common stock holders of a corporation are its residual owners, their claim to income and assets comes after creditors and preferred stock holders have been paid in full. As a result, a stockholders return on investment is less certain than the return to lenders or to preferred stockholders. On the other hand, the shares of a common stock can be authorized either with or without par value. The par value of a stock is merely a stated figure in the corporate charter and is of little economic significance. A company should not issue stock at a price less than par value because stockholders who bought stock for less than par value would be liable to creditors for the difference between the below par price they paid and the par value.

2.2.2 Security Market

A security market can be defined as a mechanism for bringing together buyers and sellers of financial assets in order to facilitate trading. Security market exists in order to bring together buyers and sellers of securities. It means the market where the securities are treated.

One of the main functions is "price discovery" i.e. to cause prices to reflect currently available information. Security market can be distinguished into.

- Primary and Secondary Market
- Money and Capital Market

Primary Market

Securities offered for the first time to the general public through the primary securities markets. The issuer may be a brand new company or one that has been in business for many years. It is also known as New Issue Market (NIM).

Secondary Market

The Secondary Market is not keeping pace with the growth of the primary market. This is mainly due to lack of the needed efforts on the concerned authority to devise suitable package of measure to encourage the growth of broker networks in the country's growing stock exchange.

Money Market

Money Market is also called short term financial market which is the set of supplying short term debt or working capital needed for industries, business or incorporated etc. The instruments of money market are government securities, inter-bank deposits, banker's acceptance, certificate of deposit and commercial papers issued by non-financial institutions.

Capital Market

Capital Market is the market where the transaction of long-term finance is made. The funds collected in this market are raised and traded by long-term

financial instruments such as equities and bonds. From the capital market, the maturity preference of lender and borrower is adjusted. The lender can immediately get cash in case of need and borrower also receives long-term credit.

2.2.3 Market Price of the Share

Market price of Shares as the output of the demand and supply interaction is the most influencing factor in determining the price of the stock. In relation to the interacting forces of demand and supply i.e. Market Price is determined at given time and the prices and volumes of its past transaction are meaningful indication of probable relationship of future supply and demand pressure. And such relationship is the most important element in determining the probable direction of the price movements. If the demand exceeds the supply, the price will rise and if the supply exceeds the demand the price will fall.

2.2.4 Profit Maximization or Wealth Maximization

In the past, profit maximization was regarded as the only objective of business firms but in modern time, a firm has multiple objectives though some objectives may receive priority over other objectives. It is a rational behavior of the firm to maximize the profit. The financial manager should select the alternative having maximum monetary return. Profit maximization objective is short run objective where as wealth maximization objective is long run objective of the firm. When the time period is short and uncertainty is not much, profit maximization and wealth maximization are Short and uncertainty is not much, profit maximization and wealth maximization are almost same. The wealth of the shareholders is measured by the share price of the stock. The share price depends on the timing of returns, cash flow and risk. Generally the value or wealth can be expressed more explicitly in following ways.

$$w = \frac{A1}{(1+K)1} + \frac{A2}{(1+K)^2} + \frac{A3}{(1+K)3} + .. \frac{An}{(1+k)n} - C$$

$$= \sum_{t=1}^{n} \frac{A_t}{(1+k)n} - \mathrm{C}$$

Where

C = cash out lay or cost of action

K = Discount rate.

W = Value or worth

A_1, A_2, and A_3…..A_n = Stream of benefit Expected To occur a course of option is adopted.

But the value of the company does not increase itself; there are a number of factors that may contribute to increase the value. The value is represented by the market price of the company's common stock, which in turn reflects the firm's investment strategy, and dividend decisions. So, to maximize of the stock, the financial manager should consider following factors.

Project earning per share

Timing of the earning stream.

Use of debt

Dividend policy

Hence, the wealth maximization principal implies that the fundamental objective of a firm should be to maximize the market value of its shares.

2.2.5 Stock Valuation

Financial managers use different analytical techniques for valuing common stock. The stockholder expects regular earnings in the form of dividends and capital gain by upward movement of the stock price. To maximize the stock price stock valuation model can be used as important tools. Mainly three basic models are used to value stock.

Table 2.1

Stock Valuation Model

S.N	NAVM	Valuation Model
1	NAVM	NW= TA-(CL+LTD)
2	DVM	$P_0 = \sum_{t=1}^{n} \frac{D1}{(1+ke)}$
3	EVM	Po = P/E Ratio *EPS

Source: Rechard pike and Neal

NAVM = Net Assets Value Model

DVM = Dividend Value Model

EVM = Earning Value Model

NW = Net worth

TA = Total Assets

CL = Current Liabilities

LTD = Long Term Debt

P_o = Value of stock Today

D1=Expected Dividend in year 1

K_e= cost of equity

t= 1, 2, 3 ……..n yrs

P/E = Pricing Earning Ratio

EPS= Earnings Per Share

2.2.6 The Expected Rate of Return on Common Stock

The expected rate of return is the increase in the expected after tax value of the initial investment over the holding period. The cash payoff to owners of common stock is of two kinds

- Cash dividend [Dividend component]
- Capital gain (loss) [capital appreciation]

Capital appreciation is the difference between ending value and beginning value of an investment. Returns are defined as the dividend yield plus capital gain/loss. Thus return comes from two sources, income and price appreciation. Return is the main attraction for invests to invest in a risky security as stock (equity share) accepting a varying degree of risk tolerance. "The return from holding an investment over some period, say a year is simply any cash payment

received due to ownership plus the change in market price, derived by the beginning price. From common stock we can define single period return as:

$$\text{Single period return (R)} = \frac{\text{Ending price } (P_t) - \text{Begining Price } (P_{t-1}) + \text{Dividens } (D_t)}{\text{Beginging Price } (P_{t-1})}$$

This formula can be used to determine both actual one period return (when based on historical figure), as well as expected one period return (when based on expected dividend and prices). Also note that the term in parenthesis in the number of above equation represents the capital gain or loss during the year.

Annualized rate of return over several periods can be calculated in two ways. The first one is simply to take the arithmetic average of the annual Holding Period Return (HPR) over a period and the second one, which also takes in to account the compounding effects of cash receipts over different time intervals, is the geometric mean rate of return.

Simple Arithmetic Mean (HPR_{AM}) =

$$\sum_{t=1}^{n} \frac{HPR_t}{n}$$

The Geometric Mean (HPR_{GM}) =

$$\sum_{t=1}^{n} (1 + HPR)^{\frac{1}{n}} - 1$$

Where, HPR_{AM} = Holding Period Return of Arithmetic Mean

HPR_{GM} = Holding Period Return of Geometric Mean

n= Number of periods

2.2.7 Risk on Common Stock

If one is going to invest in common stock, he/she is also going to face some risk for future return. High return on common stock involves high risk and vice-versa.

The risk is defined in Webster's Dictionary as 'a hazard: A peril: exposure to loss or injury, thus for most, risk refers to the chance that some unfavorable event will occur. If you invest in speculative stocks (or, really, any stock), you are taking a risk in the hope of making an appreciable return.

Risk, defined more generally, is a probability the occurrence of unfavorable outcome. But risk has different meaning in different contexts. In our context two measures developed from the probability distribution have been used as initial measures of return and risk. They are the mean and standard deviations of the probability distribution. Some of sources of uncertainty that contribute to risk of investment are cited below.

- **Interest Rate Risk**

Interest rate risk is potential variability of return caused by changes in the market interest rate. If market interest rates rise, then, investments' values and market price will fall and vice versa. The variability of return that results is interest rate risk. This interest rate risk affects the prices of bonds, stock, etc.

- **Purchasing Power Risk**

Purchasing power risk is the variability of return an investor suffers because of inflation. When inflation takes place, financial assets such as cash, stocks, bonds, etc. may lose their ability to command the same amount of real goods and services they did in the past. The real rate of return on financial assets may not adequately compensate the holder of financial assets for inflation.

- **Bull-Bear Market Risk**

When a security index rises fairly consistently from a low point 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.

- **Management Risk**

Though many top executives earn princely salaries, occupy luxurious offices, and wield enormous power within their organizations, they are mortal and capable of making a mistake or a poor decision. Furthermore, errors made by business managers can harm those who invested in their firms. Hence, it also is capable of poring risk to investment.

- **Default Risk**

Default risk is the portion of an investments total risk that results from changes in the financial integrity of the investment. For instance, when a company that issues securities moves further away from bankruptcy or closer to it, these changes in the firm's financial integrity will be reflected in the market price of its securities. The variability of return that investors experience as a result of changes in the creditworthiness of a firm in which they invested is their default risk.

- **Liquidity Risk**

Liquidity risk is the portion of an asset's total variability of return that results from price discounts given or sales commission paid in order to sell the asset without delay. Perfectly liquid assets are highly marketable and suffer no liquidation costs. Illiquid assets are not readily marketable- either price discounts must be given or sales commission must be paid, or both of these costs must be incurred by the seller.

- **Call ability Risk**

Some bonds and preference stocks are issued with a provision that allows the issuer to call them in for repurchase. The portion of a security's total variability of return that derives from the possibility that the issue may be called is the call ability risk.

- **Convertibility RISK**

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

- **Political Risk**

The portion of an asset's total variability of return caused by changes in the political environment that affect the asset's market value.

- **Industry Risk**

An industry is a group of companies that complete with each other to market a homogenous 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

2.2.7.1 The Range

The range is one of the traditional methods of measuring risk, which simply communicates the difference between the best possible returns and the worst possible return; it does not provide information about the distribution of the rates of return between the extremes.

Range=Best possible rate of return-Worst possible rate of return

The degree of risk of an underlying security is reflected in the magnitude of the differences. The smaller the difference the lower will be degree of risk.

2.2.7.2 Standard Deviation

Standard deviation is another parameter of return distribution measurement. It measures the tightness or variability of a set of outcomes. In another word, standard deviation measures the magnitude of the difference between best possible return and worst possible return. Thus, it measures the degree of risk of common stock. Because we have defined risk as the variability of returns,

we can measure risk by examining the tightness of the probability distribution associated with the possible outcomes. In general, the width of a probability distribution indicates the amount of scatter, or variability, of the possible outcomes. Therefore, the higher the probability distribution of expected returns, the less is its variability. Thus, the smaller the risk associated with the investment." The measure we probably use most often is the standard deviation. The symbol for which is σ (pronounced as sigma).

$$\sigma=\sqrt{\Sigma(R-\bar{R})^2(Pi)}$$

where,

Pi=probability,

σ=standard deviation

Thus the standard deviation is a weighted average deviation from the expected value, and it gives an idea of how far above or below expected value and the actual value is likely to be.

2.2.7.3 Systematic Risk and Unsystematic Risk

Systematic risk is the portion of the total risk of an individual security caused by market factors that simultaneously affect the prices of all securities. It cannot be diversified. It is also called market risk or unavoidable risk or non-diversifiable risk or beta risk. It stems from factors, which systematically affect all firms, such as war, inflation, recession, high interest rate, depressions, and long term changes in consumption in the economy.

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

Systematic risk has its source factors that affect all marketable assets and thus cannot be diversified away. The sources of systematic risk are market-pervasive. The measure of systematic risk permits an investor to evaluate an asset's required rate of return relative to the systematic risk of the stock. Unsystematic (company specific/unique) risk can be reduced through diversification. The relationship among total risk, systematic risk and unsystematic risk are shown below:-

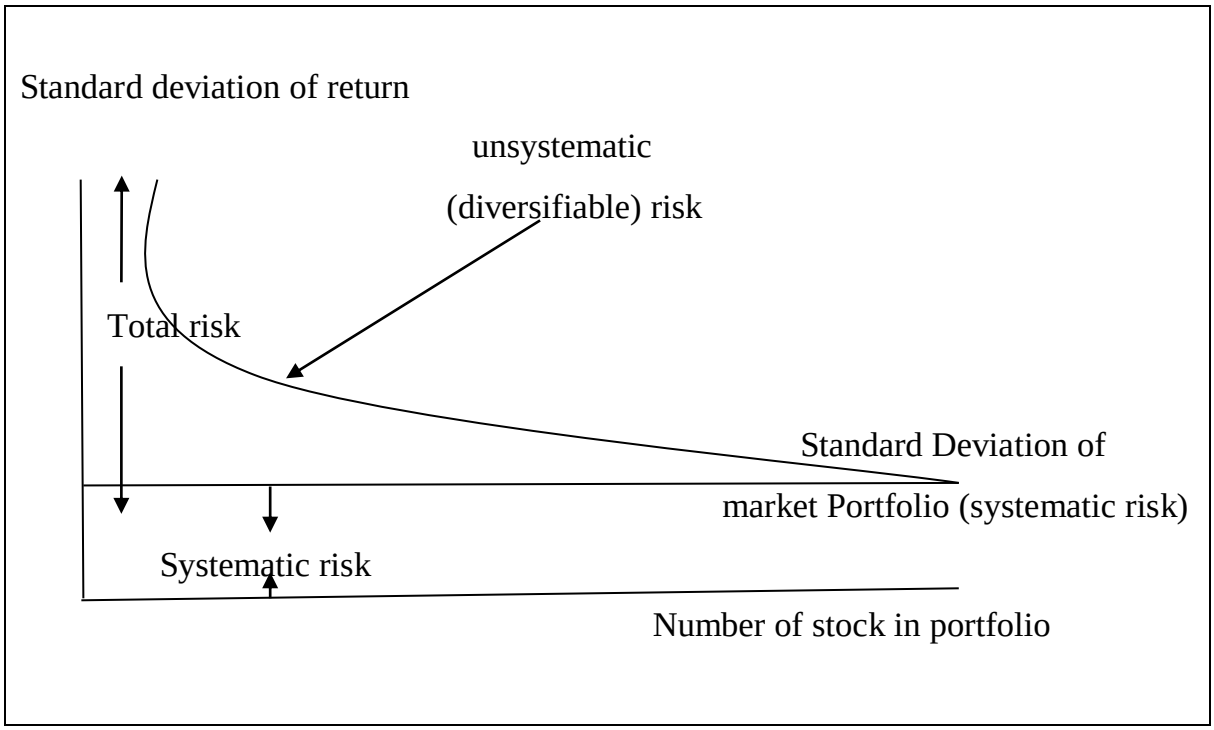
Total risk = Systematic Risk + Unsystematic Risk
or, $\sigma_j = (\sigma_j) \times (P_{jm}) + (\sigma_j)(1-p_{jm})$
or, $\sigma_j = \beta^2 x \text{ Var } (r_m) + \text{Var}(e)$

In this equation P_{jm} is the correlation coefficient between the return of given stock (j) and the return on market portfolio.

The beta coefficient is an index of systematic risk. Betas can be used for a ranking of the systematic risk of assets. An asset with $\beta=1$ is moderate asset because market portfolio and asset's return is equal. An asset with $\beta> 1$ is an aggressive asset because it is more volatile than the market portfolio. If an assets has a $\beta<1$, the asset is defensive asset and the response of the asset will be less than that of the market.

Figure 2.1

Relation Between S.D. of Portfolio and Number of Securities in Portfolio.



Source: jams C. Van Horn: (176)

Systematic risk refers to that portion of total variability in return caused by factors affecting the prices of all securities. Economic, political, and sociological changes are sources of systematic risk. Their effect is to cause prices of nearly all individual common stocks and/or all individual bonds to move together in the same manner.

Systematic risk includes Market risk, Interest rate risk and purchasing power risk. Market risk and interest rate risk can be defined in terms of uncertainties as to the amount of current dollars to be received by an investor's purchasing power risk is the uncertainty of the purchasing power of the amounts to be received. In more, every day terms, purchasing power risk refers to the impact of inflation or deflation on an investment. Unsystematic risk is that portion of total risk that is unique to a firm or industry. Factors such as management

capability, consumer preferences, and labor strikes can cause systematic variability of returns for in a firm.

Unsystematic factors are largely independent of factors affecting securities markets in general. Because these factors affect one firm, they must be examined separately for each company. The uncertainty surrounding the ability of the issuer to make payments on securities seems from two sources: (1) The operating environment of the business, and (2) the financing of the firm. These risks are referred to as business risk and financial risk, respectively. They are strictly a function of the operating conditions of the firm and the way in which it chooses to finance its operations. Our intention here will be directed to the broad aspects and implications of business and financial risk.

2.2.7.4 Portfolio

Conceptually portfolio is a collection of securities that have been gathered to achieve certain investment goals. Investors usually diversify their portfolio in order to minimize their risk given the rate of return. To minimize the risk of portfolio an individual invest in securities with different risk and return characteristics. This procedure is called diversification. The degree of diversification varies depending on how risk avert the investor, is. This Determines the level of risk and return of the portfolio. An efficient portfolio is that portfolio which maximizes return for a given risk or minimizes, risk for a given return. The efficient frontier may be defined as the collection of all possible portfolios that are not dominated or that have the maximum possible expected return, given a level of risk or standard deviation. Portfolio can be classified into.

a. Growth oriented portfolio and
b. Income oriented portfolio.

Growth oriented portfolio is a part portfolio whose primary objective is long-term price appreciation. Income oriented portfolio is a portfolio that stresses current dividends and interest return. There are two types of objectives of portfolio:

Primary Objectives	Secondary Objectives
Maximization of Profit Minimization of risk.	Regular return Stable income. Appreciation of Capital. Ever liquidity. Easy marketability. Tax Benefits.

2.2.8 Capital Assets Pricing Model (CAPM)

CAPM is a model that describes the relationship between risk and expected return. In this model, a security's expected return is the risk free rate plus a premium based on the systematic risk of the security.

Sharpe & Litner developed 'Capital assets pricing Model' (CAPM). This model provides the intellectual basis for a number of the current practices in the investment industry. Although many of these practices are based on various extensions and modifications of the CAPM, a sound understanding of the original version is necessary in order to understand them; CAPM is based on the following assumptions.

- Investors evaluate portfolios by looking at the expected returns and standard deviations of the portfolio over a one-period horizon.
- Investors are risk averse, so when given a choice between two otherwise identical portfolios, they will choose the one with the higher expected return.
- Investors are never satisfied, so when given a choice between two otherwise identical portfolios, they will choose the one with lower standard deviation.
- Individual assets are infinitely divisible meaning that an investor can buy fraction of a share if he or she so desires.

- There is a risk–free rate, at which an investor may either lend (that is invest) money or borrow money.
- Taxes & transactions costs are irrelevant.
- The risk–free rate is the same one period horizon.
- Information is freely and instantly available to all investors
- Investors have 'homogeneous expectation' meaning they have the same

Perception in regard to the expected returns, standard deviations, and Covariance of Securities.

The equation for CAPM is

$$E(r_j) = R_f + [E(r_m) - R_f]\, b_i$$

Where,

$E(r_i)$ = is the expected return for an assets.

R_f = is the risk-free rate (usually assumed to be short term T-bill rate).

$E(r_m)$ = is the expected market return.

βi = is the systematic or market related risk.

It means the sensitivity of a stock's returns. It changes in returns on the market portfolio. The beta of portfolio is simply a weighted average of the individual stock beta in the portfolio.

CAPM model based on the proposition that any stock's required rate of return is equal to the risk-free rate of return plus a risk premium where risk reflects diversification. Remember the relevant risk associated with an individual stock is based on its systematic risk, which depends on how sensitive the firm's operations are to economic events such as interest rate changes and inflationary pressures. Because the general movements in the financial market reflect movement in the economy, the market risk of the stock can be measured by observing its tendency to move with the market, or with an average stock that

has the same characteristics as the market. The measure of the stock's sensitivity to market fluctuations is called its beta coefficient. Beta is a key element of the CAPM.Based on the behavior of the risk averse investor, there is implied an equilibrium relationship between risk and expected return for each security. In market equilibrium, a security will be expected to provide a return commensurate with its unavoidable risk. This is simply the risk that cannot be avoided by diversification. The greater the unavoidable risk of a security, the greater the return that investor will expect from the security. The relationship between expected return and unavoidable risk, and the valuation of securities that follows, is the essence of the capital asset pricing model (CAPM)

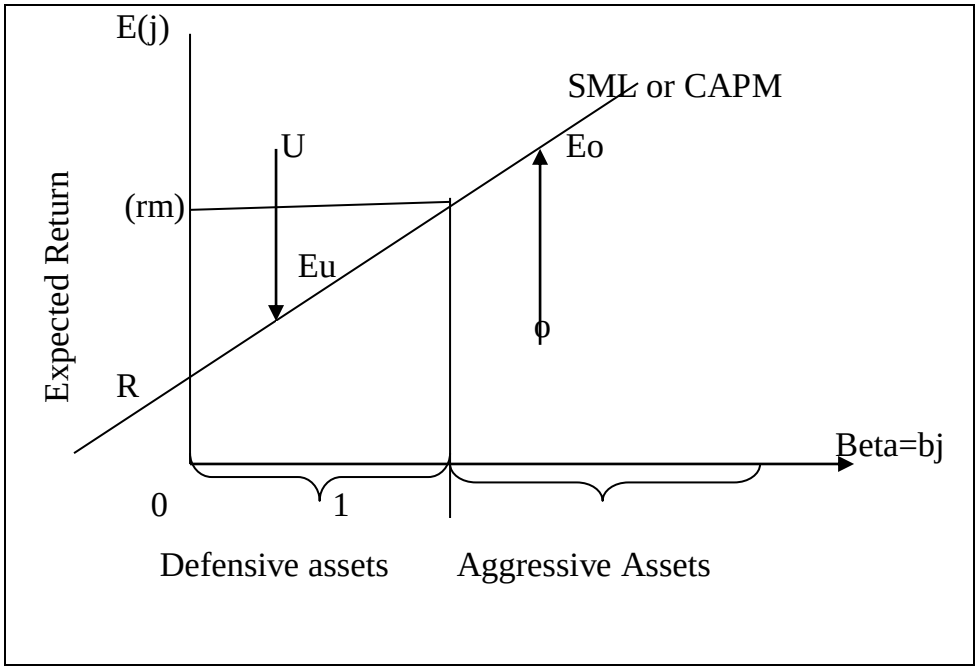
The major implication of the CAPM is that the expected return of an asset will be related to a measure of risk for that asset known as beta (β). The exact manner in which expected return and beta are related is specified by the CAPM. The model provides the intellectual basis for a number of the current practices in the investment industry.

Beta measures undiversifiable risk. Beta shows how the price of a security responds to market forces. In effect, the more responsive the price of a security is to changes in the market, the higher will be its beta. Beta is calculated by relating the returns on a security with the returns for the market.

In summary, CAPM expresses the relationship between an asset’s return and its systematic risk. The relevant risk for an individual asset is systematic risk (or market-related risk) because of non-market can be eliminated by diversification. The CAPM is an equilibrium model for measuring the risk-return trade off for all assets including both inefficient and efficient portfolio.

Figure 2.2

The Capital Assets Pricing Model



Source: Jack Clark Francis

A vertical line in the Figure 2.2 shows a risk class for systematic risk. The CAPM relates an expected return to each of the systematic risk. These expected returns can be interpreted as the appropriate discount rates, as the cost of capital, or as equilibrium rate of return that investors expect for that Amount of systematic risk. In the figure, U and O are not in equilibrium on the CAPM. Asset U is undervalued and therefore desirable to own the asset. The price of U will rise in the market as more investors purchase it. When price goes up of asset U, its return falls. When U's return falls to the return consistent with its beta on the SML, equilibrium is attained. The asset O is overvalued. Investors will attempt to sell O, and therefore puts the 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. Hence, the CAPM or SML is relationship in which the expected rate of return of the individual asset is a linear function of that asset's systematic risk as represented by beta (ß), symbolically. According to Sharpe & Linter (CAPM) study: the greater the beta of a security, the greater the risk

and the greater the expected return required. The lower the beta, the lower will be the risk.

2.2.9 Capital Market Line (CML)

If borrowing and lending opportunities are included in the chart analysis, a linear set of investment opportunities is appeared called capital market line (CML) emerges. It is the locus of the portfolios that wealth seeking risk-averse investors will find more desirable than any other portfolios. CML illustrates the positive relationship between risk and average return. So, it is always be positive sloped because investors are risk averse i.e. sleepless.

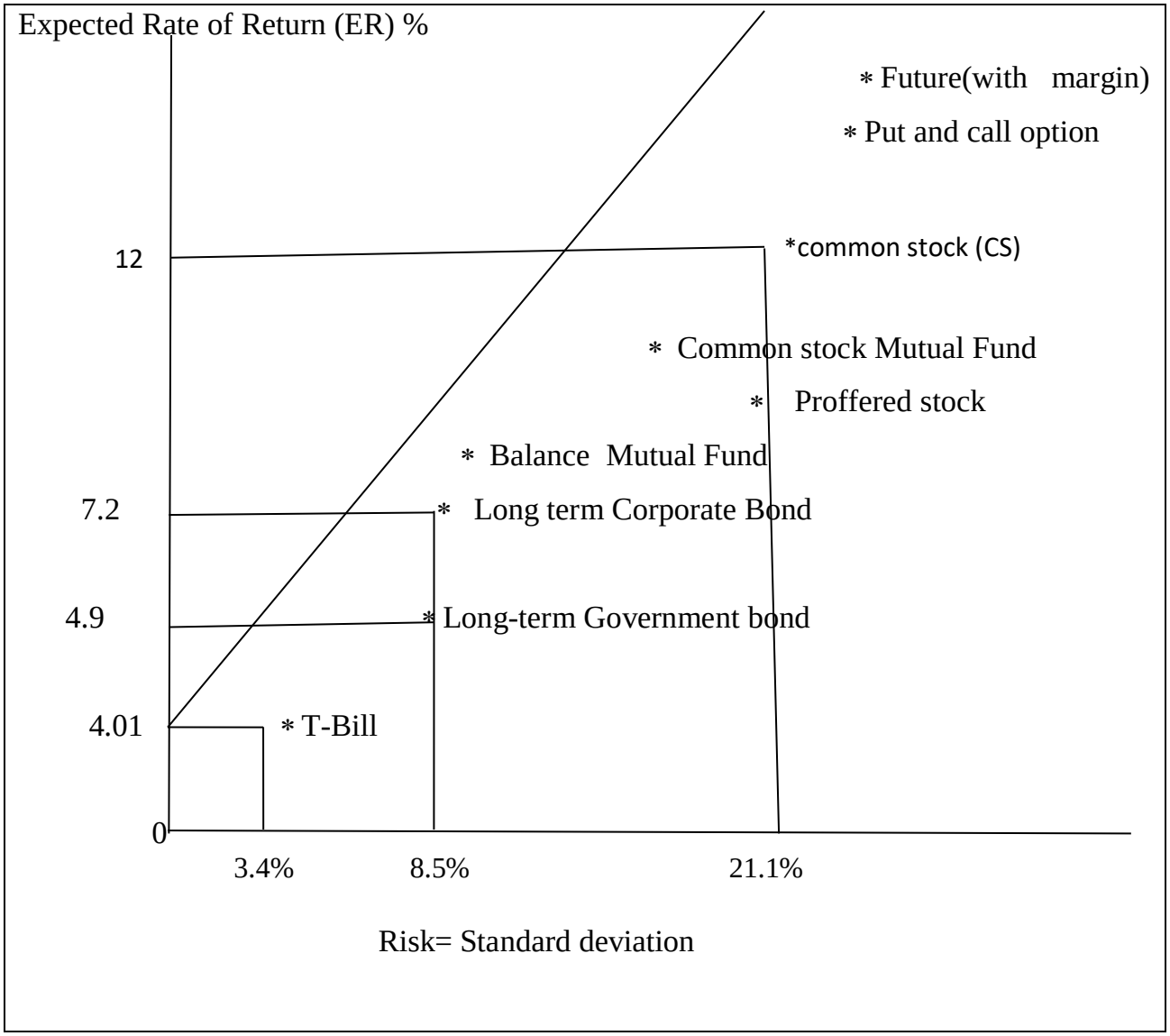
The assumptions underlying capital market theory are as follows:

1. Money can be borrowed and lent at the risk-free rate.
2. All investors have homogenous expectations concerning expected returns and risks on securities.
3. Investments are infinitely divisible.
4. No taxes or transaction costs exist.
5. No inflation exists.
6. Capital markets are in equilibrium.

The main focus of investment graphed in risk-return space which has (1) the maximum expected rate of return in their risk class or (2) the maximum risk at whatever rate of return is selected. The efficient investments are called efficient dual assets are dominated and will not be able to attain the efficient frontier. So, if it is constructed, it will be found convex towards expected rate of return axis in risk rate space. The portfolio having risk reducing power of diversification is needed to reach a positive in risk-return space that is on or near the CML. Only diversified portfolio can attain the CML. The CML is assumed to be the market equilibrium situation and is the locus of the most desirable, or most dominant, investment portfolios. CML concentrates how to form a portfolio that is efficient enough to lay on the CML.

Figure 2.3

The Capital Market Line (CML) and other Investment Opportunities



Source: Jack Clark Francis, P-19

The stars that lie below the CML represent individual stocks, bonds, commodity futures, puts, calls, and other investments. The stars labeled CS, CB,and TB represents the average common stock (CS), corporate bond (CB), and Treasury bill (TB) investments that were shown in the Figure 2.3.

2.3 Portfolio Analysis Among Multiple Assets

The capital-asset pricing model (CAPM) discovered by Sharpe (1964), Linter (1965) and Mossin (1966) is a general equilibrium model. It not only allows

improved understanding of market behavior, but also provides practical benefits. At the same time, it also provides a practical mechanism for evaluating performance in a risk-adjusted mode. This model thus provides the initial basis for the practical implementation of the many aspects of portfolio analysis. However, Richard Roll (1977) has directed some biting criticism at the tests in affirming the CAPM. This criticism is aimed at one of the critical notions "the identifying of the efficient market portfolio". This paper solves the highly difficult problem by a geometrical way. It first denotes the efficient frontier of Markowitz model with the weights vector of portfolio. Then, it denotes the capital market line (CML) with the weights vector too. By the definition of the CML, the efficient market portfolio thus can be identified.

In the path-breaking work on Portfolio Selection, Markowitz (1952) developed the concept of an efficient portfolio in terms of the expected return and standard deviation of return. It analyses the ingenerate relation between the return and risk for portfolio quantification. The Markowitz model is the foundation for portfolio. It make people be able to describe and solve the optimization question of a portfolio by the numbers. The Markowitz model is normative it shows how investors ought to behave. Given that investors behave in the fashion suggested by Markowitz, there are implications for

- The behavior of security prices,
- The sort of risk-return relationship that one would expect, and
- The appropriate measure of risk for securities.

The capital-asset pricing model (CAPM) discovered by Sharp (1964), Linter (1965) and Mossin (1966) is a general equilibrium model that attempts to provide more explicit answers for those implications.

The CAPM not only allows improved understanding of market behavior, but also provides practical benefits. At the same time, it also provides a practical mechanism for evaluating performance in a risk-adjusted mode. This model

thus provides the initial basis for the practical implementation of the many aspects of portfolio analysis. However, Richard Roll (1977) has directed some biting criticism at the tests in affirming the CAPM. This criticism is aimed at one of the critical notions "the concept of a market portfolio".

2.3.1 Efficient Frontier of Markowitz Model

Portfolio construction can be viewed as a matter of selecting securities to include in a portfolio and then determining the appropriate weighting: Proportional representation of the securities in the portfolio. The Markowitz Model indicates that the proper goal of portfolio construction should be to generate a portfolio that provides the highest return at a given level of risk or the Minimum risk at a given level of return. A portfolio having this characteristic is Known as an efficient portfolio and lie in the solution set of the below model.

$$\begin{cases} \text{Min}\sigma_p^2 = X^T \Sigma X \\ \text{Max } E(r_p) = X^T R \\ \sum_{i=1}^{n} \text{Xi} = 1 \end{cases}$$

$R=[R_1, R_2 \ldots\ldots R_n]^T, R_i=E(R_i)$ is expected Rate of return of the i^{th} assets.

$X= [X1, X2 \ldots\ldots\ldots\ldots X_n]^T$ is the Weight Vector of portfolio.

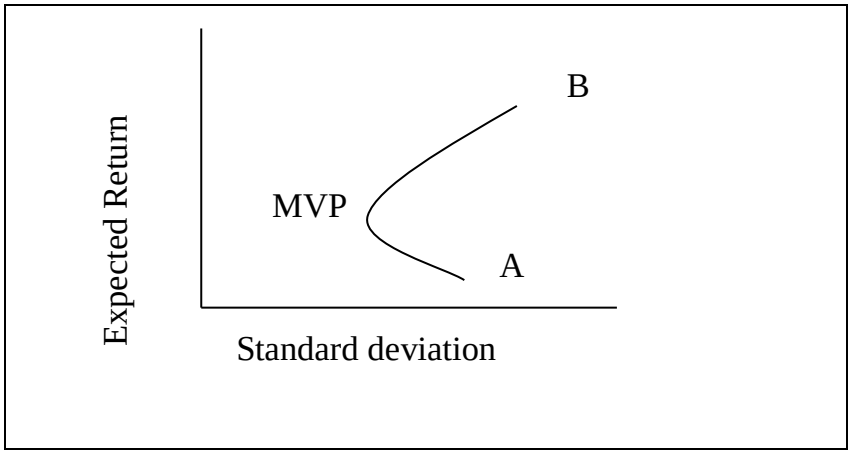
$\Sigma=[\sigma_{ij}]_{n\times n}$ is the Covariance Matrix of nth assets.

$R_p= E(r_p)$ and σ_p^2 are the Expected Rate of return and it's Variance of Portfolio. The σp, which is used to measure the risk of portfolio by Markowitz and Called The standard deviation rate of the return, Express the scope between the rate of return of portfolio r_p and $E(r_p)$.

It common knowledge that the solution of the model (1) is the curve AB in $\overline{\sigma}_p$ r_p space and called Efficient Frontier of portfolio**.**

Figure 2.4

Standard Deviation.



Source: Jack Clark Francis, P-24.

Because of $x_1+ x_2+\Delta +x_n=1$, $x_n=1-x_1- x_2 -\Delta -x_{n-1}$. The Expected Return $R_p=E(r_p)$ and its covariance σ_p^2 of portfolio can be represented:

$R_P=R_1x_1+R_2x_2+\Delta+R_{n-1}x_{n-1}+ (1-x_1-\Delta -x_{n-1}) R_n$…….. (2.1)

$\sigma_p^2=x_1^2\sigma_{11}+x_2^2\sigma_{22}+\Delta+x_{n-1}^2\sigma_{n-1n-1}+(1-x_1-\Delta-x_{n-1})^2\sigma_{nn}+2x_1x_2\sigma_{12}+\Delta 2x_1x_{n-1}\sigma_{1n-1}+2x_1(1-x_1-\Delta-x_{n-1})\sigma 1n+\Delta+2_{n-1}(1-x_1-\Delta-x_{n-1})\sigma_{n-1n}$ …….. (2.2)

The covariance matrix Σ is a definite matrix. So the formula (2.2) stands for an equal variance ellipsoid in the weights-space(x_1, x_2, .x_{n-1}).With regard regard to different σ_p^2, we can get a family of equal-variance ellipsoids that have a concentric MVP. The center MVP expresses the portfolio that has the least risk in the set of feasible portfolios. In the weights-space (x_1, x2….x_{n-1}), the formula (2.1) stands for an equal-expected-return super-plane. With regard to different R_p, we can obtain a family of parallel super-plane. So the optimal weights of the portfolio that includes n assets should be the tangential point between the equal -expected-return super-plane (2.1) and the equal-variance ellipsoid (2.2). Joining these tangential points, we can obtain straight line that is called the critical-line of the portfolio of n^{th} assets. In fact, the critical-line is the manifestation of the efficient frontier in weights-space. Knowing from

differential geometry, the normal vector of the formula (2.1) at point (x_1, x2….x_{n-1}) is:

(R_1-R_n, R_2-R_nΔR_{n-1}-R_n).the normal vector of formula (2.1) at point (x_1, x2Δx_{n-11}) $(\sigma_{11}+\sigma_{nn}-2\sigma_{1n})\,x_1+\Delta\,(\sigma 1k+\sigma_{nn}-\sigma_{1n}-\sigma_{kn})x_k+\Delta$

$+(\sigma_{1n-1}+\sigma_{nn}-\sigma_{1n}-\sigma_{n-1n})\,x_{n-1}+\sigma_{1n}-\sigma_{nn}$

ΔΔΔΔΔΔΔΔΔΔΔΔΔΔΔ

$(\sigma_{1n-n}+\sigma_{nn}-\sigma_{1n}-\sigma_{n-1n})\,x_1+\Delta+(\sigma_{kn-1}+\sigma_{nn}-\sigma_{kn}-\sigma_{n-1n})x_k$

$+\Delta+(\sigma_{n-1n-n}+\sigma_{nn}-2\sigma_{n-1n})\,x_{n-1}+\sigma_{n-1n}-\sigma_{nn}$

Let,

P1=[1 0 0 Δ0 0 -1]

P2=[0 0 0Δ0 0 -1]

ΔΔΔΔΔΔΔΔΔΔΔΔ

Pn-1 = [0 0 0Δ0 1 -1]

$$Q=\begin{pmatrix} 1 & 0\,\Delta & 0 & 0 \\ 0 & 1\,\Delta & 0 & 0 \\ M & M & 0 & M & M \\ 0 & 0\,\Delta & 1 & 0 \\ -1 & -1\,\Delta & -1 & 1 \end{pmatrix} \quad W=\begin{pmatrix} X_1 \\ X_2 \\ M \\ X_{n-1} \\ 1 \end{pmatrix}$$

Then normal vector of formula (2.1) at point x_1,x_2…x_{n-1}) can be simplified to (p_1ΣQW,P_2 ΣQWΔ P_K ΣQW Δ P_{N-1} ΣQW) According to the definition of the critical line, we can obtain the equation of the critical line (i.e. the efficient frontier of the Markowitz model) that is

$$\frac{P_1\Sigma QW}{(R_1-R_n)} = \frac{P_2\Sigma QW}{(R_2-R_n)} = \Delta = \frac{P_k\Sigma QW}{(R_k-R_n)} = \Delta = \frac{(P_{n-1}\Sigma QW)}{(R_{n-1}-Rn)} \quad \ldots\ldots\ldots\ldots\ldots\ldots(2.3)$$

By the formula (2.3) we can obtain the linear equation grouped that is composed of n-1 linear equation.

$$\begin{cases} a_{11}x_1+a_{12}x_2\Delta a_{1n-n}x_{n-1}=b_1 \\ a_{21}x_1+a_{22}x_2+\Delta+a_{2n-1}x_{n-1}=b_1 \\ \Delta\Delta\Delta\Delta\Delta\Delta\Delta\Delta\Delta\Delta\Delta\Delta\Delta \\ a_{n-2},\ x_1+a_{n-2}x_2+\Delta+a_{n-2n-1}x_{n-1}=b_{n-2}\ldots\ldots\ldots..(2.4) \\ \text{Here,} \end{cases}$$

$$a_{ij}=\frac{\sigma_{ij}+\sigma_{nn}-\sigma_{in}-\sigma_{jm}}{R_i-R_n}-\frac{\sigma_{i,n-1}+\sigma_{nn}-\sigma_{jn}-\sigma_{n-1,n}}{R_{n-1}-R_n}$$

$b_i = \frac{\sigma_{in}+\sigma_{nn}}{R_i - R_n} + \frac{\sigma_{n-1,n}-\sigma_{nn}}{R_{n-1}-R_n}$ $(i = 1,2\Delta n-2, j = 1,2\Delta n-1)$

2.3.2 Capital Market Line (CML) and the Market Portfolio

The CAPM is usually derived on the assumption that there exists a risk less asset available for investment. It is further assumed that investor can borrow or lend as much as desired at risk-free rate. Given this opportunity, investors can then mix risk-free assets with a portfolio of risky assets M to obtain the desired risk-return combination. Let W represents the proportion invested in risk-free assets and 1-W the proportion invested in the risk assets, we can use a formula to calculate the expected return on the combination of portfolio R_P :

$R_p = E(r_p) = W_{rf} + (1-W)\, E(rm) = W_r + (1-W)\, R_M$ ..... (3.1)

The variance of the portfolio is:

$\sigma_p^2 = W^2\sigma_p^2 + (1-W)^2\sigma_m^2 + 2W(1-W)\, p\sigma_f\sigma_M = (1-W)^{2\sigma M^2}$ ..... (3.2)

So,

$\sigma_p = (1-W)\,\sigma_M$ ..... (3.3)

Taking the formula (3.3) into formula (3.1), we get:

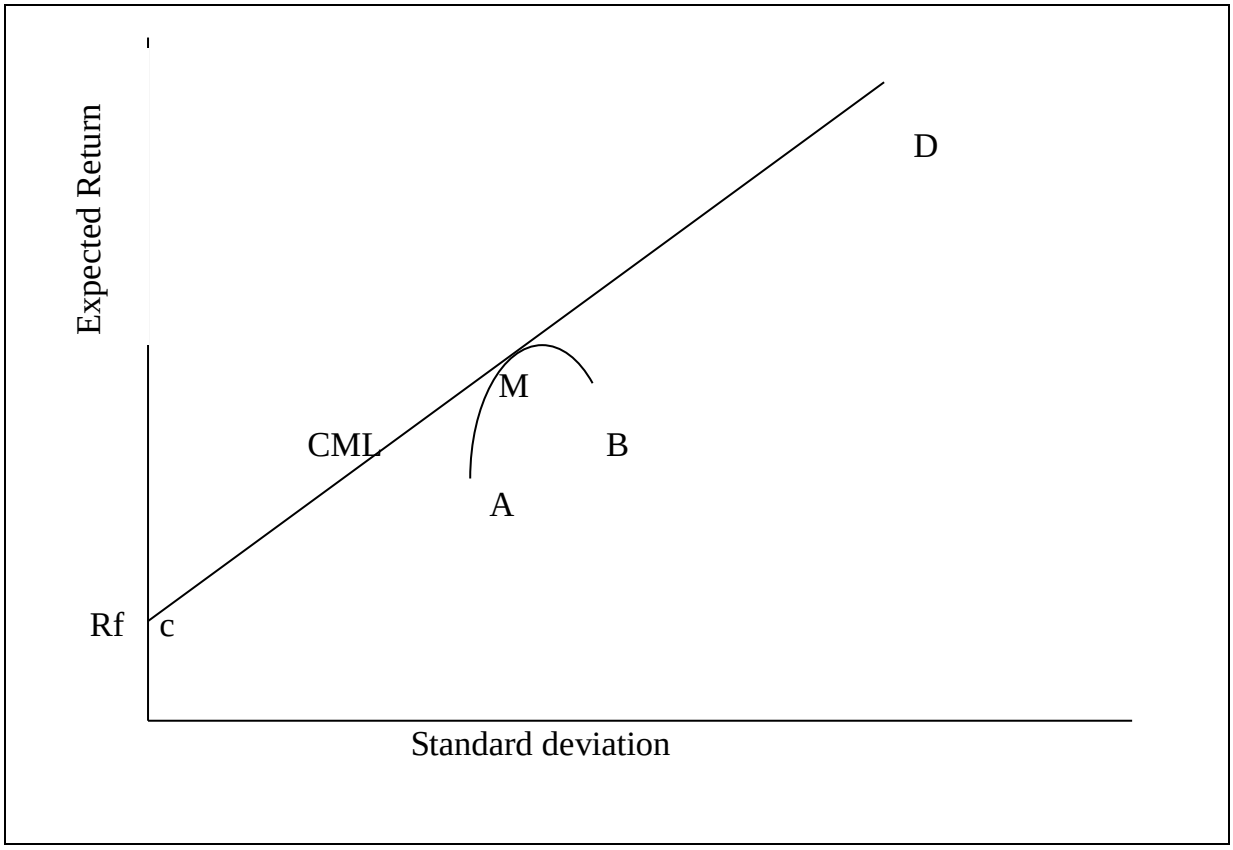
$R_p = rf + \frac{rm-rf}{\sigma m}\sigma p$ ..... (3.4)

This is the capital market line (CML).

The possibility of lending and borrowing changes the original efficient frontier AMB to the straight line CMD, as shown in Figure 2.5. This line, rising from the interest rate point C on the vertical axis and tangential to the curve at point M, sets out all the alternative combinations of the risky portfolio M with risk-free borrowing and lending. The portfolio M is called the efficient portfolio, it is an efficient portfolio.

Figure 2.5

Efficient Portfolio



Source: Sharpe, William F., Alexander, Gordon J. & Bailey, Jeffery V.

Changing the formula (3.4) into:

$R_p=r_f+k\sigma P$..... (3.5

We can then obtain:

$\sigma_p^2 = 1/k_2 (R_p^2-2R_pR_f+R_f^2)$ ……. (3.6)

Taking $R_p = X^TR$ and $\sigma_p^2=X^T\sum X$ into the formula (3.6), we can get:

$X^T\sum X= 1/k_2 [R_{f2}-2r_fX^TR+(X^TR)^2]$……..(3.7)

The rank of the linear equations group (2.4) is n-2, so the number of its basic set of solutions is 1. That is saying that x_2, x_3, ^ x_{n-1} can all be expressed by x_1. Knowing from the formula (2.5), therefore, x can be expressed by x_1 too. Taking x_1, x_2, and x_3 into the formula (3.6), we get a quadratic equation with one unknown concerning x_1. The point M is a tangential point, so x_1 has only one root. According to the extract roots formula, we can find the values of x_1

and k. Then we can get naturally the value of x_2, x_3, ^ x_n. By the value of k, we can also get the equation of the capital market line (CML). According to the following

Formulas:

$R_p = X^T R$……. (3.7)

$\sigma_P^2 = X^T \sum X$……. (3.8)

We can obtain the expected return R_M and the variance σ_M^2 of the efficient market portfolio respectively.

2.4 Review of Previous Studies

During the 1950s and 1960s, Harry Markowitz, James Tobin, Jack Treynor, Bill Sharpe, and other showed that rational investors should ignore the investment characteristics of individual assets and focus instead on diversified portfolio. They proved that portfolios are more desirable than individual assets because portfolios can benefit from the risk-reducing power of diversification that individual assets cannot obtain. Researchers went on to demonstrate that once portfolios are investment of choice, the individual assets need only be analyzed to find out their expected rate of return and what risk they might contribute to diversified portfolio. One eye-opening implication of this analysis is that undiversifiable risk should not play a role in the determination of security prices.

2.4.1 Foreign Context

In the year 1967 in his article stated that a number of investigators have considered the question of the utility of the Markowitz procedures in a normative role. Given some method of security analysis and some rule for portfolio selection, does the Markowitz approach provide portfolios that outperform those selected in other ways? This is, of course, an empirical question; and all the usual problems associated with such questions arise. What is the appropriate test of performance? Are the methods reproducible in the future? And, if the test shows the Markowitz technique to be inferior,

doesn't this simply suggest that the security analysis method utilized was poor? The majority of the tests performed to date have utilized was past performance to derive (probabilistic) estimates of future performance. The alternative is usually a randomly-selected portfolio or the actual performance of a mutual fund. Surprisingly, even under these conditions, the Markowitz approach appears to stand up well. The evidence, although limited, is thus comforting to the theory's proponents.

In 1985 Gordon A. Alexander and Bruce G. Resnick had focused for the risk-averse investors, consideration of estimation of risk is important in selecting an expected-utility-portfolio. They have examined the tangency of portfolio by using Market Model to estimate the risk and drawn the conclusion that "In the presence of a risk-free asset, the efficient frontier is known to consist of linear combinations of risk-free asset and tangency portfolio. If the Full Covariance Model is used, it has been shown elsewhere that the composition of the tangency portfolio when estimation risk is recognized identically to its composition when estimation risk is ignored. It may be used as originally presented since there is little substantive difference in the tangency portfolio's composition when estimation risk is recognized relative to when it is ignored. Of course, it should be kept in mind that the location of the efficient frontier will shift, even though the tangency portfolio's composition is unaffected, when estimation risk is recognized. This means that the expected-utility-maximizing, risk-averse investor will generally invest more in the risk-free asset and less in the tangency portfolio when estimation risk is recognized relative to when it is ignored.

In the year 1988, Graham D. I. Barr and David J. Bardfield investigated the on the small scale random section of 30 shares from Mining and Industrial sectors on Johannesberg Stock Exchange from January 4, 1974 to January 4,1985 and have demonstrated a technique for estimating portfolio weights. The method does not rely on historical returns for its expected return input but uses

expected returns generated by the CAPM. This plausible and flexible method can be used to estimate optimal efficient portfolio weights for a range of prior expectations on overall market performance. Thus this technique can be sued for estimation of portfolio weights under various proposed bull and bear market scenarios.

In the year 2004, Elyas Elyasiani has used the Multivariate Generalized Autoregressive Conditionally Heteroskedastic (GARCH) method by taking daily data from January 4, 1988 to December 29, 2000 and data are sorted into three portfolios – the Money Centre Bank, the Large Bank and the Small Bank portfolios and drawn the conclusion as "The study examines the effect of interest rate volatility on bank stock returns and risk. Volatility in financial markets is generally overlooked in bank asset pricing models as a factor influencing bank stock returns and/or stock volatility. However, according to the results reached volatilities, as measured by volatilities of the short-term and long-term interest rates, do play a considerable role in determining the distribution of the bank stock returns, with the direction of the effect being model dependent. Specifically, fluctuations in the long-term interest rate volatility are found to increase bank stock return volatility. Hence, the use of a misspecified model may subject the direction and the magnitude of the interest rate effect to error and may misguide investors in bank stocks, as well as bank managers and policy makers. The overall results seem to be more plausible in the second model which uses the long-term interest rate level as an argument in the mean return equation. Determination of the appropriate interest rate in the bank asset pricing model through a formal model selection procedure is a logical next step in addressing the issues of concern.

In year 2004 Peter Byrne and Stephen Lee had different tools and techniques such as mean-variance model, mean absolute deviation approach, lower partial movement and minimax model in their research and concluded that "Traditionally, the measure of risk used in portfolio optimization models is the

variance. However, alternative measures of risk have many theoretical and practical advantages and it is peculiar therefore that they are not used more frequently. This may be because of the difficulty in deciding which measure of risk is best and any attempt to compare different risk measures may be a futile exercise until a common risk measure can be identified. To overcome this, another approach is considered, comparing the portfolio holdings produced by different risk measures, rather than the risk return trade-off. In this way we can see whether the risk measures used produce asset allocations that are essentially the same or very different. The results indicate that the portfolio compositions produced by different risk measures vary quite markedly from measure to measure. These findings have a practical consequence for the investor or fund manager because they suggest that the choice of model depends very much on the individual's attitude to risk rather than any theoretical and/or practical advantages of one model over another.

2.4.2 Nepalese Context

Pradhan(1993) carried out a study on the topic of "Stock market behavior on a small capital market a case in Nepal" in 1993. The study was based on the data collected for seventeen enterprises from 1983 through 1990. One of the major objectives which are related to this study was "To access the stock market behavior in Nepal" Pradhan summarized the following findings Dividend per share and market price per share was positively correlated. Higher the earning on stocks, larger the ratio of dividends per share to market price per share. There are positive relationship between dividend payout and liquidity. Shrestha (2004) carried out the study on "Shareholders Democracy and annual general meeting (AGM) feedback". This study critically analyzed the situation of common stock investors and the situation is not improved significantly till now. Though the size of the shareholders population in Nepal has been growing constantly the government seems to have not taken any initiation in formulating the separate Act which protects the shareholders right.

Company and other acts relating to financial and industrial sector have provisioned rights of the shareholders as: -

- Voting right
- Participation in general meeting
- Right of getting information
- Electing as BOD
- Participation in the profit and loss of company.
- Transferring shares.
- Proxy representation.
- Collective rights of shareholders are:
- Amend the internal bylaws.
- Authorize the sales of assets
- Enter into merges Change the amount of authorized capital.

Some public limited companies have floated the shares of the general public without having shareholders representation in the board. There are many such companies, which conduct the annual general meetings just to fulfill their desire and do not consider the voice of the shareholders.

Shrestha (2004), argued further to safeguard the investors interest: "The encouraging and growing confidence of shareholders over their investment seek an independent inquiry of disclosed contents of prospectus. This helps to satisfy a minimum standard of faith on investment in shares through relying on pros and cons of prospectus. It is therefore, important to dispose everything in prospectus, which could reasonably influence the mind of the prudent investors.

Various annual general meetings held by different public limited companies reveal a greater gap between disclosure made in prospectus and the actual results, which were reported. In this context the expression of disclosures

philosophy and investigation of frauds in prospectus need to be reconciled to check and growing problems in the development of the capital market in Nepal. Paudel (2007), has carried out study about "Investing in shares of commercial Banks in Nepal: An assessment of return and risk elements." To analyze the risk characteristics of the shares of joint venture commercial banks, the share prices of Nepal Arab Bank Ltd.(NABIL), Nepal Indosuez Bank Ltd. (NIBL), Standard Chartered Bank Ltd. (SCBNL), Himalayan Bank Ltd. (HBL), Nepal SBI Bank Ltd. (NSBL), Nepal Bangladesh Bank Ltd.(NBBL), Everest Bank Ltd. (EBL) and Bank of Katmandu Ltd. (BOKL) have been analyzed. Six years data are analyzed. His findings are summarized as below:

Bank	**Price**	**K_{avg}**	**K**
Nepal Arab Bank Ltd.	Over-priced	5.9	6.18
Nepal Indosuez Bank Ltd.	Over-priced	5.79	5.9
Standard Chartered Bank Ltd	Under-priced	7.06	5.72
Himalayan Bank Ltd.	Over-priced	5.52	6.00
Nepal SBI Bank Ltd.	Under-priced	8.56	5.82
Nepal Bangladesh Bank Ltd	Under-priced	14.24	5.81
Everest Bank Ltd	Under-priced	13.09	5.75
Bank of Kathmandu Ltd.	Under-priced	15.57	5

Where,

K avg= Average mean return

K = The required rate of return using CAPM (Capital Assets Pricing Model).

It shows with larger standard deviations seem to be able to produce higher rate of return. The portion of unsystematic risk is very high with the shares having negative beta co-efficient. The risk per unit of return, as measured by beta co-efficient of variation, is less than that of the market as a whole for all the individual shares. Most of the shares fall under the category of defensive stocks (having beta co-efficient less than 1), except the shares of Bank of Kathmandu Ltd. Return on the shares of Nepal Arab Bank Ltd. Is negatively

co-related with the return on the market portfolio and, therefore, it has negative beta co-efficient. From the analysis it appears that none of the shares are correctly priced.

Theoretically, the market price of an overpriced shares (under-priced) will fall (rise) in order to increase the expected return such that the expected return equals the required return. Therefore, shares of Nepal Arab Bank Ltd., Nepal Indosuez Bank Ltd. and Himalayan Bank Ltd. which are overpriced relative to equilibrium thus market focus, will decline. The remaining shares appear to be under-priced indicating a possible positive long-term price trend.

2.4.3 Review of Master's Thesis

Gupta Surendra.p (2010), finds through "Risk and return analysis of common stock investment of listed commercial bank,with reference to NABIL,HBL and EBL(2010), Gupta Surendra p (2010), Finds and conclude that investment of banking sector is also not well and return is not well as per risk. Gupta Surendra.p (2010), suggest that HBL should change his investment policy and try to minimize risk.

pradhan (2009), conducted His Study "Investment and liquidity management of insurance company in Nepal (2009)" (pradhan, Ujina (2009) finds

- The area of investment of insurance is found much tapered likes all eggs are in same basket.
- The insurance companies are being disabled to explore the area of investment in high income generation sector like short term investment, debenture of other company except NICL
- The insurance companies seems not wanting to make a risk in their investment
- The trend of future earning of most of the insurance companies is found not satisfactory except UICNL and EICL.
- The total correlation coefficient is found positively as well as negatively

Bhandari (2006),conducted the study on "*Risk Return analysis in common stock Investment of listed companies in Nepal"*(2006), out of the objective, "risk return of common stock and their portfolio in a simple way and to study volatility" is related with this study.

Bhandari finding was that expected return on the common stock of Nepal Finance and Saving Co. Ltd. is highest (i.e. 91.56%). Bhandari study was related with various types of organizations but results derived some relevant organizations are as below:

Bank	**Expected Return**	**Standard Deviation**	**Co-efficient of Variation**
HBL	58.64%	0.7112	1.213
SCBNL	57.84%	0.7201	1.245

Adhikari (2001), conducted the study on common stock investment by using nine years data year from 1992/1993 to 2000/2001. There were various objectives of the study; among them one "to evaluate common stock of listed commercial banks in terms of risk and return and to perform sector wise comparison on the basis of market capitalization" is related to this study. Expected return of HBL is minimum (i.e. 13.3%) only HBL's expected rate of return is lower than market return (i.e. 13.3 %< 23.85%). The risks C.V of SCBNL has 0.9689 risks per 1% return but HBL has highest risk 1% of return (i.e. 2.9261). Market beta of Bank of Kathmandu ltd. is most volatile (i.e β.=1.9656) and SCBNL's CS is least volatile (i.e. β = 0.2218). All banks common stocks are under-priced.

Bhattarai (2008), Finds on the basis of analysis of portfolio, standard deviation, and coefficient variance the formation of portfolio with the stock of NABIL with 20%, SCBNL with 40% and NSBIBL with 20% investment proved to be optimum investment in an industry whereas 20% NABIL, 40% CIT and 40% PICL proved to be the even better investment portfolio because of spread

across industries and the stock being negative correlated Bhattarai (2008), argue that the situation of negatively correlated is very hard to find.

Pokhrel (2008), conducted the study on Portfolio analysis on common stock of Joint venture Banks in Nepal, (2008) by using nine years data year from 1999/2000 to 2007/2008. He has conducted the study of all the Joint Venture banks that are NABIL, SCBNL, HBL, SBI, NBBL, and EBL. There were various objectives of the study; among them one "to estimate the optimal portfolio among CS investment of JVBs" is related to this study. In his study all the CS of JVBs are underpriced. Correlation between HBL and EBL was found to have 1, there is no chance to minimize risk by creating portfolio of HBL and EBL so excluding the EBL, he has estimated the optimal portfolio among the remaining five JBVs whose return was 88.2% and the risk underlying on it was 102.3% with the investing weight as:

Bank	Weight
NABIL 45.33%	45.33 %
SCBNL 38.13%	38.13 %
HBL -7.11%	-7.11 %
SBI 49.57%	49.57 %
NBBL	-25.92 %

Review of Ph.D. research by Post Doctoral researcher of CCER, Peking University, and People Republic of China. In this research paper a mathematical/Algorithm model for the optimal portfolio is designed. It gives a new thought to gain the capital market line (CML). Although the problem of the identifying the market portfolio has puzzled the academia for more than twenty years using the way that this paper afford can solve the conundrum. More detail is explained later.

2.4.4 Research Gap

Research work conducted prior to this work could not estimate the portfolio among the multiple assets (CS), the primary aim of this research work to project/estimate an optimal portfolio among multiple assets.

CHAPTER-III
RESEARCH METHODOLOGY

This chapter refers to the overall approach to the research process, from the theoretical underpinning to the collection and analysis of data. As most of the data are quantitative, the research is based on scientific methods. It is composed of both part of technical aspect and logical aspect. On the basis of historical data, using both financial and statistical tools performs detail analysis of different variables. Results are presented in simple way. Detail research methods are described in following headings.

3.1 Research Design

The research is based on recent historical data that are collected from secondary sources. It covers ten years period from F/Y 2003/04 to F/Y 200/09 A.D. It deals with the study of risk, return and portfolio analysis of insurance companies on the basis of available information. As the title of the research suggests, it is more analytical, empirical and less descriptive.

Analytical in the sense that the available data are analyzed by using various statistical tools and techniques such as standard deviation, co-efficient of variation, regression model etc.

3.2 Population and Sample

As on Mid July 2009, there are more than 20 Insurance Companies that are listed in NEPSE and out of them there are 5 insurance companies are taken as sample which is 38.46% of population. This 5 sample are taken due to easily available and reliable data and high valuation of transaction.

3.3 Data Collection Techniques

The data are collected from secondary sources in a convenience sampling method. Informal discussions were conducted with individual investors,

SEBO/N and NEPSE staffs and stockholders. Official website of NEPSE "http://www.nepalstock.com" and Nepal Rastra Bank "http://www.nrb.org.np" are accessed for data. Stock price of the different stocks publications of NEPSE and published financial statements are used as sources of secondary data. NEPSE indices have been collected from NEPSE office and web site as well. Financial statements of different insurance companies and their annual financial reports have been collected from respective insurance companies. NEPSE periodicals, articles and previous research have also been considered.

3.4 Data Analysis Tools

Market Price of Stock (P)

Among the various major data of the study, market price of stock is the most important. There are three-price records available, namely high price, low price and closing price of each year. Therefore two approaches either average price (i.e. average of high and low price) or closing price can be used.

By using average price, result may be very close to reality as it represents the price of whole year, but it is very difficult to obtain the real average. To get the real average, volume and price of each transaction in the stock and duration of time of each transaction in the whole year are essential. So, it is, of course, very hard and difficult together and includes all these information and average of high and low price cannot be used for this study. Due to such difficulties, it is very difficult to use average price as market price of stock, which has a specific time span of one year and the study has focused in annual basis.

Dividend (D)

Company pays dividend to its existed shareholders in case of the declaration of only cash dividend, it is easy to calculate dividend amount. In case of the declaration of stock dividend (i.e. bonus shares) it is difficult to obtain the amount that really a shareholder has gained. In such condition, shareholders get additional number of shares as dividend and simultaneously price of stock

declines, as a result of increased number of outstanding stocks. So, to get the real amount of dividend, there is no model or formula developed yet.

In this study, models have been developed considering practical and theoretical aspect as well.

In case of stock dividend;

Total dividend amount = Cash Dividend + Stock Dividend % x Next years MPS

where, MPS = Market Price Per share

Return on common stock investment (R):

Return is the income received in an investment plus any change in market price, usually expressed as a percent of the beginning market price of the investment.

Symbolically

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

Where;

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

D_t= Cash Dividend received at time t.

P_t= Price of stock at time t.

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

Expected Return of Common Stock E(R_j)

One of the main aims of the study is to determine the expected return on the investment in common stock. Generally, this rate is obtained by arithmetic mean of the past year's return.

Symbolically,

$$E(Rj) = \bar{R}j = \frac{\Sigma Rj}{n}$$

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

N= Number of years that the return is taken.

Σ= Sign of summation.

Standard Deviation (σ)

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

Symbolically

$$\boldsymbol{\sigma j = \sqrt{\frac{\Sigma(Rj - \bar{R}j)^2}{N-1}}}$$

Where,

σj= Standard deviation of returns on stock j during the time period n.

Co-efficient of variation (C.V.)

It is the ratio of standard deviation of returns to the mean of that distribution. It is a measure of relative risk.

Symbolically

$$C.V = \frac{\sigma j}{Rj}$$

Beta (β):

It is an index of systematic risk. It measures the sensitivity of a stock's return on the market portfolio.

$$B_j = \frac{COV\ (R_j, R_m)}{\sigma_{m^2}}$$

Where

βj= Beta co-efficient of stock J.

$$COV\ (R_j, R_m) = \frac{\Sigma(Rj - \bar{R}j)(Rm - \bar{R}m)}{N}$$

σ_m^2= Variance of market return.

Correlation Co-efficient (Pij) The correlation is also a measure of the relationship between two assets. The correlation co-efficient can taken on a value ranging from -1 to +1. Correlation and covariance are related by the following equation.

$$COV_{ij} = \sigma_i \sigma_j P_{ij}$$

$$\therefore Pij = \frac{COVij}{\sigma i \sigma j}$$

Where:

σ_i and σ_j are standard deviations of returns for assets i and j and P_{ij} is the correlation co-efficient for assets i and j.

There are various cases of correlation and risk condition, which are presented as below:

Perfect Positive Correlation (P_{ij}=+1)

Returns on two perfectly correlated stocks would move in direct proportional and a portfolio consisting of two such stocks would be exactly as risky as the individual stocks. Thus diversification does nothing to reduce risk if the portfolio consists of perfectly positively correlated stock.

Perfect Negative Correlation (P_{ij}=-1)

Returns on two perfectly correlated stocks would move perfectly together but in exactly opposite direction. In this condition, risk can be completely eliminated. Perfect negative correlation almost never found in the real world.

No Relationship between Returns (P_{ij}= 0)

When the correlation between two stocks is exactly zero, there is no relationship between the returns; they are independent of each other. In this condition, some risk can be reduced.

Intermediate risk (P_{ij}= + 0.5)

Most stocks are positively correlated, but not perfectly. On average the returns on two stocks would lie on the range of +0.4 and +0.75 under this condition combining stocks into portfolio reduces risk but does not eliminated completely.

Portfolio Returns (Rp)

Portfolio is combination of two or more securities or assets and portfolio return is simply a weighted average of individual stock returns.

In case of two assets case:

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

In case of three assets case:

$\bar{R}_p = \bar{R}_A W_A + \bar{R}_B W_B + \bar{R}_C W_C$

Where,

$\bar{R}_p$ = Expected return on portfolio of stocks

W_A, W_B, W_C are weight of stock A, B and C respectively.

$W_A + W_B + W_C = 1$ (or 100%) always.

Portfolio Risk (σp)

It is measured by the combined standard deviation of the standard deviations of individual stock returns.

In case of two assets case:

$$\sigma_P = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2W_A W_B \, COV(R_A, R_B)}$$

In case of three assets case:

$$\sigma_P = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + W_C^2 \sigma_C^2 + 2W_A W_B \, COV(R_A, R_B) + 2W_B W_C \, COV(R_B, R_C) + 2W_C W_A COV(R_C, R_A)}$$

Where,

Σp = Standard deviation of portfolio return of stock A, B and C

$Cov(R_A, R_B)$ = Equivalent representation for covariance of returns between assets A & B

Risk Minimizing Portfolio

It is the ratio of two assets, which minimize the risk (σp)

Symbolically,

$$WA = \frac{\sigma_{B^2} - COV\,(R_A, R_B)}{\sigma_{A^2} + \sigma_{B^2} - 2cov\,(R_A, R_B)}$$

Where,

W = Weight of Stock A that minimize the portfolio risk of stock A & B.

σ_A^2 = Standard Deviation of stock A

σ_B^2 = Standard Deviation of stock B.

Systematic Risk

Systematic risk refers to that portion of total variability in return caused by factors affecting the prices of all securities. Systematic risk is external to an industry and, of business and is attributed to board forces out of the business. Unlike systematic risk it is the risk that can be diversified away. Due to this character of this risk it is said to be relevant risk to be concerned. We can sort out systematic risk out of total risk using tool below:

Total risk	=	Systematic risk + Unsystematic risk
σ_j^2	=	$B_j^2\sigma_m^2+\sigma_e^2$

$$Portion\ of\ systematic\ risk\ = \frac{Systematic\ Risk}{Total\ Total\ Risk} = \frac{\beta_j{}^2\sigma_m{}^2}{\sigma_m{}^2}$$

Where,

σ_j^2 = Variance of stock J.

β_j^2 = Square of beta to of stock j.

σ_m^2 = Variance of Market.

Portion of Unsystematic risk will simply be (1-Portion of systematic risk)

$$\text{or}\quad 1 - \frac{\beta j^2 \sigma m^2}{\sigma j^2}$$

In case of multi Assets

Portfolio return (Rp) = $r_f + K\sigma_p$

Portfolio risk (σ_p) = $\frac{1}{k}$ ($R_p2 - 2R_Prf + rf^2$) k should be calculated solving

CHAPTER- IV
PRESENTATION AND DATA ANALYSIS

This chapter is the major part of the study and holds the main important place in the entire research. This chapter deals with analysis of data collected and their presentation with interpretation using different tools and techniques of analysis. In this chapter effort has been made to analyze risk return and portfolio behavior of Insurance companies of Nepal. The analysis of data consists of organizing, tabulating and assessing financial and statistical result. Tables and diagrams are listed to make the result more simple and understandable with reference to the various readings and review of literature.

4.1 Data Analysis of Individual Companies

As per Annual Report 2008/009 of Securities Board, Nepal there are altogether 20 insurance companies that are listed in NEPSE. Since the study is concentrated on the common stock of the Insurance companies, analyses are done separately.

4.1.1 Himalayan General Insurance Co. Ltd

4.1.1.1 Introduction

Himalayan General Insurance Co. Ltd. was incorporated in the year 1988 A.D. with authorized capital of Rs. 80000000.00 and 1882 shareholders. This company was listed in the 1994 in NEPSE. This company has issued capital of Rs. 30000000.00 and has paid-up capital of Rs. 30000000.00 with paid up per share of Rs. 100. In summary

Authorized Capital : Rs. 80000000.00

Paid-up Capital : Rs. 100800000

Issued Capital : Rs. 30000000.00

Par value of shares : Rs. 100

Number of shareholder/s : 1359

4.1.1.2 Data

Market price and dividend records of common stock of Himalayan General Insurance Co. Ltd. are shown in Table 4.1. Closing MPS of Himalayan General Insurance is found to be high in the year 2007/008.Year-end price movement and annual dividends paid to shareholders of Himalayan General Insurance Co. Ltd. are also shown in the same Table 4.1.

Table 4.1

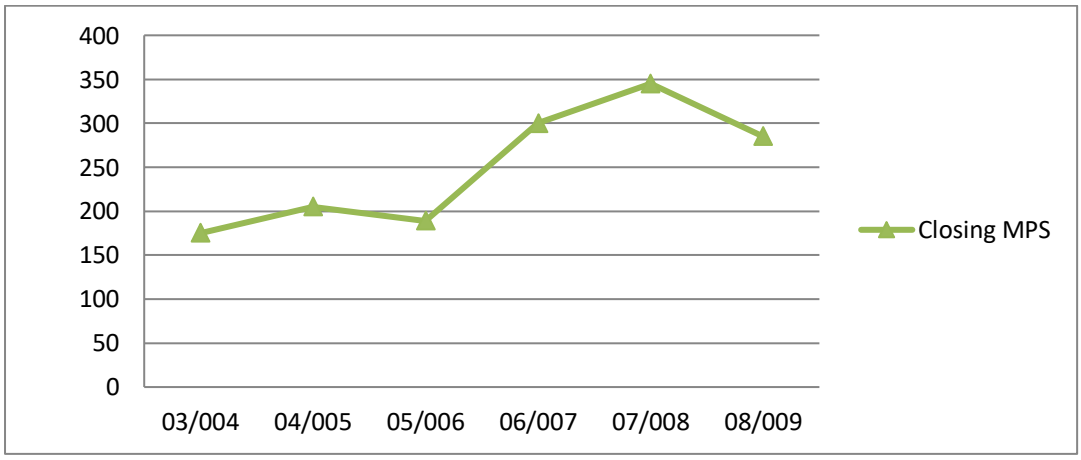
MPS and Dividend of Himalayan General Insurance Co. Ltd

F/Y	High MPS	Low MPS	Closing MPS	DPS	Stock Dividend	Total Dividend
03/004	190	165	175	0	0	0
04/005	207	170	205	0	0	0
05/006	215	171	189	0	0	0
06/007	300	198	300	5.79	0	5.79
07/008	348	315	345	5.26	0	5.26
08/009	375	285	285	0	0	0

Source:NEPSE

Figure 4.1

Year-end Price Movement of Common Stock of Himalayan Genera Insurance Co. Ltd



Price is maximum in the year 2007/08 and lowest in year 2003/04. Himalayan General Insurance Co. Ltd has not distributed any stock dividend. It has distributed cash dividend in the year 2006/07 & 07/08.

4.1.1.3 Realized Return (R), Expected Return ($\bar{R}$) and its Standard Deviation (σ)

Year-end price and dividend amounts are used to calculate dividend yield and capital gain yield is added to find for each year. Table 4.4 shows the calculation of yearly-realized return, expected return and standard deviation of returns.

Table 4.2

Realized Return, Standard Deviation and Expected Return of Himalayan General Insurance Co. Ltd.

F/Y	Closing MPS	Dividend	R= $\frac{D_t + (P_t - P_{t-1})}{P_{t-1}}$	R- $\bar{R}$	(R-$\bar{R}$)2
03/004	175	0	-		
04/005	205	0	0.171428571	0.030429	0.000926
05/006	189	0	-0.07804878	-0.21905	0.047982
06/007	300	5.79	0.617936508	0.476937	0.227468
07/008	345	5.26	0.167533333	0.026533	0.000704
08/009	285	0	-0.17391304	-0.31491	0.09917
			ΣR = 0.705	Σ(R-$\bar{R}$)2 =0.38	

Source: NEPSE

$Expected\ Return\ (\bar{R}) = \frac{\Sigma R}{N-1}$ = 0.705/5 =0.141

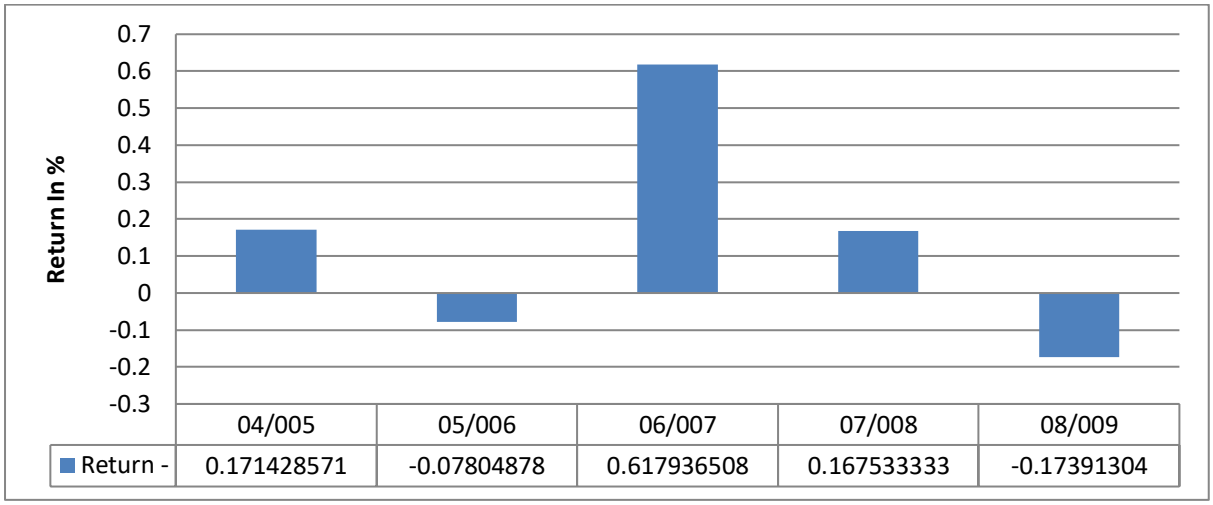
Standard Deviation (σ) $= \sqrt{\frac{\Sigma(R-R)2}{N-1}} = \sqrt{\frac{0.38}{6-1}}$ = 0.27

Co-efficient of Variation (C.V.) = σ/$\bar{R}$ = 0.87/0.141 = 6.17

Above result shows that expected return of the CS of Himalayan General Insurance Co. Ltd is 14.1% that is Low as compared to the market return 37.5% and investor should bear the risk of 6.17 and there is variability by 27% in the mean return on CS of Himalayan General Insurance Co. Ltd.

Figure 4.2

Annual Rate of Return of Common Stock of Himalayan General Insurance Co. Ltd.



4.1.2 United Insurance Co (Nepal) Ltd.

4.1.2.1 Introduction

United Insurance Co. (Nepal) Ltd. was incorporated in the year 1992 A.D. and listed in NEPSE in the year 1994. This insurance company was established with the authorized capital of Rs. 100000000.00. The paid-up value per share is Rs. 100. In summary,

Authorized Capital : Rs. 100000000.00
Paid-up Capital : Rs. 56621500.00
Issued Capital : Rs. 60000000.00
Par value of shares: Rs. 100
Number of shareholder/s : 3821

4.1.2.2 Data

Market price and dividend records of common stock of United Insurance Co. (Nepal) Ltd. are shown in Table 4.5. Closing MPS of United Insurance is Year-end price movement and annual found to be high in the year 20007/08. Dividends paid to shareholders of United Insurance Co. (Nepal) Ltd. are also shown in the same Table 4.3

Table 4.3

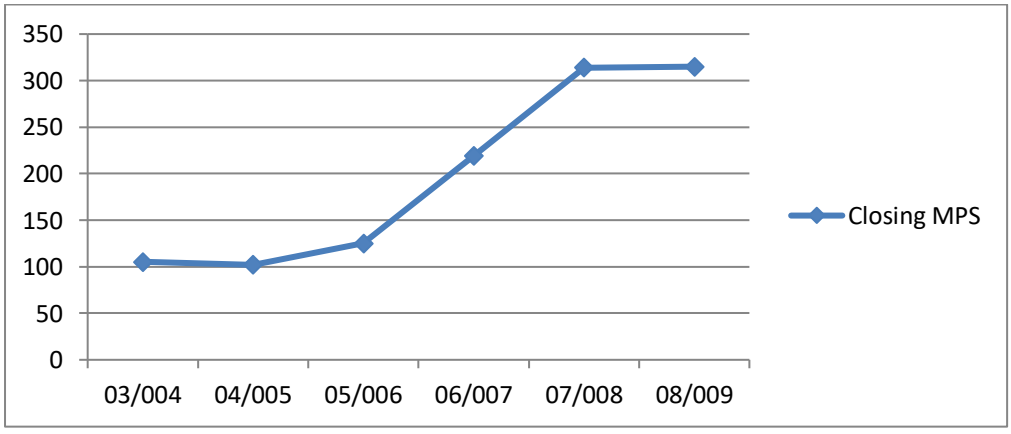
MPS and Dividend of United Insurance Co. (Nepal) Ltd.

F/Y	High MPS	Low MPS	Closing MPS	DPS	Stock Dividend	Total Dividend
03/004	132	105	105	0	0	0
04/005	122	133	102	0	0	0
05/006	165	118	125	0	0	0
06/007	220	120	219	1.2	0	0
07/008	317	192	315	0	0	0
08/009	294	294	314	0	0	0

Source:NEPSE,

Figure 4.3

Year-end Price Movement of Common Stock of United Insurance Co. (Nepal) Ltd.



Price is maximum in the year 2007/08 and lowest in year 2004/005.United Insurance Co. (Nepal) Ltd. has not distributed any stock dividend. It has distributed cash dividend in the year 2006/07.

4.1.2.3 Realized Return (R), Expected Return ($\bar{R}$) and its Standard Deviation (σ)

Year-end price and dividend amounts are used to calculate dividend yield and capital gain yield is added to find for each year. Table 4.6 shows the calculation of yearly-realized return, expected return and standard deviation of returns.

Table 4.4

Realized return, Standard Deviation and Expected Return of United Insurance Co. (Nepal) Ltd.

F/Y	Closing MPS	Dividend	R= $\frac{D_t + (P_t - P_{t-1})}{P_{t-1}}$	R-$\bar{R}$	(R-$\bar{R}$)2
03/004	105	0	0	-	-
04/005	102	0	-0.029	-0.308	0.095216
05/006	125	0	0.23	-0.054	0.002971
06/007	219	1.2	0.76	0.48	0.231939
07/008	314	0	0.43	0.153	0.023651
08/009	315	0	0.0031	-0.276	0.076627
			ΣR =1.40	Σ(R-$\bar{R}$)2=0.43	

$Expected\ Return\ (\bar{R}) = \frac{\Sigma R}{N}$ = 1.40/5 = 0.28

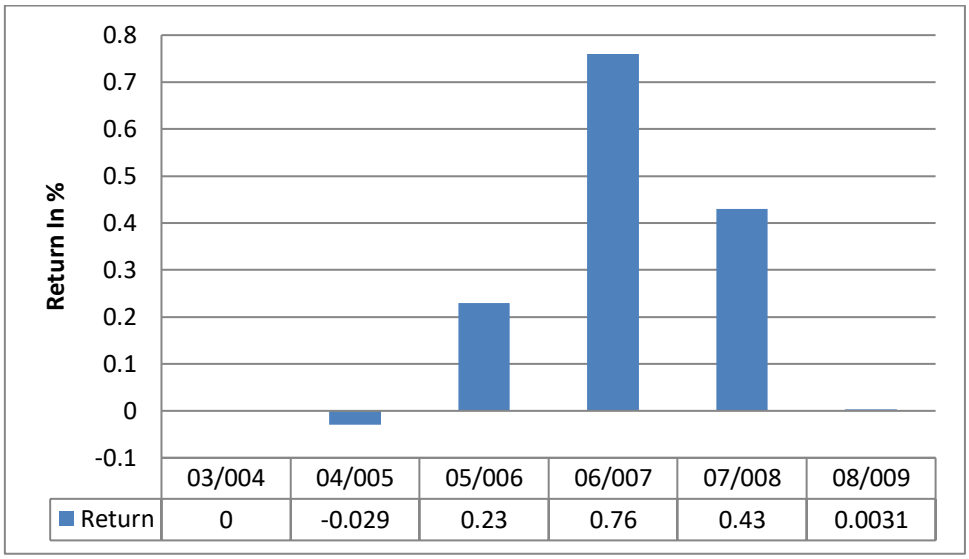
Standard Deviation (σ) $= \sqrt{\frac{\Sigma(R-R)2}{N-1}} = \sqrt{\frac{0.43}{6-1}}$ =0.29

Co-efficient of Variation (CV) = σ/$\bar{R}$ = 0.29/0.28=1.03

The result shows that expected return of the CS of United Insurance Co. (Nepal) Ltd. is 28% that is high as compared to the market return of 37.5% with standard deviation of 29.02% and coefficient of variation of 1.03

Figure 4.4

Annual rate of return of Common Stock of United Insurance Co.(Nepal) Ltd.



4.1.3 Premier Insurance Co. (NEPAL) Ltd.

4.1.3.1 Introduction

Premier Insurance Co. (Nepal) Ltd. was incorporated in the year 1992A.D. and listed in NEPSE in the year 1995. This insurance company was established with the authorized capital of Rs. 100000000.00. The paid-up value per share is Rs. 100. In summary,

Authorized Capital: Rs. 100000000.00

Paid-up Capital: Rs. 30000000.00

Issued Capital: Rs. 60000000.00

Par value of shares: Rs. 100

Number of shareholder/s: 6435

4.1.3.2 Data

Market price and dividend records of common stock of Premier Insurance Co. (Nepal) Ltd. are shown in Table 4.5. Closing MPS of Premier Insurance is found to be high in the year 2007/008.Year-end price movement and annual

dividends paid to shareholders of Premier Insurance Co. (Nepal) Ltd.are also shown in the same Table 4.5.

Table 4.5

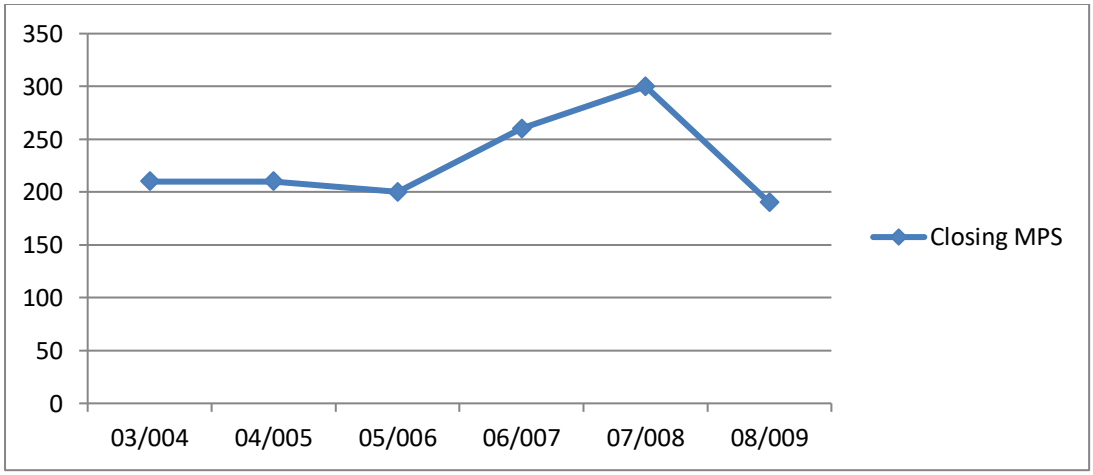
MPS and Dividend of Premier Insurance Co. Ltd.

F/Y	High MPS	Low MPS	Closing MPS	DPS	Stock Dividend	Total Dividend
03/004	210	192	210	0	0	0
04/005	210	195	210	0	0	0
05/006	214	190	200	0	0	0
06/007	260	200	260	0	0	0
07/008	318	260	300	5.79	10:11	2095.79
08/009	300	190	190	0	0	0

Source:NEPSE,

Figure 4.5

Year-end Price Movement of Common Stock of Premier Insurance Co. (Nepal) Ltd.



Price is maximum in the year 2007/008 and lowest in year 2008/009.Premier Insurance Co. (Nepal) Ltd. has distributed stock dividend in 2007/008 as 10:11 but has not distributed any cash dividend.

4.1.3.3 Realized Return (R), Expected Return ($\bar{R}$) and its Standard Deviation (σ)

Year-end price and dividend amounts are used to calculate dividend yield and capital gain yield is added to find for each year. Table 4.8 shows the calculation of yearly-realized return, expected return and standard deviation of returns.

Table 4.6

Realized return, Standard Deviation and Expected Return of Premier Insurance Co. (Nepal) Ltd

F/Y	Closing MPS	Dividend	R= $\frac{D_t + (P_t - P_{t-1})}{P_{t-1}}$	R-$\bar{R}$	(R-$\bar{R}$)2
03/004	210	0	-		
04/005	210	0	0	-1.62	2.6244
05/006	200	0	-0.048	-1.66762	2.780953
06/007	260	0	0.3	-1.32	1.7424
07/008	190	2095.8	8.21	6.594615	43.48895
08/009	300	0	-0.37	-1.98667	3.946844
			ΣR =8.10	Σ(R-$\bar{R}$)2=54.58	

$Expected\ Return\ (\bar{R}) = \frac{\Sigma R}{N}$ = 8.10/5 =1.62

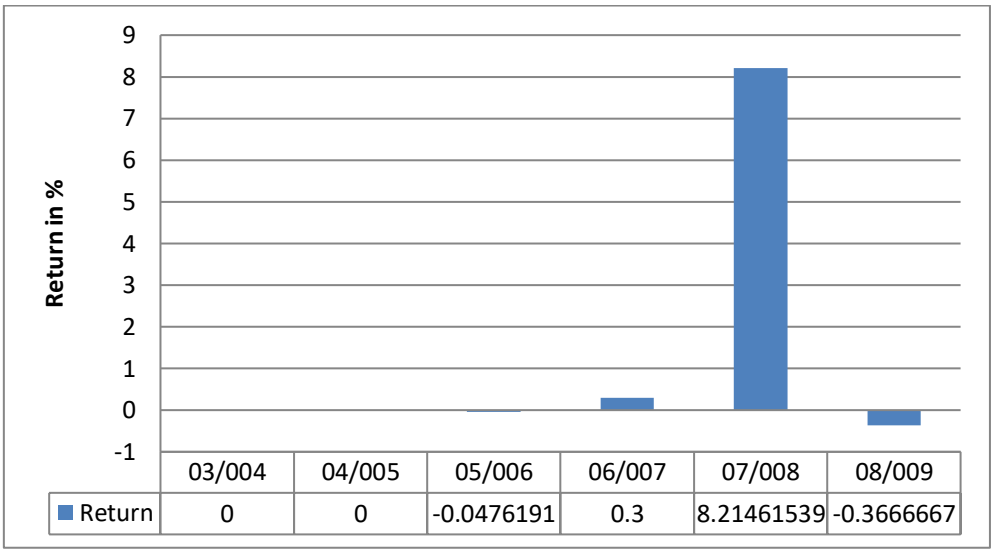
Standard Deviation (σ) $= \sqrt{\frac{\Sigma(R-R)2}{N-1}} = \sqrt{\frac{54.58}{6-1}}$ =3.30

Co-efficient of Variation (CV) = σ/$\bar{R}$ = 3.30/1.62=2.03

Result shows that expected return of the CS of Premier Insurance Co. (Nepal) Ltd. is 162% that is high as compared to the market return of 37.5% and investor should bear the risk of 3.3% and there is variability by 2.03% in the mean return on CS of Premier Insurance Co. (Nepal) Ltd.

Figure 4.6

Annual Rate of Return of Common Stock of Premier Insurance Co. (Nepal) Ltd.



4.1.4 Nepal Insurance Company Limited

4.1.4.1 Introduction

Nepal Insurance Company Limited was incorporated in the year 1947 A.D. in the name of Mal Chalani and Beema Co. Later in the year 1991 A.D.name of company was changed to Nepal Insurance Company Limited. This company was listed on 1984 A.D in NEPSE. Authorized capital, paid-up capital,issued capital, par value of shares and number of shareholders are as below:

Authorized Capital : Rs. 150000000.00

Paid-up Capital : Rs. 250000000.00

Issued Capital : Rs. 100000000.00

Par value of shares : Rs. 100

Number of shareholder/s : 9774

4.1.4.2 Data

Market price and dividend records of common stock of Nepal Insurance Company Limited are shown in Table 4.7. Closing MPS of Nepal Insurance Company Limited is found to be high in the year 2005/006. Year-end price

movement and annual dividends paid to shareholders of Nepal Insurance Company Limited are also shown in the same Table 4.7.

Table 4.7

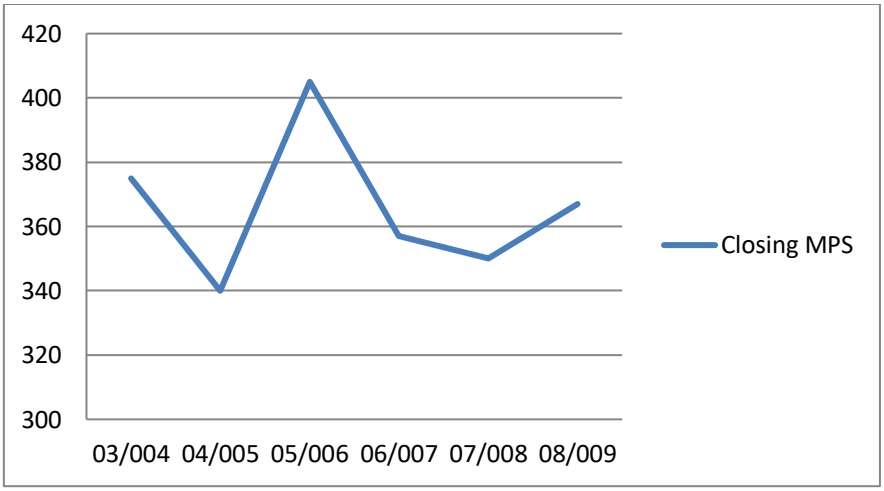
MPS and Dividend of Nepal Insurance Company Ltd.

F/Y	High MPS	Low MPS	Closing MPS	DPS	Stock Dividend	Total Dividend
03/004	446	360	375	0	0	0
04/005	375	340	340	0	0	0
05/006	450	370	405	0	0	0
06/007	400	357	357		0	0
07/008	357	345	350	0	0	0
08/009	367	357	367	0	0	0

Source:NEPSE,

Figure 4.7

Year-end Price Movement of Common Stock of Nepal Insurance Company Ltd.



Price is maximum in the year 2005/006 and lowest in year 2004/005. Nepal Insurance Company Ltd. has not distributed any stock dividend .

4.1.4.3 Realized Return (R), Expected Return ($\bar{R}$) and its Standard Deviation (σ)

Year-end price and dividend amounts are used to calculate dividend yield and capital gain yield is added to find for each year. Table 4.8 shows the calculation of yearly-realized return, expected return and standard deviation of returns.

Table 4.8

Realized Return, Standard Deviation and Expected Return of Nepal Insurance Company Ltd

F/Y	Closing MPS	Dividend	R= $\frac{D_t + (P_t - P_{t-1})}{P_{t-1}}$	R-$\bar{R}$	(R-$\bar{R}$)2
03/004	375	0	-		
04/005	340	0	-0.09333333	-0.09499	0.009024
05/006	405	0	0.191176471	0.189516	0.035916
06/007	357	0	-0.11851852	-0.12018	0.014443
07/008	350	0	-0.01960784	-0.02127	0.000452
08/009	367	0	0.048571429	0.046911	0.002201
			ΣR =0.008288	Σ(R-$\bar{R}$)2=0.062	

$Expected\ Return\ (\bar{R}) = \frac{\Sigma R}{N}$ = 0.008288/5 =0.0016

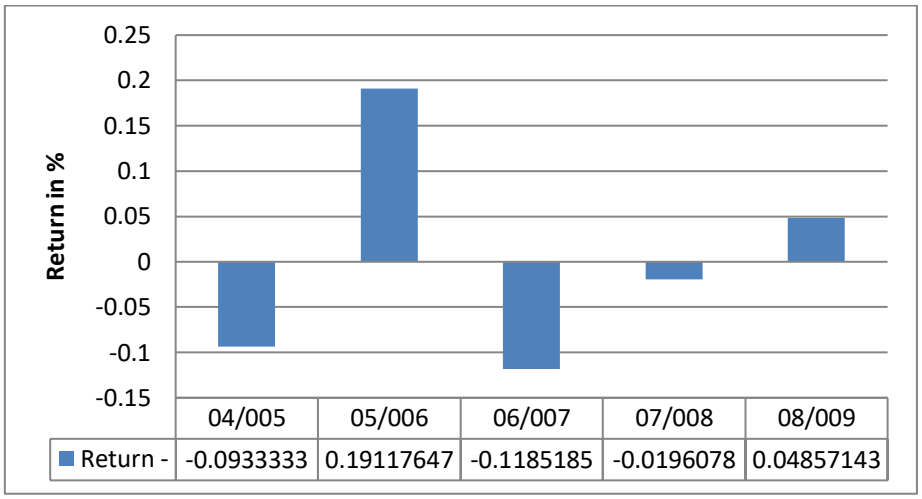
Standard Deviation (σ) $= \sqrt{\frac{\Sigma(R-R)2}{N-1}} = \sqrt{\frac{0.062}{6-1}}$ =0.1113

Co-efficient of Variation (CV) = σ/$\bar{R}$ = 0.1113/0.0016=69.59

Result shows that expected return of the CS of Nepal Insurance Company Ltd is 0.16% that is Very Low as compared to the market return of 37.5% and investor should bear the risk of 11.13% and there is variability by 69.5% in the mean return on CS of Nepal Insurance Company Ltd

Figure 4.8

Annual rate of return of Common Stock of Nepal Insurance Company Nepal Ltd



4.1.5 Everest Insurance Company Ltd.

4.1.5.1 Introduction

Everest Insurance Company was incorporated in the year 1992 A.D. and listed in NEPSE in the year 1995. This insurance company was established with the authorized capital of Rs. 100000000.00. The paid-up value per share is Rs. 100. In summary,

Authorized Capital : Rs. 100000000.00

Paid-up Capital : Rs. 90000000.00

Issued Capital : Rs. 30000000.00

Par value of shares: Rs. 100

Number of shareholder/s: 4912

4.1.5.2 Data

Market price and dividend records of common stock of Everest Insurance Company are shown in Table 4.9. Year-end price movement and annual dividends paid to shareholders of Everest Insurance Company are also shown in the same Table 4.9.

Table 4.9

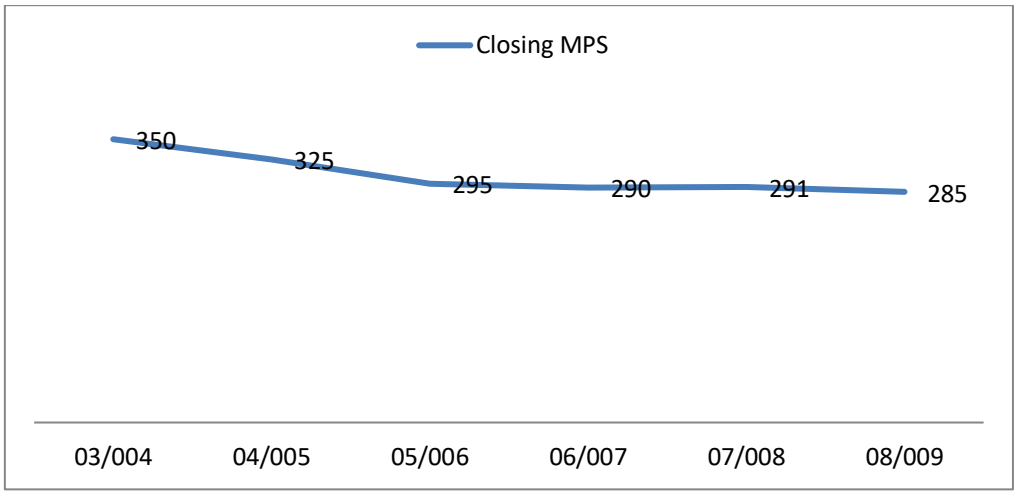
MPS and Dividend of Everest Insurance Company Ltd.

F/Y	High MPS	Low MPS	Closing MPS	DPS	Stock Dividend	Total Dividend
03/004	651	350	350	0	0	0
04/005	350	263	325	0	0	0
05/006	325	290	295	0	0	0
06/007	305	281	290		0	0
07/008	333	280	291	0	0	0
08/009	300	285	285	0	0	0

Source:NEPSE

Figure 4.9

Year-end Price Movement of Common Stock of Everest Insurance Company Ltd.



Price is maximum in the year 2003/004 and lowest in year 2008/009. Everest Insurance Company Ltd. has not distributed any stock dividend and has not distributed any cash dividend.

4.1.5.3 Realized Return (R), Expected Return ($\bar{R}$) and its Standard Deviation (σ)

Year-end price and dividend amounts are used to calculate dividend yield and capital gain yield is added to find for each year. Table 4.8 shows the calculation of yearly-realized return, expected return and standard deviation of returns.

Table 4.10

Realized Return, Standard Deviation and Expected Return of Everest Insurance Company Ltd.

F/Y	Closing MPS	Dividend	$R=\frac{D_t+(P_t-P_{t-1})}{P_{t-1}}$	R-$\bar{R}$	(R-$\bar{R}$)2
03/004	350	0	-		
04/005	325	0	-0.07142857	-0.03143	0.000988
05/006	295	0	-0.09230769	-0.05231	0.002736
06/007	290	0	-0.01694915	0.023051	0.000531
07/008	291	0	0.003448276	0.043448	0.001888
08/009	285	0	-0.02061856	0.019381	0.000376
			ΣR =-0.1978	Σ(R-$\bar{R}$)2=0.06519	

$Expected\ Return\ (\bar{R}) = \frac{\Sigma R}{N}$ = -0.1978/5 = -0.04

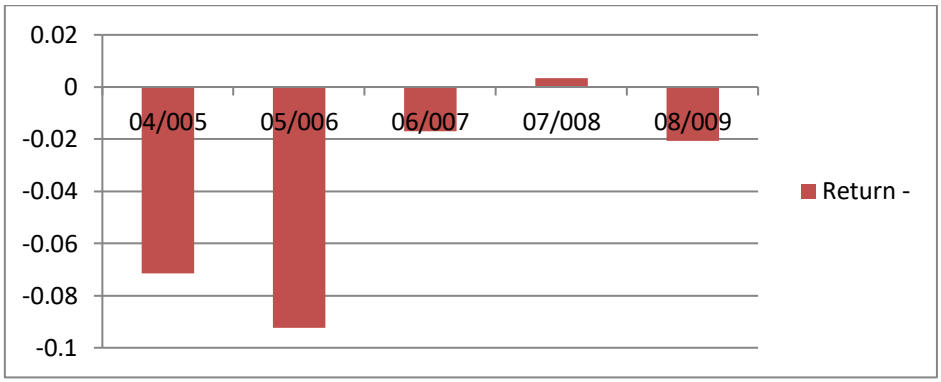
Standard Deviation (σ) $= \sqrt{\frac{\Sigma(R-R)2}{N-1}} = \sqrt{\frac{0.06519}{6-1}}$ = 0.114

Co-efficient of Variation (CV) = σ/$\bar{R}$ = 0.114/-0.04 = -2.85

Result shows that expected return of the CS of Everest Insurance Company Ltd**.** is -4% that is high as compared to the market return of 37.5% and investor should bear the risk of 11.4% and there is variability by -2.85% in the mean return on CS of Everest Insurance Company Ltd**.**

Figure 4.10

Annual Rate of Return of Common Stock of Everest Insurance Company Ltd.



4.1.6 Market Risk and Return

4.1.6.1 Introduction

The one and only one stock market in Nepal is Nepal Stock Exchange (NEPSE). Price fluctuation in market is represented by the NEPSE Index or Market Index. So, the market return, standard deviation and coefficient of variation is based on the NEPSE index in this research work.

4.1.6.2 Data

Market Portfolio return, its Standard Deviation and Co-efficient of variation is shown in Table 4.11.

Table 4.11

Calculation of Returns, S.D., Expected Returns and C.V. of Market

F/Y	NEPSE Index	$Rm = \frac{(NI_t - NI_{t-1})}{NI_{t-1}}$	Rm-$\overline{Rm}$	(Rm-$\bar{R}m$)2
03/004	222.04	0.08	-0.2954	0.1764
04/005	286.67	0.29	-0.0854	0.0441
05/006	300.05	0.047	-0.3284	0.205209
06/007	683.95	1.28	0.9046	0.294849
07/008	963.36	0.40	0.0246	3.4225
08/009	749.10	-0.22	-0.5954	0.5184
		ΣRm=1.87		Σ(R-$\bar{R}$)2=1.29

$Expected\ Return\ (\bar{R}m) = \frac{\Sigma Rm}{N-1}$ = 1.87/5 =0.3754

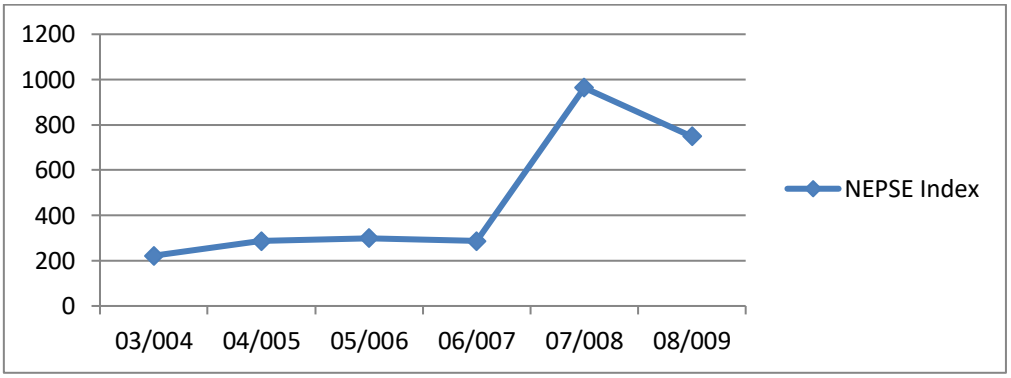
Standard Deviation (σ_M) $= \sqrt{\frac{\Sigma(Rm-Rm)2}{N-1}} = \sqrt{\frac{1.29}{6-1}}$ =0.50

Co-efficient of Variation (CV) = σm/$\bar{R}m$ = 0.50/0.3754=1.35

It shows market return is 37.54% and variation in mean return is 50% and risk is 1.35

Figure 4.11

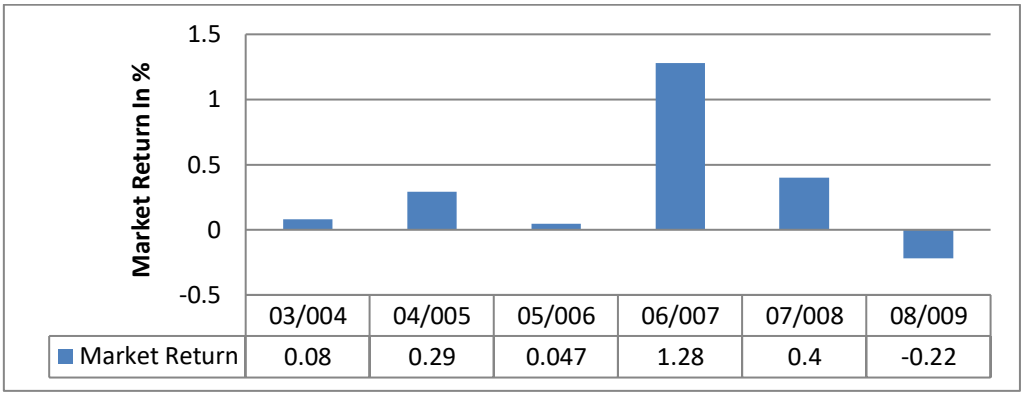
Market Index Movements.



In the year 2007/008, the NEPSE index was high at 963.36 and was low in the year 2003/004 with index of 222.4. The NEPSE index seems to be fluctuating from the 2006/007. There are lots of ups and downs in the index. In the first Five years (from 2003/004 to 2007/08) the NEPSE index was in Increasing trend and reached at the Highest point in the year 2007/008 Then, NEPSE index began to declining and reached the 749.10 in the year 2008/009.

Figure 4.12

Market Return Movements



Market return was high in the year 2006/007 which was 128% There were only One Negetive returns from market In 2008/09 Year but in average the market return is 37.54% only with the variance of 50%.

4.1.6.3 Analysis of Market Sensitivity

Analysis of market sensitivity gives very useful insight in the analysis and the selection procedure of common stock in the market which is explained by its beta co-efficient. Higher the beta greater is the sensitivity and higher will be the reaction by the individual common stock with the given movement in the market status. Beta measures the systematic risk, which cannot be eliminated through the means of diversification. Beta co-efficient of market is always 1. This statement can be proved as follows:

$$\beta_j = \frac{COV(R_j,R_m)}{\sigma_m 2} = \frac{\sigma_i \sigma_m P_{im}}{\sigma_m 2} = \frac{\sigma_i P_{im}}{\sigma_m}$$

Where,P_{im}=Correlation between market return and individual stock's return.

$$\text{Hence,} \quad \beta_m = \frac{COV(R_m,R_m)}{\sigma_m 2} = \frac{\sigma_m \sigma_m P_{mm}}{\sigma_m 2} = P_{mm} = 1$$

Hence, Beta Coefficient of market is always equal to 1

Table 4.12

Beta Coefficient for Insurance Company

Company	Beta	Remarks	
Himalayan General	0.67	High Beta	All insurance's Beta are less than 1 so they are defensive company
United Insurance	0.63		
Premier Insurance	0.82	High Beta	
Nepal Insurance	-0.20	Low Beta	
Everest Insurance	0.03		

From the above table, it can be concluded that Premier Insurance is more sensitivity to the market than other remaining companies and Nepal Insurance Company is less sensitive than other with the market.

4.2 Inter Company Comparison

On the basis of above section 4.1, comparative analysis of return and total risk (σ) are performed here. Expected return, standard deviations of returns, coefficient of variations of each bank for the year 2003/004 to 2008/009 are given in Table 4.13.

Table 4.13

Expected Return, S.D. and C.V. of each Company

Company	$\bar{R}$	S.D.	C.V.	Remark
HGICL	0.14	0.27	6.17	
UICNL	0.28	0.29	1.03	Moderate Return and S.D
PICNL	1.62	3.3	2.03	Highest Standard Deviation & Return
NICL	0.0016	0.1113	69.59	Highest C.V.
EICL	-0.04	0.114	-2.85	

Figure 4.13

Expected Return, S.D. and C.V. of each Company

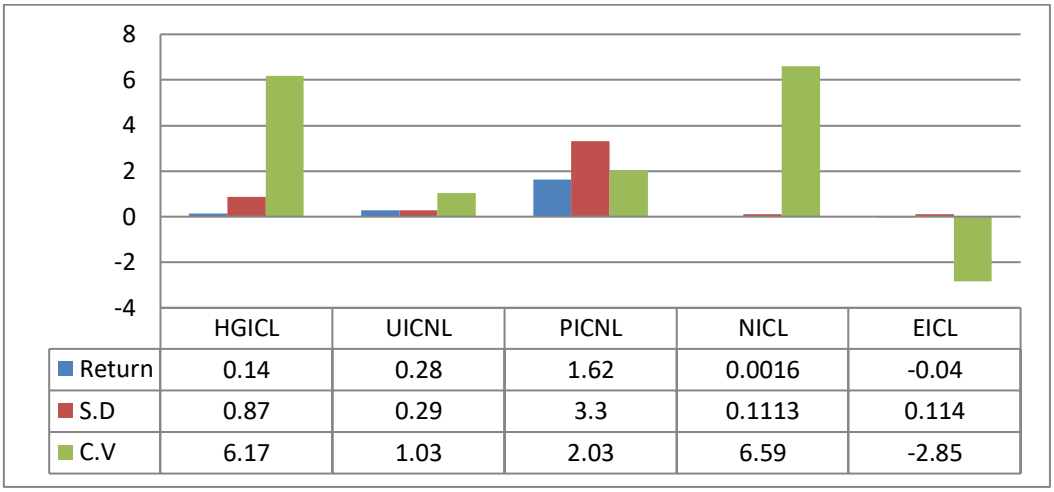


Table 4.14

Systematic and Unsystematic Risk of Individual Bank

Company	Beta	S.D	Systematic Risk	Unsystematic Risk
HGICL	0.67	0.27	0.1158	-0.04
UICNL	0.63	0.29	0.102	-0.0164
PICNL	0.82	3.3	0.1734	-10.69
NICL	-0.20	0.1113	0.010	0.22
EICNL	0.03	.114	0.00023	0.012

Higher the beta, higher the systematic risk. It can be clear from the above table that company high beta has high systematic risk. Beta is the indicator of systematic risk.

4.2.1 Market Capitalization of Individual Company

Based on the market capitalization at 2009, mid July, size of each insurance company is presented in Table 4.15. Market capitalization is the total market value at specific time period of the company, industry and market as a whole.

Table 4.15

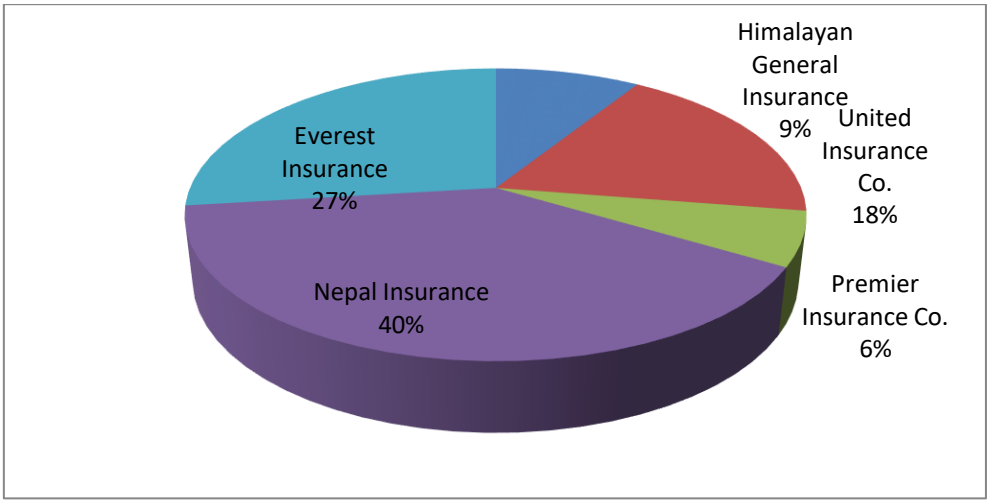
Market Capitalization at Mid July 2009

Companies	**Market capitalization (Rs. In Millions)**
Himalayan General Insurance	85.5
United Insurance Co.	176.4
Premier Insurance Co.	57
Nepal Insurance	376.9
Everest Insurance	256.5

Source: NEPSE 2009

Figure 4.14

Market Capitalization at Mid July 2008-Mid July 2009



Similarly a comparison is made on the movement of market capitalization. The table 4.16 shows the comparative movement of market capitalization of insurance companies.

Table 4.16

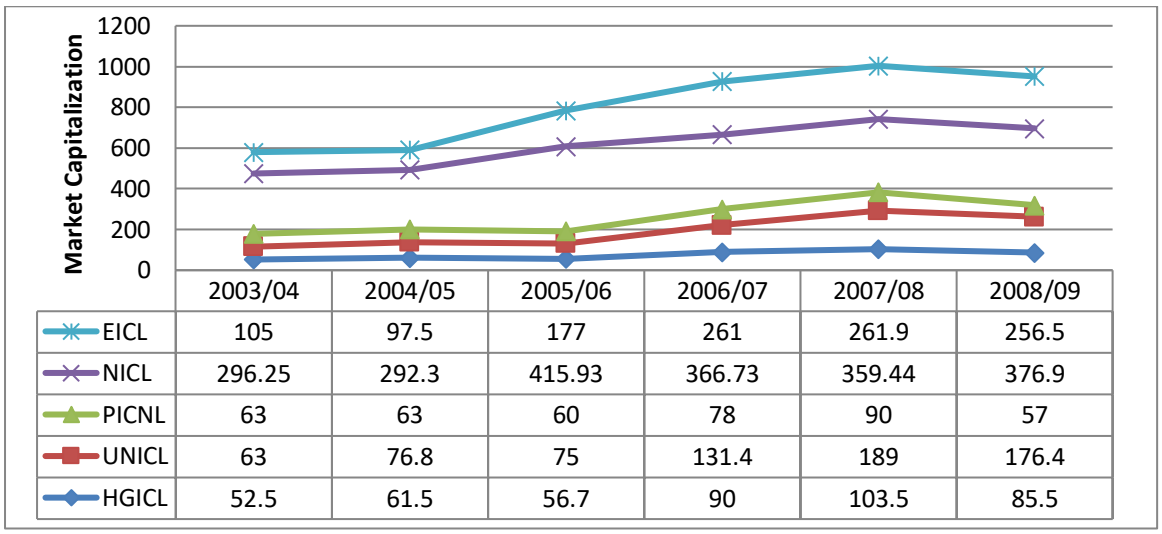
Year-Wise Comparative Movement of Market Capitalization

(in Million)

Companies	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
HGICL	52.50	61.50	56.70	90.00	103.50	85.50
UNICL	63.00	76.80	75.00	131.40	189.00	176.4
PICNL	63.00	63.00	60.00	78.00	90.00	57.00
NICL	296.25	292.3	415.93	366.73	359.44	376.9
EICL	105	97.5	177	261	261.9	256.5

Figure 4.15

Year-wise Comparative Movement of Market Capitalization



Coefficient of variation (CV) is the most appropriate basis of taking decision on the investment in single security because it measures risk per unit return of a stock. So S.D. and expected return are included in it. As indicated in diagram 4.15, the line that are nearer to the x-axis means that investor must be careful to invest in that security regarding its CV.

4.3 Inter Industry Comparison

By the end of F/Y 2008/09, the market capitalization value of the listed securities reached at Rs. 360373 million. In the last fiscal year this value was

Rs. Rs. 308770.38 million. During this year, the highest value of market capitalization was Rs. 192611.17million and the lowest was Rs. 260 million. The percentage contribution of Market capitalization on GDP is estimated to be 9.35%. To compare size of industries, Table 4.17 and the Figure 4.16 are presented below. We can observe the commercial banking industry has majority value of total market share i.e. 53.45% and insurance companies have only 2.4% market share.

Table 4.17

Market Capitalization of each Industry at July 15 2009

Industries	Market Capitalization (Rs In Millions)	Percent
Commercial Bank	192611.17	53.45
Development Bank	16648.39	4.62
Finance Company	17342.23	4.81
Insurance Company	8640.23	2.4
Hotel	3346.41	0.93
Manufacturing & processing Company	5424.58	1.50
Trading Company	980.70	0.27
Others	94350.00	26.18
Mutual Fund	260	0.072
Hydro Power	20769.65	5.76
Total	360373	100

Source: Securities Board, Nepal, Annual Report 2008/2009.

Figure 4.16

Market Capitalization of each Industry at July 15,2009

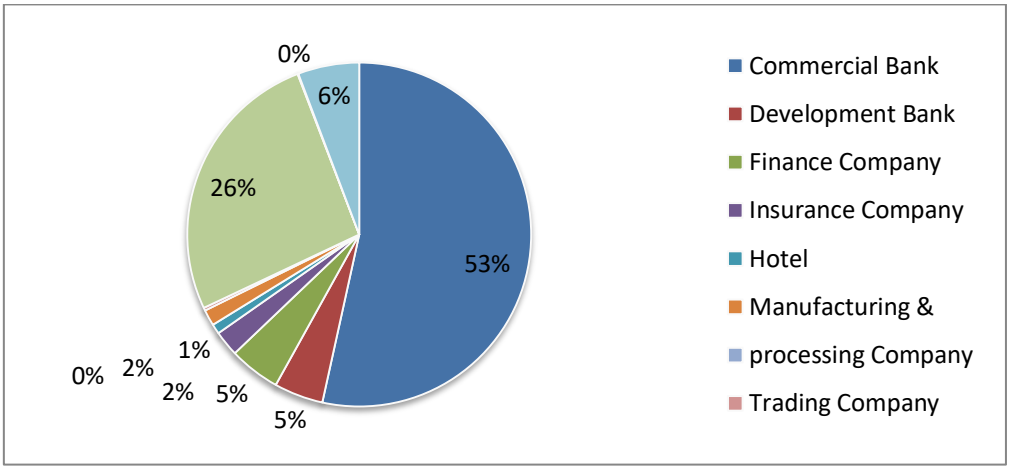


Table 4.18

Industry wise Market Capitalization

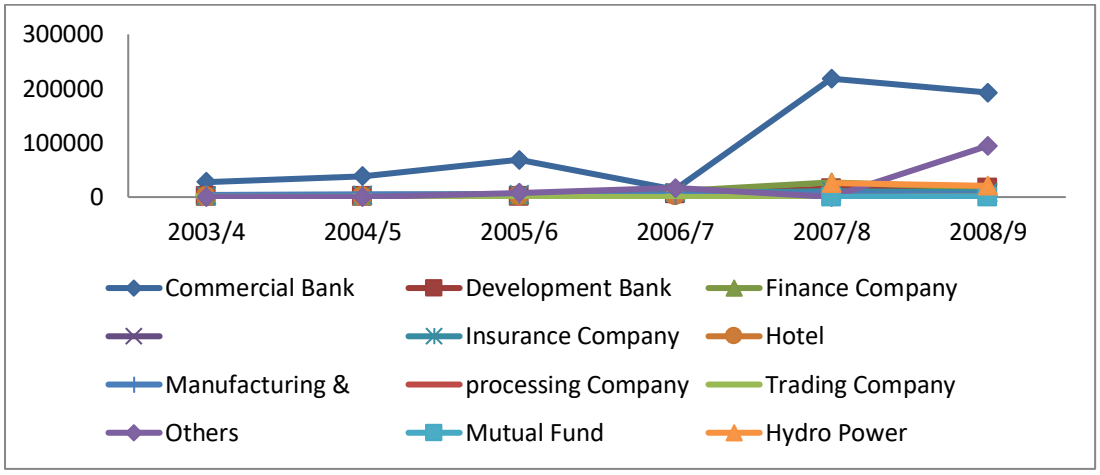
(Rs. in Million)

Industries	03/4	04/5	05/6	06/7	07/8	08/09
Commercial Bank	27958.8	38547.1	68841.24	13808.43	218264.19	192611.17
Development Bank	796.85	1049.7	1227.49	5980.8	15619.36	16648.49
Finance Company	2942.27	3471.5	4930.63	11491.4	27113.59	17342.23
Insurance Company	2549.3	3659.86	4852.19	7959.78	10897.16	8640.23
Hotel	1065.86	1016.45	2393.61	1935.59	3484.13	3346.41
Manufacturing Company	4472.75	4585.66	4619.20	3760.28	6576.18	5424.58
Trading Company	603.53	802.4	737.39	787.4	686.73	980.7
Others	65.35	41.87.73	8012.2	16503.02	18.67	94350
Mutual Fund	-	-	-	-	247	260
Hydro Power	-	-	-	-	25863.26	20769.23

Source : Securities Board, Nepal, Annual Report 2008/2009.

Figure 4.17

Industry Wise Movement of Market Capitalization



Before year 2001/02, the different company that was listed in NEPSE was categorized into six sectors i.e. Banks, Manufacturing & Processing Company, Hotel, Trading Company, Finance Company and Insurance Company and Others. But from the year 2001/02, it was categorized into eight sectors, splitting Banking sector into Commercial Banks and Development Banks and Finance Company and Insurance Company as a separate sectors. And from the year 2007/08, it was categorized into Ten sectors Like, Mutual Funds and Hydropower So, for the convenient of the study in Table 4.19, the NEPSE index of Commercial Bank and Development bank from year 2001/02 to 2003/04 as an average of the respective years. And as so for the Insurance Company and Finance Company.

Table 4.19

Industry Wise NEPSE Index at Closing date of F/Y

F/Y	Com.Banking	Manfg.	Hotel	Others	Trading	Insurance	Finance	Dev. Banking	Hydro Power.	Total
003/4	199.3	250.1	196.6	48.56	94.56	240.64	207.93	247.49	-	204.4
004/5	232.8	255.5	184.9	142.6	95.01	237.39	196.32	190.03	-	222.6
005/6	437.5	301.1	180.7	410	148.11	381.25	261.37	294.4	-	386.8
006/7	439.6	301.6	180.7	408.1	148.11	382.42	261.46	294.40	-	388.1
007/8	804.2	348.6	251.4	818.1	162.19	616.26	471.79	543.58	886.8	696.5
008/9	1011	423.6	360.1	769.2	204.08	819.94	1159.1	1346.36	1311	982.1

Source: NEPSE

Table 4.20

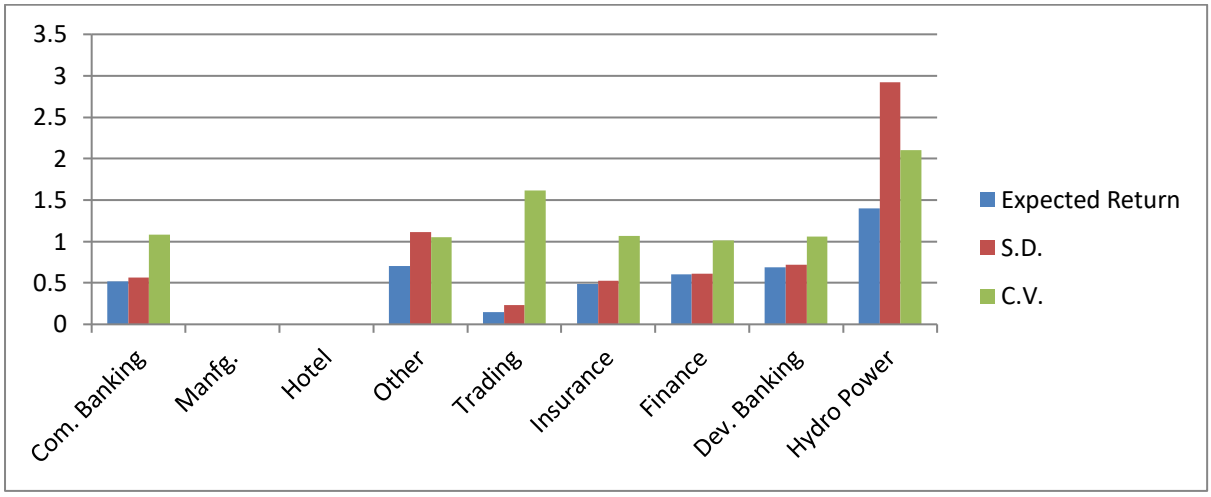
Expected Return, SD and CV of Industries

Industry	Expected Return	S.D.	C.V.
Com. Banking	**0.52194**	**0.4604**	**.8820**
Manfg.	0.3456	0.5734	1.66
Hotel	0.2845	0.3981	1.40
Other	0.7062	1.05	1.49
Trading	0.1437	0.2323	1.616
Insurance	0.49065	0.5253	1.65
Finance	0.60275	0.6112	1.014
Dev. Banking	0.6858	0.7219	1.06
Hydro Power	1.4	2.925	2.1025

Expected rate of return, Standard Deviation and Co-efficient of variation are taken as a main concern to compare between industries. Return of each industry is calculated on the basis of industry-wise NEPSE index; Year-end industry wise index is given in Table 4.19. Similarly Table 4.20 shows these variables of each industry. Details of the calculation of each variables of each industry are shown in Appendices.

Figure 4.18

Industry Wise Expected Return, S.D. and C.V.



Expected Return S.D. C.V. Expected Return and risk (Standard Deviation) are found to be high in Hydropower Industry, Expected rate of return is 140% and Standard Deviation is 292.5%. Expected Return and risk on Trading Industry is low. Market return was high in 2006/007 and low in the year 2008/009. It is in decreasing In comparison with market return (37.54%), Banking Industry (52.19%), Hotel Industry (28.45%) Finance and Insurance Industry (60.27%), Processing Industry (34.56%), Trading Industry (14.37%) , others Industry (7.72%) and Hydropower Company (140%)have higher expected return than market return.

In comparison with market risk (50%), Banking Industry (46.04%), Manufacturing and Processing Industry (57.36%), Hotel Industry (39.81%), Finance and Insurance (61.12%) and Insurance Companies(52.53%) Others (111.1%) and Hydropower (292.5) have higher risk than market risk.

4.4 Pricing Model

In this part of the research, Capital Assets Pricing Model (CAPM) is used as pricing model. In the above section 4.1.6.3, it is already calculated the beta coefficient for individual company. The rate of treasure bill at the year ended

16 July, 2009 is 4.01%. So the price situation on the basis of CAPM model is as below:

Table 4.21

Equilibrium Return, Expected Return and Price Evaluation

Company	Beta	$E(R_i) = R_f+(R_m-R_f)\beta_i$	Expected Return ($\bar{R}$)	Price Situation
HGICL	0.67	**13.71%**	14%	**Under price**
UICNL	0.63	**13.13%**	28%	**Under price**
PICNL	0.82	**15.90%**	16.2%	**Under price**
NICL	-0.20	**1.12%**	0.16%	**Over price**
EICL	0.02	**4.30%**	-4%	**Over price**

Most of Insurance company's stock are underpriced so all company are having stock with a good investment opportunities Except NICL and EICL. Their stock value will increased in the future providing investor's high return. Rational and efficient investment decision maker need to analyze other dimensions too.

4.4.1 Analysis of Risk Diversification

If the portfolio is created, it reduces the unsystematic risk dramatically without losing considerable return. Therefore, a brief analysis of risk and return is extended to portfolio context. The expected return of a portfolio is simply a weighted average of the expected returns of securities comprising that portfolio. The weights are equal to the proportions of the total funds invested in each security. "Not putting all eggs in one basket" or spreading the risks means simple diversification. The analysis is based on two assets and the tools for analysis are based on two assets and tools for analysis are presented in Chapter three.

Table 4.22 shows the calculation of covariance of the returns of the given two stocks COV (R_A, R_B) and proportion of stock A (W_A) that minimizes the risk, standard deviation.

$$WA = \frac{\sigma_{B^2} - COV(R_A, R_B)}{\sigma_{A^2} + \sigma_{B^2} - 2cov(R_A, R_B)}$$

W = Weight of Stock A that minimize the portfolio risk of stock A & B.

σ_A^2 = Standard Deviation of stock A

σ_B^2 = Standard Deviation of stock B.

Table 4.22

Portfolio Risk and Return

S.N	Portfolio	weight	Covariance	$\bar{R}_P$	σ_P
1	HGICL & UICNL	W(H)=0.56 W (U)=0.44	-0.012	22.28	45.25
2	HGICL & PICNL	W(H)=0.47 W (P)=0.53	-0.023	18.96	12.84
3	UICNL & PICNL	W (U)=0.37 W (P)=0.63	0.007	13.96	18.70
4	PICNL & EICL	W (P)= 1.005 W (E)=-.0055	0.0711	-0.04913	0.68
5	UICNL & EICL	W (U)= 0.91 W (E)=0.09	0.005	25.47	0.27
6	HGICL & EICL	W (H)= 0.12 W (E)=0.88	0.0034	-1.83	0.1350
7	EICL & NICL	W (E)=0.49 W (N)=0.51	-0.00194	-1.87	0.0732
8	PICNL & NICL	W (P)=0.0055 W (N)=0.9945	-0.048	1.05	0.2114
9	UNICL & NICL	W (U)=0.20 W (N)=0.80	-0.011	5.72	0.090
10	HGICL & NICL	W(H)=0.27 W (N)=0.73	-0.023	3.91	0.4496

Source: Annex 15-25

By using diversification, we can eliminate risk. Diversification can only reduce risk but cannot increase return. Portfolio return is simply the average return of individual security's returns. Hence, average of high return is also high.

While creating portfolio between UICNL and EICL, expected return is very high, 25.47% and their weight is 0.91 and 0.09 respectively. Borrowing from the EICL and investing in PICNL is found that help investor to save from huge loss. Variation in mean return is 44.96% that is moderate as compared to other investing options in the combination of HGICL and NICL. Creating portfolio between PICNL and EICL, the risk can be minimized up to 68% but return will even in minus 4.91%.

4.4.2 Correlation

Most stocks are negatively correlated, not perfectly. In this situation, some risk can be reduced. Here, Correlation between each company is presented below:

Table 4.23

Correlation between each Company

	HGICL	**UICNL**	**PICNL**	**NICL**	**EICL**
HGICL	1	-0.17	-0.41	-0.75	0.1146
UICNL		1	0.10	-0.34	0.15
PICNL			1	-0.13	0.189
NICL				1	-0.15
EICL					1

Source: Annex 26-27

4.4.3 Portfolio Optimization

For the simplicity of the work, software designed by Crang W. Holden Finance Professor is accessed so as to design the optimal portfolio within the assets of, HGICL, UICNL, PICNL,NICL and EICL.

Inputs	Expected Return	Standard Deviation
Return on T.B	4.01	0.00
HGICL	14.1%	27%
UICNL	28%	29%
PICNL	1.62%	3.3%
NICL	0.16%	11.13%
EICL	-4%	11.4%

Correlation

	HGICL	UICNL	PICNL	NICL	EICL
HGICL	**100**	-0.17	-0.41	-0.75	0.1146
UICNL	-0.17	**100**	0.10	-0.34	0.15
PICNL	0.41	0.10	**100**	-0.13	0.189
NICL	-0.75	-0.34	-0.13	**100**	-0.15
EICL	0.1146	0.15	0.189	-0.15	**100**

Variance and Co-Variance

Variance & Co-variance							One Plus Expected Return
	HGICL	**UINCL**	**PICNL**	**NICL**	**EICL**	**T.B**	104.01%
HGICL	7.29	-0.012	-0.023	-0.023	0.0034	**HGICL**	114.1%
UINCL	-0.012	8.41	0.007	-0.011	0.005	**UINCL**	128%
PICNL	-0.023	0.007	108.9	-0.048	0.0711	**PICNL**	162%
NICL	-0.023	-0.011	-0.048	1.23	0.00194	**NICL**	116%
EICL	0.0034	0.005	0.0711	0.00194	1.29	**EICL**	96%

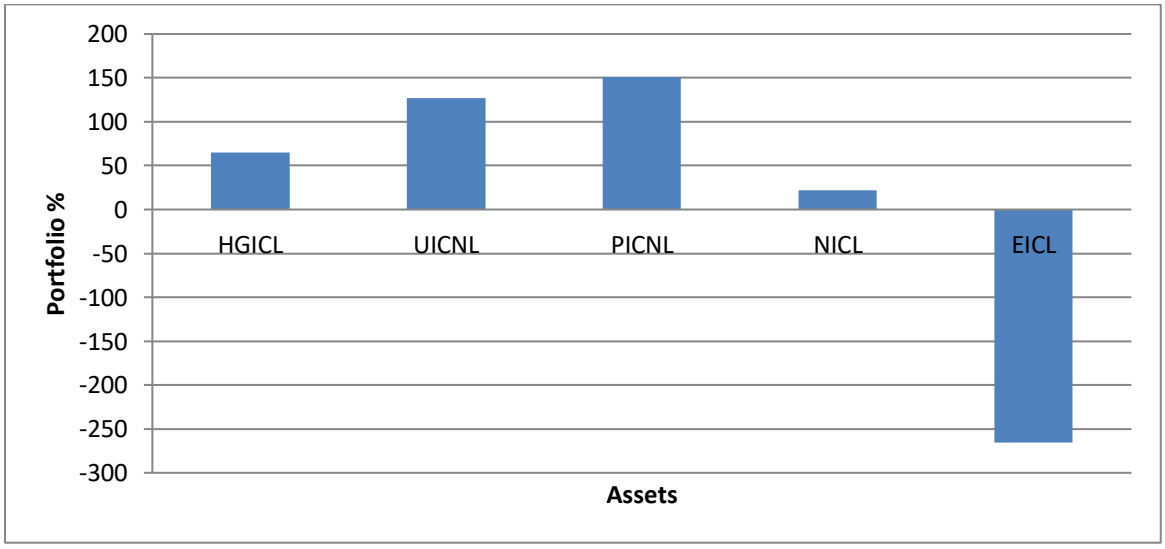
Output

A	7.4
B	8.10
C	9.05
Delta	1.34
Gamma	2.047

	Index	Standard Deviation	Expected Return	Individual Assets Expected Return	Optimal Combination of Risky Assets (Tangent Portfolio)
HGICL		27%		14.1%	65.04
UICNL		29%		28%	127.17
PICNL		3.3%		1.62%	151.21
NICL		11.13%		0.16%	21.98
EICL		11.4%		-4%	-265.4
Optimal Combination		93.9%	48.25%		
Efficient Trade off Line	0%	0%	4.01%		
Efficient Trade off Line	100%	93.9%	48.25%		
Efficient Trade off Line	200%	187.8%	94.3%		

Figure 4.19

Portfolio Weights in an Optimal Portfolio



The given Software produces the optimal combination of five assets. The expected return from the given assets is 48.25% with standard deviation of

93.9% with the weight of 21.98% on NICL, 65.04% on HGICL, 151.21% on PICNL, UICNL on -127.17% and borrowing -265.4% with EICL.

4.5 Major Findings

Major findings of the study are summarized as below:

- The trend of future earning of most of the insurance companies is found satisfactory except NICL and EICL.
- The insurance companies are being disabled to explore the area of investment in high income generation sector like short term investment, debenture of other company except HGICL.
- The area of investment of insurance is found much tapered likes all eggs are in same basket.
- Expected return, S.D., and C.V. of Banks are as below

Company	$\bar{R}$	**S.D.**	**C.V.**	**Remark**
HGICL	0.14	0.27	6.17	
UICNL	0.28	0.29	1.03	Moderate Return and S.D
PICNL	1.62	3.3	2.03	Highest Standard Deviation & Return
NICL	0.0016	0.1113	69.59	Highest C.V.
EICL	-0.04	.114	-2.85	Lowest Return

- Expected Return S.D. C.V. Expected Return and risk (Standard Deviation) are found to be high in Hydropower Industry, Expected rate of return is 140% and Standard Deviation is 292.5%. Expected Return and risk on Trading Industry is low.
- Systematic risk, of the different companies under study is as below:

Company	**Beta**	**Remarks**
Himalayan General	0.67	
United Insurance	0.63	
Premier Insurance	0.82	High Beta
Nepal Insurance	-0.20	Low Beta
Everest Insurance	0.03	

- Most of the companies under study are underpriced but NICL & EICL are over price
- Systematic risk and unsystematic risk of companies are as follow

Company	Beta	S.D	Systematic Risk	Unsystematic Risk
HGICL	0.67	0.27	0.1158	-0.04
UICNL	0.63	0.29	0.102	-0.0164
PICNL	0.82	3.3	0.1734	-10.69
NICL	-0.20	0.1113	0.010	0.22
EICNL	0.02	.114	0.00023	0.012

- While creating portfolio between UICNL and EICL, expected return is very high, 25.47% and their weight is 0.91 and 0.09 respectively. Borrowing from the EICNL and investing in PICNL is found to be of profitable to an investor.
- Optimal portfolio will be investing wealth as below:

Companies	Weight of Investment(%)
HGICL	65.04
UICNL	127.17
PICNL	151.21
NICL	21.98
EICL	-265.4

- Expected return and S.D. of optimal portfolio is 48.25% and 93.9% respectively.
- The insurance companies seems not wanting to make a risk in their investment
- out of Insurance company, this study found that high return in hydropower sector as well as risk is found.

CHAPTER- V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter deals with the findings and conclusions derived from the study of above study. This chapter consists of three sections: the first section provides the summary of the study, the second section draws the conclusions of the study and the final section gives recommendations to the problem observed on the basis of the findings.

5.1 Summary

The relationship between risk and return described by investor's perception about risk and their demand for compensation. No investor will like to invest in risky assets unless he is assured of adequate compensation for the acceptance of risk. Hence, risk plays a central role in the analysis of investment. A rational investor always seeks to find the optimal portfolio so that this will reduce risk in his/her investment. Investors often ask about the total risk they will be assuming an investment and like to know if the risk premium provided is enough. Higher risk gives higher premium and the tradeoff between the two assumes a linear relationship between risk and risk premium.

Five samples are taken among 20 listed insurance companies to analyze the risk, return and portfolio analysis in common stock investment. During the research work, a brief review of literature has been conducted. Mathematical and financial tools are used in data analysis. Tables, graphs and diagrams are used to present the data and results. Secondary data are collected from the NEPSE, NRB, and related companies.

Major problem faced by investors is inability to create an optimal portfolio, that's why investors lose their huge money in the share market. Major objective of this research work is to project an optimal portfolio in CS investment among the CS of insurance companies of Nepal. For the study,

only 5 years data are used. Books, Journals, and Masters research works are reviewed for the research purpose. Very limited articles about Nepalese capital market are found. The major research gap found about the estimation of an optimal portfolio between more than two assets.

This study covers sample of 5 different insurance companies among the population of 20 companies. Secondary data are analyzed during the study. Secondary data from various sources i.e. website of Insurance Companies,SEBO/N, NEPSE, NRB, Books and Annual reports published by SEBO/N, NEPSE and insurance companies are analyzed. Shareholders of Nepal Insurance Co. Ltd. found to be high i.e. 9774 among the taken sample companies. Par value of all insurance companies (sample companies) equal as Rs. 100. Expected Rate of Return, Standard Deviation, Co-efficient of variation and beta co-efficient of individual insurance companies are calculated. Portfolio risk return and risk between companies are calculated. Sector wise risk return and beta co-efficient are also calculated. Correlation co-efficient between companies is also calculated. Stock market investment is considered as a gambling. Many people have unrealistically optimistic or pessimistic expectations about stock market investment or perhaps just a fear of the unknown. This study enables investors to put the returns they can expect and the risk they may take into better perspective. Nepalese stock market is in emerging stage. It is developed in accelerating since the political change in 1990 is effect of openness and liberalization in national economy. But, due to the lack of knowledge and required information, Nepalese private investors are unable to analyze the securities as well as market prosperity.

CAPM describes the relationship between risk and equilibrium return. In this model, risk free rate plus a premium based on systematic risk of the security is equilibrium rate of return of the stock. Comparing expected rate of return and equilibrium rate of return, insurance company are overpriced. This implies

there is chance of increase of stock value in near future, so investor can purchase the CS of any insurance companies.

Using Markowitz simple diversification, risk could be diversified on investing in two or more assets. While creating portfolio between UICNL and EICL, expected return is very high, 25.47% and their weight is 0.91 and 0.09 respectively. Borrowing from the PICNL and investing in EICL is found to be of profitable to an investor. Before diversification, risk of these companies was 29 and 11.4 respectively.

5.2 Conclusion

From above study, the return is the income received on a stock investment, which is unusually expressed in percentage. Expected return on CS of PICNL is maximum (i.e. 162%). This high return is due to stock dividend in the year 2006/07and consistent cash dividend given to its shareholders. Expected return of EICL is minimum (i.e. -4%).

Standard deviation measures the unsystematic risk, which is not defined by the market so NICL's unsystematic risk is very high (i.e. 0.22). Unsystematic risk of PICNL is found to be of very low (i.e. -10.69). Beta measures the systematic risk. PICNL has highest systematic risk (i.e. ß=0.82) and the lowest systematic risk is of NICL i.e.ß= -20. All Investing in the stock will be the aggressive type of investment due to exceed of beta Less than 1 and so all are defensive type of investment.

Correlation co-efficient between NICL and HGICL is very low i.e. -0.75 and correlation between HGICL and UICNL is very high i.e. 0.41. On creating the portfolio of multiple assets, an investor should invest 21.98% of the total wealth in CS of NICL, 65.04% of the total wealth in CS of HGICL, 151.21% of total wealth should be invested in PICNL, 127.17% of total wealth in

UICNL and should borrow -265.4 of from EICNL to earn the 48.25, the investor should bear the risk of 93.9%.

5.3 Recommendations

Following recommendations are forwarded on the basis of the research work. The recommendations are presented separately for investors and institutions

1. Investors

To beat the stock market, proper analysis of individual security, industry and overall market is always required. This is proved by present political situation and declining of NEPSE index. An investor should buy securities when market is rising (NEPSE index) and sell securities when market performance is falling, hold securities, which are performing better than the market.

Investor should invest in CS of NICL so that investor could easily forecast rising or falling of his/her wealth position with respect to the market return since systematic risk of the NICL is high. Higher the risk, higher the return.
In case of portfolio construction among many assets, it is recommended to invest in the assets whose correlation is negative since there will be more reduction of risk. Higher the coefficient of correlation, less degree of risk is reduced.

2. Institutions

NEPSE being a major operative body in the area of secondary market should keep on developing the different parameters related to the congenial functioning of the stock market. It needs to get into the modernization and further to this it needs to develop efficient and effective channels of information related to investment in companies listed.

Securities Exchange Board/ Nepal being the apex body in our nation for the regulation and development of capital market, it should initiate research and development program, seminars, workshops, training program etc. in interval

of time. It should be stricter regarding rules and regulation in securities trading. SEBO/N seems to be more flexible towards corporations.

In order to develop the healthy economic system in the country government should be keeping devising and issuing rules and regulation regarding the operation of stock market.GON needs to manage government securities trading from NEPSE trading floor. Government needs to amend of rules and regulations regarding stock trading time to time. Political stability is must for the economic prosperity and increasing trend of business.

3. For Future Scope

Future generation can use the other various tools

- Tools : this study use only financial tool, so future person can use other statistical and other new arriving tools like hypothesis, correlation and regression and probabilities etc
- Samples : among 20 insurance companies, in this study only 5 samples are taken, the future generation can take more than 5 sample which helps more reliable results
- Years : in this study only 5 years data are taken, next generation may use more than 5 years data that help to find out actual results
- Segregation : this study doesn't segregate the life and non life insurance, companies are taken only base on data available basis so next generation can choose only either life or non life insurance also

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Annex-1

Calculation of Beta Coefficient of Himalayan General Insurance Company Ltd.

Calculation of Covariance Between Himalayan General Insurance Company Ltd &Market.

F/Y	R_H	R_M	$R_H-\bar{R}_H$	$R_M-\bar{R}_M$	$(R_H-\bar{R}_H)(R_M-\bar{R}_M)$
03/004	-			0	0
04/005	0.1714286	0.29	0.030428571	-0.069	-0.0021
05/006	0.0780488	0.047	-0.21904878	-0.312	0.06843
06/007	0.6184651	1.28	0.47746508	0.9206	0.43955
07/008	0.1675333	0.4	0.026533333	0.0406	0.00108
08/009	-0.173913	-0.22	-0.31491304	-0.579	0.18246
Total	0.70547	1.797			0.689

$Expected\ Return\ (\bar{R}\mathrm{m}) = \frac{\Sigma Rm}{N-1}$ = 1.797/5 =0.3594

$Expected\ Return\ (\bar{R}\mathrm{H}\ ) = \frac{\Sigma RH}{N-1}$ = 0.705/5 = 0.141

$\sigma_M^2 = \frac{(R_M - \bar{R}_M)^2}{N-1}$

=1.29/5= 0.258

COV (R_H, R_M) = $\Sigma\frac{(R_H - \bar{R}_H)(R_M - \bar{R}_M)}{N-1}$

=0.69/4=0.1725

Now,

$\beta_H = \frac{COV(R_H, R_M)}{\sigma_M^2}$

= 0.1725**/0.258=0.67**

Annex-2

Calculation of Beta Coefficient of United Insurance Company (Nepal) Ltd.

Calculation of Covariance Between United Insurance Company (Nepal) Ltd & Market.

F/Y	**R_U**	**R_M**	**$R_U - \bar{R}_U$**	**$R_M - \bar{R}_M$**	**$(R_U - \bar{R}_U)(R_M - \bar{R}_M)$**
03/004	0				0
04/005	-0.029	0.29	-0.309	-0.069	0.02144
05/006	0.23	0.047	-0.05	-0.312	0.01562
06/007	0.76	1.28	0.48	0.9206	0.44189
07/008	0.43	0.4	0.15	0.0406	0.00609
08/009	0.0031	-0.22	-0.2769	-0.579	0.16044
Total	1.4	1.797			0.645

$Expected\ Return\ (\bar{R}\mathrm{m}) = \frac{\Sigma Rm}{N-1}$ = 1.79/5 =0.3594

$Expected\ Return\ (\bar{R}\mathrm{U}) = \frac{\Sigma RU}{N-1}$ = 1.4/5 = 0.28

$\sigma_M^2 = \frac{(R_M - \bar{R}_M)^2}{N-1}$

=1.29/5= 0.258

$COV(R_U, R_M) = \Sigma \frac{(R_U - \bar{R}_U)(R_M - \bar{R}_M)}{N-1}$

=0.65/4=0.1625

Now,

$\beta_U = \frac{COV(R_U, R_M)}{\sigma_M^2}$

= 0.1625**/ 0.258 =0.63**

Annex-3

Calculation of Beta Coefficient of Premier Insurance Company(Nepal) Ltd

Calculation of Covariance Between Premier Insurance Company (Nepal) Ltd &Market

F/Y	**R_p**	**R_M**	**$R_p - \bar{R}_p$**	**$R_M - \bar{R}_M$**	**$(R_p - \bar{R}_p)(R_M - \bar{R}_M)$**

03/004	-			0	0
04/005	**0**	0.29	-1.62	-0.069	0.11243
05/006	**-0.048**	0.047	-1.668	-0.312	0.52108
06/007	**0.3**	1.28	-1.32	0.9206	-1.2152
07/008	**8.22**	0.4	6.6	0.0406	0.26796
08/009	**-0.37**	-0.22	-1.99	-0.579	1.15301
Total	8.102	1.797			0.839

$Expected\ Return\ (\bar{R}\mathrm{m}) = \frac{\Sigma Rm}{N-1}$ = 1.79/5 =0.3594

$Expected\ Return\ (\bar{R}\mathrm{p}) = \frac{\Sigma Rp}{N-1}$ = 0.8.10/5 = 0.178

$\sigma_M^2 = \frac{(R_M - \bar{R}_M)^2}{N-1}$

=1.29/5= 0.258

$COV\ (R_p, R_M) = \Sigma\frac{(R_p - \bar{R}_p)(R_M - \bar{R}_M)}{N-1}$

=0.84/4=0.21

Now,

$\beta_p = \frac{COV_{(}R_p, R_{M)}}{\sigma_M^2}$

=0.21/258=0.814

Annex 4

Calculation of Beta Coefficient of Nepal Insurance Company Ltd

Calculation of Covariance between Nepal Insurance Company Ltd &Market

F/Y	R_N	R_M	$R_N-\bar{R}_N$	$R_M-\bar{R}_M$	$(R_N-\bar{R}_N)(R_M-\bar{R}_M)$
03/004	-			0	0
04/005	0.0933333	0.29	-0.09503333	-0.069	0.0066
05/006	0.1911765	0.047	0.189476471	-0.312	-0.0592
06/007	0.1185185	1.28	-0.12021852	0.9206	-0.1107
07/008	0.0196078	0.4	-0.02130784	0.0406	-0.0009
08/009	0.0485714	-0.22	0.046871429	-0.579	-0.0272
Total	0.00829	1.797			-0.19

$Expected\ Return\ (\bar{R}\mathrm{m}) = \frac{\Sigma Rm}{N-1}$ = 1.79/5 =0.3594

$Expected\ Return\ (\bar{R}\mathrm{N}) = \frac{\Sigma RN}{N-1}$ = 0.00829/5 = 0.001658

$\sigma_M^2 = \frac{(R_M-\bar{R}_M)^2}{N-1}$

=1.29/5= 0.258

$COV(R_N, R_M) = \Sigma\frac{(R_N-\bar{R}_N)(R_M-\bar{R}_M)}{N-1}$

=-0.2/4= -0.05

Now,

$\beta_N = \frac{COV(R_N, R_M)}{}$

σ_M^2

= -0.05/258= -0.1938

Annex 5

Calculation of Beta Coefficient of Everest Insurance Company Ltd

Calculation of Covariance Between Everest Insurance Company Ltd &Market

F/Y	R_E	R_M	$R_E-\bar{R}_E$	$R_M-\bar{R}_M$	$(R_E-\bar{R}_E)(R_M-\bar{R}_M)$
03/004	-			0	0
04/005	0.0714286	0.29	-0.03142857	-0.069	0.00218
05/006	0.0923077	0.047	-0.05230769	-0.312	0.01634
06/007	0.0169492	1.28	0.02305085	0.9206	0.02122
07/008	0.0034483	0.4	0.043448276	0.0406	0.00176
08/009	0.0206186	-0.22	0.01938144	-0.579	-0.0112
Total	-0.1979	1.797			0.03

$Expected\ Return\ (\bar{R}\mathrm{m}) = \frac{\Sigma Rm}{N-1}$ = 1.79/5 =0.3594

$Expected\ Return\ (\bar{R}\mathrm{E}) = \frac{\Sigma RE}{N-1}$ = -0.2 /5 = -0.04

$\sigma_M^2 = \frac{(R_M-\bar{R}_M)^2}{N-1}$

=1.29/5= 0.258

$COV(R_E, R_M) = \frac{\Sigma(R_E-\bar{R}_E)(R_M-\bar{R}_M)}{N-1}$

=0.03/4=0.0075

Now,

$\beta_E = \frac{COV(R_E, R_M)}{\sigma_M^2}$

= 0.0075/258= 0.29

Annex 6

Partitioning of Total Risk of Individual Company

We have,

Total Risk = Systematic risk + Unsystematic risk

σ^2 = $\beta^2\sigma_M^2$ + unsystematic risk

so,

Unsystematic risk = σ^2-$\beta^2\sigma m^2$

Where,

σ^2 =total variance of individual company

β = Beta sensitivity to the market of Individual company

σ_M^2 = total market variance

For Himalayan General Insurance Co. Ltd.

Unsystematic Risk =0.076-$(0.67)^2$*0.258

-0.03982

Systematic risk = $(0.67)^2$ *0.258

= 0.1158

For United Insurance Co.(Nepal) Ltd.

Unsystematic Risk =0.086- $(0.63)^2$*0.258

-0.0164

Systematic risk = $(0.63)^2$*0.258

= 0.102

For Premier Insurance Co.(Nepal) Ltd.

Unsystematic Risk =10.91- $(0.82)^2$*0.258

-10.69

Systematic risk = $(0.82)^2$*0.258

= 0.1734

For Nepal Insurance Company Ltd

Unsystematic Risk =0.01240- $(-0.2)^2$*0.258

0.22

Systematic risk = $(-0.2)^2$*0.258

= 0.010

For Everest Insurance Co.(Nepal) Ltd

Unsystematic Risk =0.013- $(0.030)^2$*0.258

0.012

Systematic risk = $(0.82)^2$*0.258

= 0.00023

Annex 7

Calculation of Return, S.D, Expected Return and C.V of Commercial Banking Industry

Year	NEPSE Index	$RB = \frac{(NI_t - NI_{t-1})}{NI_{t-1}}$	R-$\bar{R}$	(R-$\bar{R}$)²
2002/03	100	0	0	0

2003/04	199.33	0.9933	0.47136	0.22218
2004/05	232.87	0.168264	-0.45804	0.2098
2005/06	437.49	0.878688	0.252388	0.0637
2006/07	439.67	0.004983	-0.62132	0.38603
2007/08	804.26	0.829236	0.202936	0.04118
2008/09	1011.09	0.257168	-0.36913	0.13626
	Total	3.131638		1.05915

Expected Return ($\bar{R}$) = ΣR/n = 3.13/6= 0.522

Standard Deviation (σ) $= \sqrt{\frac{\Sigma(R-R)2}{N-1}} = \sqrt{\frac{1.06}{6}} = 0.4604$

Co-efficient of Variation (C.V.) = $\sigma/\bar{R}$ = 0.46043/0.522 = 0.8820

Annex-8

Calculation of Return, S.D, Expected Return and C.V of Manfg. & Processing Industry

Year	NEPSE Index	$RM = \frac{(NI_t - NI_{t-1})}{NI_{t-1}}$	R-$\bar{R}$	(R-$\bar{R}$)²
2002/03	100			
2003/04	250.13	1.5013	1.1556	1.34
2004/05	255.58	0.021789	-0.32391	0.1049
2005/06	301.11	0.178144	-0.16756	0.028
2006/07	301.62	0.001694	-0.34401	0.1184
2007/08	348.63	0.155858	-0.18984	0.036
2008/09	423.66	0.215214	-0.13049	0.017
	Total	2.073998		1.6443

Expected Return ($\bar{R}$) = ΣR/n = 2.073998/6 = 0.345666

Standard Deviation (σ) $= \sqrt{\frac{\Sigma(R-R)2}{N-1}} = \sqrt{\frac{1.64}{5}} = 0.5734$

Co-efficient of Variation (C.V.) = σ/$\bar{R}$ = 0.5734/0.3457 = 1.6587

Annex- 9

Calculation of Return, S.D,Expected Return and C.V of Hotel Industry

Year	NEPSE Index	$RH = \frac{(NI_t - NI_{t-1})}{NI_{t-1}}$	R-$\bar{R}$	(R-$\bar{R}$)²
2002/03	100			
2003/04	196.68	0.9668	0.6823	0.46553
2004/05	184.98	-0.05949	-0.34399	0.11833
2005/06	180.77	-0.02276	-0.30726	0.09441
2006/07	180.77	0	-0.2845	0.08094
2007/08	251.47	0.391105	0.106605	0.01136

2008/09	360.15	0.432179	0.147679	0.02181
	Total	1.707837		0.79238

Expected Return ($\bar{R}$) = ΣR/n = 1.7078/6 = 0.2845

Standard Deviation (σ) $= \sqrt{\frac{\Sigma(R-R)2}{N-1}} = \sqrt{\frac{0.79238}{5}} = 0.3981$

Co-efficient of Variation (C.V.) = σ/$\bar{R}$ = 0.3981/0.2845 = 1.4

Annex-10

Calculation of Return, S.D, Expected Return and C.V of Other Industry

Year	NEPSE Index	$Ro = \frac{(NI_t - NI_{t-1})}{NI_{t-1}}$	R-$\bar{R}$	(R-$\bar{R}$)²
2002/03	100			
2003/04	48.56	-0.5144	-1.22065	1.48999
2004/05	142.65	1.937603	1.231353	1.51623
2005/06	410	1.874168	1.167918	1.36403
2006/07	408.14	-0.00454	-0.71079	0.50522
2007/08	818.12	1.004508	0.298258	0.08896
2008/09	769.21	-0.05978	-0.76603	0.58681
	Total	4.237559		5.55123

Expected Return ($\bar{R}$) = ΣR/n = 4.2375/6 = 0.7062

Standard Deviation (σ) $= \sqrt{\frac{\Sigma(R-R)2}{N-1}} = \sqrt{\frac{5.55}{5}} = 1.05$

Co-efficient of Variation (C.V.) = σ/$\bar{R}$ = 1.05/0.3457 = 1.49

Annex-11

Calculation of Return, S.D,Expected Return and C.V of Trading Industry

Year	NEPSE Index	$RT = \frac{(NI_t - NI_{t-1})}{NI_{t-1}}$	R-$\bar{R}$	(R-$\bar{R}$)²
2002/03	100			
2003/04	94.56	-0.0544	-0.19815	0.03926
2004/05	95.01	0.004759	-0.13899	0.01932
2005/06	148.11	0.558889	0.415139	0.17234
2006/07	148.11	0	-0.14375	0.02066
2007/08	162.19	0.095064	-0.04869	0.00237
2008/09	204.08	0.258277	0.114527	0.01312
	Total	0.862589		0.26707

Expected Return ($\bar{R}$) = ΣR/n = 0.866/6 = 0.1437

Standard Deviation (σ) = $\sqrt{\frac{\Sigma(R-R)2}{N-1}}$ = $\sqrt{\frac{0.27}{5}}$ = 0.2323

Co-efficient of Variation (C.V.) = σ/$\bar{R}$ = 0.2323/0.1437 = 1.616

Annex-12

Calculation of Return, S.D, Expected Return and C.V of Insurance Industry

Year	NEPSE Index	$RI = \frac{(NI_t - NI_{t-1})}{NI_{t-1}}$	R-$\bar{R}$	(R-$\bar{R}$)²
2002/03	100			
2003/04	240.64	1.4064	0.91575	0.8386
2004/05	237.39	-0.01351	-0.50416	0.25417
2005/06	381.25	0.606007	0.115357	0.01331
2006/07	382.42	0.003069	-0.48758	0.23774
2007/08	616.26	0.611474	0.120824	0.0146
2008/09	819.94	0.33051	-0.16014	0.02564
	Total	2.943954		1.38406

Expected Return ($\bar{R}$) = ΣR/n = 2.944/6 = 0.49065

Standard Deviation (σ) $= \sqrt{\frac{\Sigma(R-R)2}{N-1}} = \sqrt{\frac{1.384}{5}} = 0.5253$

Co-efficient of Variation (C.V.) = $\sigma/\bar{R}$ = 0.5253/0.49065 = 1.6587

Annex-13

Calculation of Return, S.D, Expected Return and C.V of Finance Industry

Year	NEPSE Index	$RF = \frac{(NI_t - NI_{t-1})}{NI_{t-1}}$	R-$\bar{R}$	(R-$\bar{R}$)²
2002/03	100			
2003/04	207.93	1.0793	0.47655	0.2271
2004/05	196.32	-0.05584	-0.65859	0.43374
2005/06	261.37	0.331347	-0.2714	0.07366
2006/07	261.46	0.000344	-0.60241	0.36289
2007/08	471.79	0.804444	0.201694	0.04068
2008/09	1159.18	1.456983	0.854233	0.72971
	Total	3.616582		1.86778

Expected Return ($\bar{R}$) = ΣR/n = 3.6165/6 = 0.60275

Standard Deviation (σ) $= \sqrt{\frac{\Sigma(R-R)2}{N-1}} = \sqrt{\frac{1.86778}{5}} = 0.6112$

Co-efficient of Variation (C.V.) = $\sigma/\bar{R}$ = 0.6112/0.60275= 1.01

Annex-14

Calculation of Return, S.D, Expected Return and C.V of Development Banking Industry

Year	NEPSE Index	$RD = \frac{(NI_t - NI_{t-1})}{NI_{t-1}}$	R-$\bar{R}$	(R-$\bar{R}$)²
2002/03	100			
2003/04	247.49	1.4749	0.7891	0.62268
2004/05	190.03	-0.23217	-0.91797	0.84267

2005/06	294.4	0.549229	-0.13657	0.01865
2006/07	294.4	0	-0.6858	0.47032
2007/08	543.58	0.846399	0.160599	0.02579
2008/09	1346.36	1.476839	0.791039	0.62574
	Total	4.115196		2.60586

Expected Return ($\bar{R}$) = ΣR/n = 4.115196/6 = 0.6858

Standard Deviation (σ) $= \sqrt{\frac{\Sigma(R-R)2}{N-1}} = \sqrt{\frac{2.606}{5}} = 0.72194$

Co-efficient of Variation (C.V.) = σ/$\bar{R}$ = 0.7219/0.6858 = 1.052

Annex-15

Calculation of Return, S.D, Expected Return and C.V of Hydro Power Industry

Year	NEPSE Index	$RHP = \frac{(NI_t - NI_{t-1})}{NI_{t-1}}$	R-$\bar{R}$	(R-$\bar{R}$)²
2002/03	100			
2003/04			0	0
2004/05			0	0
2005/06			0	0
2006/07	100		0	0
2007/08	886.81	7.8681	6.4771	41.9528
2008/09	1311.43	0.478817	-0.91218	0.83208
	Total	8.346917		42.7849

Expected Return ($\bar{R}$) = ΣR/n = 8.3469/6 = 1.4

Standard Deviation (σ) $= \sqrt{\frac{\Sigma(R-R)2}{N-1}} = \sqrt{\frac{42.78}{5}} = 2.925$

Co-efficient of Variation (C.V.) = σ/$\bar{R}$ = 2.925/1.4 = 2.10

Annex-16

Calculation of Covariance between Himalayan Insurance & United Insurance & their weight Portfolio, Risk & Return

F/Y	$(R_A-\bar{R}_A)$	$(R_B-\bar{R}_B)$	$(R_A-\bar{R}_A)(R_B-\bar{R}_B)$
2003/04	-	-0.0875	0
2004/05	-0.021	-0.0875	0.001838
2005/06	0.2	-0.06845	-0.01369
2006/07	-0.47	0.127453	-0.059903
2007/08	0.18	0.066346	0.011942
2008/09	-0.06	-0.0275	0.00165
Total			-0.058

We Have,

$$COV(R_A, R_B) = \frac{\Sigma (R_A-\bar{R}_A)(R_B-\bar{R}_B)}{n} = -0.058/5 = -0.012$$

$$WA = \frac{\sigma_B^2 - COV(R_A, R_B)}{\sigma_A^2+\sigma_B^2 - 2cov(R_A, R_B)}$$

$$WA = \frac{(0.29)^2 - COV(-0.012)}{(0.2490)^2+(0.29)^2 - 2(-0.012)} = 0.096/.17 = 0.56$$

WB = 1-056 = 0.44

Portfolio Return & Standard Deviation of HGICL & UICNL

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

=0.178*0.56+0.28*.44

= 22.28

$\sigma_P = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2W_A W_B \, COV(R_A, R_B)}$

$\sigma_P = \sqrt{(0.56)^2 (0.2490)^2 + (0.44)^2 (0.29)^2 + 2(0.56)*(0.44) (-0.012)}$

= 0.4525

Annex- 17

Calculation of Covariance between Himalayan Insurance & Premier Insurance & their weight portfolio, Risk & Return

F/Y	$(R_A-\bar{R}_A)$	$(R_B-\bar{R}_B)$	$(R_A-\bar{R}_A)(R_B-\bar{R}_B)$
2003/04	-	-	0
2004/05	-0.021	**-0.21**	0.00441
2005/06	0.2	**-0.25762**	-0.051524
2006/07	-0.47	**0.09**	-0.0423
2007/08	0.18	**-0.03388**	-0.006098
2008/09	-0.06	**0.368947**	-0.022137
	Total		-0.1177

We Have,

$$COV(R_A, R_B) = \frac{\Sigma (R_A-\bar{R}_A)(R_B-\bar{R}_B)}{n} = -0.1177/5 = -0.023$$

$$WA = \frac{\sigma_B^2 - COV(R_A, R_B)}{\sigma_A^2+\sigma_B^2 - 2cov(R_A, R_B)}$$

$$WA = \frac{(0.2261)^2 - COV(-0.023)}{(0.2490)^2+(0.2261)^2 - 2(-0.023)} = 0.074/.1591 = 0.47$$

WB = 1-0.47 = 0.53

Portfolio Return & Standard Deviation of HGICL & PICNL

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

=0.178*0.47+0.20*.53

= 18.96

$\sigma_P = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2W_A W_B COV(R_A,R_B)}$

$\sigma_P = \sqrt{(0.47)^2 (0.2490)^2 + (0.53)^2 (0.2261)^2 + 2(0.47)*(0.53) (-0.023)}$

= 0.1284

Annex-18

Calculation of Covariance between United Insurance & Premier Insurance & their weight portfolio, Risk & Return

F/Y	$(R_A-\bar{R}_A)$	$(R_B-\bar{R}_B)$	$(R_A-\bar{R}_A)(R_B-\bar{R}_B)$
2003/04	-0.0875	-	0
2004/05	-0.0875	**-0.21**	0.018375
2005/06	-0.06845	**-0.25762**	0.0176341
2006/07	0.127453	**0.09**	0.0114708
2007/08	0.066346	**-0.03388**	-0.0022478
2008/09	-0.0275	**0.368947**	-0.010146
	Total		0.035

We Have,

$COV(R_A, R_B) = \frac{\Sigma (R_A-\bar{R}_A)(R_B-\bar{R}_B)}{n}$ = 0.035/5 = 0.007

$WA = \frac{\sigma_B^2 - COV(R_A, R_B)}{\sigma_A^2+\sigma_B^2 - 2cov(R_A, R_B)}$

$$W_A = \frac{(0.2261)^2 - COV\ (0.007)}{(0.29)^2 + (0.2261)^2 - 2\ (0.007)} = 0.04412/0.12. = 0.37$$

WB = 1-0.37 = 0.63

Portfolio Return & Standard Deviation of UICNL & PICNL

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

=0.28*0.37+0.20*.63

= 13.96

$\sigma_P = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2W_A W_B COV(R_A, R_B)}$

$\sigma_P = \sqrt{(0.37)^2 (0.29)^2 + (0.63)^2 (0.2261)^2 + 2(0.37)*(0.63)\ (0.007)}$

= 0.1870

Annex-19

Calculation of covariance between Himalayan Insurance & Nepal Insurance & their weight portfolio, Risk & Return

F/Y	$(R_A - \bar{R}_A)$	$(R_B - \bar{R}_B)$	$(R_A - \bar{R}_A)(R_B - \bar{R}_B)$
2003/04			0
2004/05	0.030429	-0.09499	-0.00289045
2005/06	-0.21905	0.189516	-0.04151348
2006/07	0.476937	-0.12018	-0.05731829
2007/08	0.026533	-0.02127	-0.00056436

2008/09	-0.31491	0.046911	-0.01477274
		Total	-0.1170

We Have,

$COV(R_A, R_B) = \frac{\Sigma (R_A - \bar{R}_A)(R_B - \bar{R}_B)}{n}$ = -0.1170/5 = -0.023

$WA = \frac{\sigma_B^2 - COV(R_A, R_B)}{\sigma_A^2 + \sigma_B^2 - 2cov(R_A, R_B)}$

$WA = \frac{(0.1113)^2 - COV(-0.023)}{(0.27)^2 + (0.1113)^2 - 2(-0.023)}$ =0.03539/.1314 = 0.27

WB = 1-0.27 = 0.73

<u>Portfolio Return & Standard Deviation of HGICL & NICNL</u>

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

=0.141*0.27+0.0016*.73

= 3.91

$\sigma_P = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2W_A W_B COV(R_A, R_B)}$

$\sigma_P = \sqrt{(0.27)^2 (0.27)^2 + (0.73)^2 (0.113)^2 + 2(0.27)*(0.73)(-0.023)}$

= 0.4496

Annex-20

Calculation of Covariance between Himalayan Insurance & Everest Insurance & their weight Portfolio, Risk & Return

F/Y	$(R_A-\bar{R}_A)$	$(R_B-\bar{R}_B)$	$(R_A-\bar{R}_A)(R_B-\bar{R}_B)$
2003/04			0
2004/05	0.030429	-0.03143	-0.00095638
2005/06	-0.21905	-0.05231	0.011458506
2006/07	0.476937	0.023051	0.010993875
2007/08	0.026533	0.043448	0.001152806
2008/09	-0.31491	0.019381	-0.00610327
		Total	0.017

We Have,

$$COV(R_A, R_B) = \frac{\Sigma (R_A-\bar{R}_A)(R_B-\bar{R}_B)}{n} = 0.017/5 = 0.0034$$

$$WA = \frac{\sigma_B^2 - COV(R_A, R_B)}{\sigma_A^2+\sigma_B^2 - 2cov(R_A, R_B)}$$

$$WA = \frac{(0.114)^2 - COV(0.0034)}{(0.27)^2+(0.114)^2 - 2(0.0034)} = 0.03539/.1314 = 0.12$$

WB = 1-0.12 = 0.88

Portfolio Return & Standard Deviation of HGICL & EICNL

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

=0.141*0.12+(-0.04)*0.88

$= -1.83$

$$\sigma_P = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2W_A W_B \, COV(R_A, R_B)}$$

$$\sigma_P = \sqrt{(0.12)^2 (0.27)^2 + (0.88)^2 (0.114)^2 + 2(0.12)*(0.88) (0.0034)}$$

$= 0.1350$

Annex-21

Calculation of Covariance between United Insurance & Everest Insurance & their weight portfolio, Risk & Return

F/Y	**$(R_A-\bar{R}_A)$**	**$(R_B-\bar{R}_B)$**	**$(R_A-\bar{R}_A)(R_B-\bar{R}_B)$**
2003/04	-		0
2004/05	-0.30857	-0.03143	0.009698355
2005/06	-0.05451	-0.05231	0.002851418
2006/07	0.4816	0.023051	0.011101362
2007/08	0.15379	0.043448	0.006681868
2008/09	-0.27682	0.019381	-0.00536505
		Total	0.025

We Have,

$COV(R_A, R_B) = \frac{\Sigma (R_A-\bar{R}_A)(R_B-\bar{R}_B)}{n}$ = 0.025/5 = 0.005

$WA = \frac{\sigma_B^2 - COV(R_A, R_B)}{\sigma_A^2+\sigma_B^2 - 2cov(R_A, R_B)}$

$WA = \frac{(0.114)^2 - COV(0.005)}{(0.29)^2+(0.114)^2 - 2(0.005)}$ =0.081/0.0871 = 0.91

WB = 1-0.12 = 0.09

Portfolio Return & Standard Deviation of UICNL & EICNL

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

=0.28*0.91+ (-0.04)*0.09

= 25.47

$\sigma_P = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2W_A W_B \, COV(R_A, R_B)}$

$\sigma_P = \sqrt{(0.91)^2 (0.29)^2 + (0.09)^2 (0.114)^2 + 2(0.91)*(0.09) (0.005)}$

= 0.27

Annex-22

Calculation of Covariance between United Insurance & Nepal Insurance & their weight portfolio, Risk & Return

F/Y	$(R_A-\bar{R}_A)$	$(R_B-\bar{R}_B)$	$(R_A-\bar{R}_A)(R_B-\bar{R}_B)$
2003/04	-		0
2004/05	-0.30857	-0.09499	0.029311064
2005/06	-0.05451	0.189516	-0.01033052
2006/07	0.4816	-0.12018	-0.05787869
2007/08	0.15379	-0.02127	-0.00327111
2008/09	-0.27682	0.046911	-0.0129859
		Total	-0.055

We Have,

$COV(R_A, R_B) = \frac{\Sigma (R_A-\bar{R}_A)(R_B-\bar{R}_B)}{n}$ = -0.055/5 = -0.011

$WA = \frac{\sigma_B^2 - COV(R_A, R_B)}{\sigma_A^2+\sigma_B^2 - 2cov(R_A, R_B)}$

$WA = \frac{(0.1113)^2 - COV(-0.011)}{(0.29)^2+(0.1113)^2 - 2(-0.011)}$ =0.0234/0.001184 = 0.20

WB = 1-0.27 = 0.80

Portfolio Return & Standard Deviation of UICNL & NICNL

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

=0.28*0.20+0.0016*.80

= 5.72

$\sigma_P = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2W_A W_B COV(R_A,R_B)}$

$\sigma_P = \sqrt{(0.20)^2 (0.29)^2 + (0.80)^2 (0.113)^2 + 2(0.20)*(0.80) (-0.011)}$

= 0.090

Annex-23

Calculation of Covariance between Premier Insurance & Nepal Insurance & their weight portfolio, Risk & Return

F/Y	$(R_A-\bar{R}_A)$	$(R_B-\bar{R}_B)$	$(R_A-\bar{R}_A)(R_B-\bar{R}_B)$
2003/04			0
2004/05	-1.62	-0.09499	0.1538838
2005/06	-1.66762	0.189516	-0.31604067
2006/07	-1.32	-0.12018	0.1586376
2007/08	6.594615	-0.02127	-0.14026746
2008/09	-1.98667	0.046911	-0.09319668
		Total	-0.24

We Have,

$COV(R_A, R_B) = \frac{\Sigma (R_A-\bar{R}_A)(R_B-\bar{R}_B)}{n}$ = -0.24/5 = -0.048

$WA = \frac{\sigma_B^2 - COV(R_A, R_B)}{\sigma_A^2+\sigma_B^2 - 2cov(R_A, R_B)}$

$$W_A = \frac{(0.1113)^2 - COV(-0.048)}{(3.3)^2 + (0.1113)^2 - 2(-0.048)} = 0.061/10.99 = 0.0055$$

$W_B = 1-0.27 = 0.9945$

Portfolio Return & Standard Deviation of PICNL & NICL

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

$= 1.62*0.0055+0.0016*.9945$

$= 1.05$

$\sigma_P = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2W_A W_B COV(R_A, R_B)}$

$\sigma_P = \sqrt{(0.0055)^2 (3.3)^2 + (0.9945)^2 (0.113)^2 + 2(0.0055)*(0.9945)(-0.048)}$

$= 0.2114$

Annex -24

Calculation of Covariance between Premier Insurance & Everest Insurance & their weight portfolio, Risk & Return

F/Y	$(R_A-\bar{R}_A)$	$(R_B-\bar{R}_B)$	$(R_A-\bar{R}_A)(R_B-\bar{R}_B)$
2003/04			0
2004/05	-1.62	-0.03143	0.0509166
2005/06	-1.66762	-0.05231	0.087233202
2006/07	-1.32	0.023051	-0.03042732
2007/08	6.594615	0.043448	0.286522833

2008/09	-1.98667	0.019381	-0.03850365
		Total	0.3557

We Have,

$COV(R_A, R_B) = \frac{\Sigma (R_A - \bar{R}_A)(R_B - \bar{R}_B)}{n}$ = 0.3557/5 = 0.0711

$WA = \frac{\sigma_B^2 - COV(R_A, R_B)}{\sigma_A^2 + \sigma_B^2 - 2cov(R_A, R_B)}$

$WA = \frac{(0.114)^2 - COV(0.0711)}{(3.3)^2 + (0.114)^2 - 2(0.0711)}$ = -0.058/10.76 = -0.0055

WB = 1+0.0055 = 1.0055

Portfolio Return & Standard Deviation of PICNL & EICNL

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

=1.62* -0.0055+(-0.04)*.1.0055

= -0.04913

$\sigma_P = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2W_A W_B COV(R_A, R_B)}$

$\sigma_P = \sqrt{(-0.0055)^2 (3.3)^2 + (1.055)^2 (0.114)^2 + 2(-0.0055)*(1.0055)(0.0711)}$

= 0.6799

Annex-25

Calculation of Covariance between Everest Insurance & Nepal Insurance & their weight portfolio, Risk & Return

F/Y	**$(R_A-\bar{R}_A)$**	**$(R_B-\bar{R}_B)$**	**$(R_A-\bar{R}_A)(R_B-\bar{R}_B)$**
2003/04			0
2004/05	-0.03143	-0.09499	0.002985536
2005/06	-0.05231	0.189516	-0.00991358
2006/07	0.023051	-0.12018	-0.00277027
2007/08	0.043448	-0.02127	-0.00092414
2008/09	0.019381	0.046911	0.000909182
		Total	-0.0097

We Have,

$$COV(R_A, R_B) = \frac{\Sigma (R_A-\bar{R}_A)(R_B-\bar{R}_B)}{n} = -0.0097/5 = -0.00194$$

$$WA = \frac{\sigma_B^2 - COV(R_A, R_B)}{\sigma_A^2+\sigma_B^2 - 2cov(R_A, R_B)}$$

$$WA = \frac{(0.1113)^2 - COV(-0.00194)}{(0.114)^2+(0.1113)^2 - 2(-0.00194)} = 0.01433/0.02927 = 0.49$$

WB = 1-0.49 = 0.51

<u>Portfolio Return & Standard Deviation of EICL & NICL</u>

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

=-0.04* 0.49+(0.0016)*0.51 = -1.87

$\sigma_P = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2W_A W_B COV(R_A,R_B)}$

$$\sigma_P = \sqrt{(0.49)^2\,(0.114)^2 + (0.51)^2\,(0.1113)^2 + 2(0.49)*(0.51)\,(-0.00194)}$$

$$= \quad 0.0732$$

Annex- 26

Correlation between the Insurance Companies

We have,

$$\therefore PAB = \frac{COV(RA,RB)}{\sigma A \sigma B}$$

Where,

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

COV (R_A, R_B) = Covariance between Stock A and Stock B

σ_A = Standard deviation of Stock A

σ_A = Standard deviation of Stock B

Between Himalayan Insurance and United Insurance

$$\therefore PAB = \frac{COV(RA,RB)}{\sigma A \sigma B}$$

$$= \frac{-0.012}{0.2490 * 0.29}$$

= -0.17

Between Himalayan Insurance and Premier Insurance

$$\therefore PAB = \frac{COV(RA,RB)}{\sigma A \sigma B}$$

$$= \frac{-0.023}{0.2490 * 0.2261}$$

= -0.41

Between United Insurance and Premier Insurance

$$\therefore PAB = \frac{COV(RA,RB)}{\sigma A \sigma B}$$

$$= \frac{0.007}{0.29*0.2261}$$

$$= \quad 0.10$$

Between Himalayan Insurance and Nepal Insurance

$$\therefore PAB = \frac{COV(RA,RB)}{\sigma A \sigma B}$$

$$= \frac{-0.023}{0.27*0.1113}$$

$$= \quad -0.75$$

Between Himalayan Insurance and Everest Insurance

$$\therefore PAB = \frac{COV(RA,RB)}{\sigma A \sigma B}$$

$$= \frac{0.0034}{0.27*0.114}$$

$$= \quad 0.1146$$

Between United Insurance and Everest Insurance

$$\therefore PAB = \frac{COV(RA,RB)}{\sigma A \sigma B}$$

$$= \frac{0.005}{0.29*0.114}$$

$$= \quad 0.15$$

Between United Insurance and Nepal Insurance

$$\therefore PAB = \frac{COV(RA,RB)}{\sigma A \sigma B}$$

$$= \frac{-0.011}{0.29*0.113}$$

$$= \quad -0.34$$

Between Premier Insurance and Nepal Insurance

$$\therefore PAB = \frac{COV(RA,RB)}{\sigma A \sigma B}$$

$$= \frac{-0.048}{3.3*0.1113}$$

$$= \quad -0.13$$

Between Premier Insurance and Everest Insurance

$$\therefore PAB = \frac{COV(RA,RB)}{\sigma A \sigma B}$$

$$= \frac{0.0711}{3.3*0.114}$$

$$= \quad 0.189$$

Between Everest Insurance and Nepal Insurance

$$\therefore PAB = \frac{COV(RA,RB)}{\sigma A \sigma B}$$

$$= \frac{-0.00194}{0.1113*0.114}$$

$$= \quad -0.15$$

Insurance Compamies in Nepal

- Nepal life Insurance Company Ltd
- Life Insurance corporation (Nepal)Ltd
- Alliance Insurance Company Ltd
- National life and general Insurance Co. Ltd
- Premier Insurance co. Nepal
- United Insurance Co. (Nepal)
- Sagarmatha Insurance Company Ltd.
- Nepal Insurance co. Ltd
- Himalayan general Insurance co. Ltd
- Rastriya Bema sasthan
- Neco Insurance co. Ltd
- Prudential Insurance co. Ltd
- NB Insurance Company Ltd
- Everest Insurance co. ltd

- National Insurance Co. Ltd
- National Development and Service group (P) Ltd
- Shikhar Insurance
- American life Insurance co.
- The oriental Insurance Co. Ltd
- Nepal insurance corporation ltd
- Prime life Insurance
- Asian Life Insurance