# RISK & RETURN ANALYSIS OF LISTED INSURANCE COMPANIES IN NEPAL

**A THESIS**

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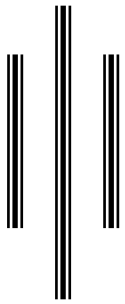

**Submitted to:**
**Office of the Dean**
**Faculty of Management**
**Tribhuvan University**

**In partial fulfillment of the requirements for the Degree of Master of Business Studies (MBS)**

**Birgunj, Parsa**
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# RECOMMENDATION

This is to certify that the thesis

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Entitled:

**"RISK & RETURN ANALYSIS OF LISTED 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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# VIVA – VOCE SHEET

We have conducted the viva – voce examination of the thesis

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and found the thesis to be original work of the student written in accordance with the prescribed format. We recommend the thesis to be accepted as partial fulfillment of the requirement for Master degree of Business Studies (MBS).

## Viva – Voce Committee

Chairperson, Research Committee: .....

Member (Thesis Supervisor): .....

Member (External Expert): .....

**Date:-**

# DECLARATION

I hereby declare that this thesis entitled "**RISK & RETURN ANALYSIS OF LISTED INSURANCE COMPANIES IN NEPAL**" submitted to Research Department of Thakur Ram Multiple Campus, Faculty of Management, Tribhuvan University, is my original work as partial fulfillment of the requirements of the degree of Master in Business Studies (MBS) and is prepared under the supervision of Mr. Rajeshwar Pd. Acharya Thakur Ram Multiple Campus, Birgunj.

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# ACKNOWLEDGEMENTS

This research study "**RISK & RETURN ANALYSIS OF LISTED INSURANCE COMPANIES IN NEPAL**" which is a partial fulfillment for the degree of Master of Business Studies (MBS) under the course designed by the Faculty of Management, Tribhuvan University, is based on the prescribed research format involving the use of qualitative and quantitative model to explain the relationship between risk and return of insurance companies operating in Nepal. I am hopeful that this study will be of some help to other researchers, students and those who are interested in the area of this study.

This study has been completed with the help of various people. I am fortunate to acknowledge my respected supervisor ***Mr. Rajeshwar Pd. Acharya*** of Thaku Ram Multiple Campus, T. U., whose guidance, encouragement and spending time with me was of immense help.

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Samridh Shrestha

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## ABBREVIATIONS

| | |
|---|---|
| A.D. | Anno Domini |
| B.S. | Bikram Sambat |
| CAPM | Capital Assets Pricing Model |
| CORR | Correlation |
| COV | Covariance |
| CV | Co-efficient of Variation |
| d. f. | Degree of Freedom |
| DPS | Dividend per Share |
| EIC | Everest Insurance Company |
| EPS | Earning per Share |
| ERR | Expected Rate of Return |
| FY | Financial Year |
| HGIC | Himalayan General Insurance Company |
| MBS | Master of Business Studies |
| MPS | Market Price of Stock |
| NEPSE | Nepal Stock Exchange |
| NGB | Nepal Grindlays Bank |
| NLGIC | National Life and General Insurance Company |
| PIC | Premier Insurance Company |
| RRR | Required Rate of Return |
| SBI | Nepal SBI Bank Limited |
| SD | Standard Deviation |
| SEBO | Securities Board of Nepal |
| TRMC | Thakur Ram Multiple Campus |
| T. U. | Tribhuvan University |
| UIC | United Insurance Company |

# CHAPTER - I
# INTRODUCTION

## 1.1 Background of the Study

Development of any country is directly related with its economic development. The economic development of the country in turn depends upon the capital formation and industrialization; Industrialization can be achieved through proper use of the funds and their investment in the productive sector. Scattered funds around the country can be collected through the financial institutions. Investment can be made through the stock market or capital market. Stock market is such financial market, which facilities the buying and selling of the stock conveniently to all those who are interested in carrying out the transaction. It is assumed that development of stock market marks the development of country's financial sector and it finally helps in the growth of the nation. Hence it is very essential to have very sound and active stock market also helps to regulate various sector as well as it helps general public by providing the necessary information and services under one roof thus making it easy for them. Securities markets exist in order to bring together buyer and seller of securities meaning they are mechanism create to facilitate the exchange of financial assets.

Stock market is the financial market, which probably has the greatest glamour and is perhaps the least understood. Some observer considers it as legalized heaven for gambling and many investors consider stock market investing as a game in which sole purpose is picking winners.

The history of capital market in Nepal dates back to the era of Rana Prime Minister Juddha Samsher. Though the history of capital market dates that back, it is not developed properly. The industrial revolution took place in Nepal after the establishment of Biratnagar Jute Mill in 1936 and one year later Nepal Bank Limited was established for

promoting banking and industrial sector. Only few companies has issued its hare to the public before operation of company act. Government was the sole issuing authority when there was absence of developed security market. Institutional development of security market in Nepal started from the year 1976 when security exchange center was established under company act as a joint venture of Nepal Rastra Bank and Nepal Industrial Development Corporation. The main objective behind the establishment of this center was to mobilize public saving and to encourage people to participate in business activities. Further to regulate the securities market end to protect and promote the interest of investor Securities Board of Nepal (SEBO) was established on 26 May 1993. His Majesty's Government converted securities exchange center to Nepal Stock Exchange (NEPSE) and it started its trading operation from January 1994.

The Nepalese securities market growing at a slow rate, as it has to overcome various obstacles that it has to face due to lack of proper development of the market. For the proper development of the capital market is more investment is needed. Capital market can be divided into primary market and secondary market. Securities in the capital market are much more diverse than securities in the primary market.

NEPSE is the single organized exchanges of Nepal, which helps in systematic trading of securities. All the companies must be listed in NEPSE for the trading of their securities in secondary market. The basic objective of NEPSE is to impart free marketability and liquidity to the government and corporate securities by facilitating transaction in its trading floor through market intermediaries such as broker, market makers etc.

## Investment

Investment means to invest in anything with an aim to earn certain profit. In other works satisfactory current earning for future earning is

investment. Risk and time is always associated with an investment. Investment helps to increase the national output also. An investment is the current commitment of money or other resources in the hope of reaping future benefits.

According to J. Jordan and Donald E. Fisher, "An investment is the commitment of funds made in the expectation of some positive rate of return. If the investment is properly under taken, the return will be commensurate with the risk the investor assumes."

Our study is mainly concerned with the investment in the security market. Investment in stock market can only be fruitful if decided after analyzing all merits and demerits of the security to be invested in. Investment also involved emotional the investor's objective and the amount to his or her fund to be invested.

**Investment Alternatives**

Wide ranges of investment alternatives are available in the stock market. The alternative thus available differs according to their nature. The interested investors can choose from wide range of alternatives, one that suits them the best. He/she should undertake investment alternative only after making detail enquiries about them. Broadly investment can be distinguished as:

a. Real investment i.e. investment on tangible assets such as land buildings.
b. Equity: Common stock and preferred stock.
c. Short-term debt.
d. Intermediate and long term debt.
e. Hybrid Security.
f. Warrants, convertibles and options.
g. Derivatives securities.
h. International securities.
i. Other investment alternatives.

## Common Stock

Out of the various types of the securities presents, this study deals with common stock investment. Common stockholder of a corporation are its residual owners, their claim to income and assets comes after creditors and preferred stock holders have been paid full. As a result, stockholders return on investment is less certain than the return to leader or to preferred stockholders. On the other hand, the share of a common stock can be authorized either with or without par value. The par value of stock is merely a state figure in the corporate charter and is of little economic significance. Confirm our observation from the fact the every year more and more insurance companies are being listed with NEPSE.

## Risk

Risk is typically defined as uncertainly. It arise from imperfect knowledge or firm incomplete data. Risk plays a central role in the analysis of investment. Investor often asks about the total risk they will be assuming in an investment and like to know if the risk premium provided is enough. But they are also concerned about many other issues. First of all it is necessary to see if the total risk associated with a single assets is relevant to them. Second they need to know actual contribution of an asset risk to assets portfolio.

Risk is always associated with an investment, what degree of risk one prefers depends entirely on his other perception. Any rational risk adverse investors would want to maximize his return at minimum risk. Investment simply means to sacrifice current fund for further cash flow. The investment process describe how an investor should go about making decision with regard to what marketable securities to invest in, how much should be invested and when to invest. First the inventor should set in the investment objective in regard of risk and return and them he must carry out both technical and fundamental analysis.

## Return

Return means any addition to the initial amount. The return on an investment is usually dividend plus any charge in the market price of share and it is usually expressed in percentage. Since both dividend and change in market price of share is uncertain hence actual return of investment may differ from expected return. This variability of return between expected and real is defined as risk.

The return is total gain of loss experienced on an investment over a given period of time. It is commonly measured as a change in the value plus any cash contribution during the period expressed as a percentage of the beginning of the period investment value.

## Portfolio

Portfolio is simply combination of two or more securities. Portfolio analysis considers the determination of future risk and return in holding various blends of individual securities. To minimize the risk and to increase the return a portfolio can be constructed investment in two or more than two securities is called portfolio formation or diversification of fund. Diversification involves constructing investor's portfolio in such manner that risk is minimized a little. The objectives of portfolio analysis are to develop a portfolio that has a maximum return at the level of risk investor find appropriate.

Portfolio analysis considers the determination of future risk and return in holding various blends of individual's securities. Portfolio expected return is the weighted average of the expected return of the individual securities but portfolio variance can be something less than a weighted average security variance. As a result an investor can some time reduce portfolio risk adding another security with greater individual risk than any other security in portfolio.

## Insurance Companies

Institutional investors such as insurance companies are inventory in securities and spreading the risk. There are various institutions in Nepal, which help to called the unused fund from the general public and mobilize it in productive sector. Insurance companies also fall under such category. Insurance means a contract where one party in consideration of money payment called premium undertakes to protect other party against any loss or pay to that party the agreed sum of money on the happening in certain event. In business as well as private life there is danger of every kind. The aim of the insurance companies is to make provision against such danger. Insurance companies are there to compensate for the possible loss. An insurance company does not prevent risk of loss but it compensates the loss by spreading out the risk on shoulders of the community. In reality insurance is a social security. It helps to protect certain level of income of people. In today's uncertain environment it has gained immense popularity.

In Nepal insurance companies were properly developed after 2025 B.S. Insurance companies are registered under insurance company Act 2025 B.S. Since then number of insurance companies providing services to general public is increasing rapidly and this reveals that the insurance companies are important and useful in the every day life of the people we can see that this fact has been stated to be acknowledged by the general public. They have started taking it very seriously. Long-term investment is available in life insurance whereas non-life is usually of 1 year and below. The focus of this study will be those insurance companies that are listed in NEPSE. But we have not included all the insurance companies listed in NEPSE due to certain constraints like time and availability of adequate data, we hope the selected insurance companies of this study will represents all other insurance companies listed NEPSE.

## 1.2 Statement of the Problem

In this study we are trying to analyze the problem faced by individual investor due to lack of knowledge and information and at the same time we are trying to discuss the weakness of concerned people is not being able to develop the stock market properly. Numbers of the public limited companies are increasing rapidly but the investment opportunities have not increased in that ratio. The rapid expansion in the amount of fund raised, number of investor in the primary market and increasing number of listed securities has speedily raised the market capitalization, which is the indication of bright future of capital market in Nepal.

The investment practice of the investors has remained the same. They still believe in the mouth publicity and friend's opinion while making an investment. They do not try to seek information about the organization on whose stock they are going to make investment. Previous research shows that most of the Nepalese investors are investing their fund in single security rather than investing in portfolio of securities to maximize return at minimum level risk.

As investors are the main sources of fund for the business entities, however, in our context, investors have been receiving less concern from the firms and even neglected. Common stock is regarded as risky security for the investment purpose, however by using the financial tools and technique; we can reduce the associated risk. The availability for the information may develop the confidence on investors and stock could be attractive way to invest. On the other hand, the concept of portfolio helps to reduce the risk. But the question arises whether there is sufficient information available to the investors or not; and whether investor can assess the risk and return associated with particular stock or not.

At the same time there are no any separate institutions, which provide information required to rational decision that can accelerate the stock investment and market efficiency. Government policy is less encouraging in promoting common stock investment. Government policies are also unable to create favorable and proper investment environment to encourage investors to invest in this field. Government has not taken any serious steps to regulate one and only stock market of the country. Government policies also seem to favor the companies and not the individual investors.

There is lack of investment opportunity to the individual investors hence all the responsible sector has to contribute to increase the alternative of investment and to provide the information about the market.

The study focuses on following major issues:

i. How to measure the risk and return associated with investment in the stock? How much returns the common stocks of insurance companies provide to their investors in respect to the risk the investors need to bear?
ii. What are the risk structures (components of total risk) of common stock of insurance companies?
iii. Is the risk and return patterns of stock of sample firms are consistent with financial theories?
iv. How can the investors can reduce the risk and optimize the return? And what is the optimal portfolio to minimize the risk and maximize the return?

## 1.3 Objective of the Study

The major objective is to examine the risk and return of common stock investment of insurance companies. The specific objectives are as follows:

i. To measure the risk and return associated with the stocks of listed insurance companies.
ii. To segregate the total risk of individual stock into systematic and unsystematic risk and scrutinize its relation with return on stock and to find their consistencies.
iii. To make suggestion to investors to create optimal portfolio of stocks of insurance companies.
iv. To suggest some practical ideas and provide recommendation based on data analysis.

## 1.4 Significance of the Study

**Today each and every decision-making is based on financial, as it is an important branch of economy. As we have discussed above major target of the study is the potential investor who wants to invest in the securities market but repel due to imagination of unreal risk. So the study will be more significant for exploring and increasing of stock investment. It will also provide little contribution in the stock market development.**

After the restoration of democracy in 2046 B.S. people's participation in security investment and stock trading increased unexpectedly but it could not attract people as expected because there was lack of proper information. Nepalese stock market has great potentialities, which can be utilized by increasing transparency, flow of information and developing analytical power of public stock investors.

This study will be beneficial to the potential investors who want to invest in security by providing them with the needed information and it will prove equally beneficial to the present investors to analyze and revise their action. This study will create awareness about utilization of investor's scarce resources and help to identify risk and return trade off their investment.

It will provide basic concept and situation of risk and return of Nepalese investment. With the help of various analytical tools risk & return associated with common stock to the sampled companies are evaluated. This study will be helpful in taking the right decision.

This study will not only help the investors but it will also be beneficial to the many other researchers in the area of investment and assets management and it might prove beneficial to the concerned companies.

## 1.5 Research Design

Research design is necessary to fulfill the objectives of well-set research. It is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. A research can design in many different ways. It serves as a framework for the study, guiding the collection and analysis of data. Researcher design is the plan and structure and strategy of the investigation.

This study based on data extracted from annual reports of sample insurance companies for 6 consecutive years starting from 2059 to 2065. This study is quantitative and also analytical and descriptive research design has been used. It covers quantitative method in a greater extent and analyze risk and return of five insurance companies in Nepal. This study also tries to analyze portfolio construction separate systematic and unsystematic risk, to find out proportion of diversified and undiversified risk.

## 1.6 Limitation of the Study

The study is carried out to fulfill the partial requirement of MBS degree of T.U. though full effort was put into present it in the form as

required it is no without shortcomings. Like every other research it also has its limitations. Some of the limitations, which were faced during the writing of this thesis, are as follow:

a. This study is done under the core requirement of MBS degree; time and resources stands as constraints.
b. This study mainly relies on the secondary data which are collected from annual financial statements. Hence the study suffers from all those limitations that are associated with annual financial statements.
c. This study includes only 5 sample firms (insurance companies) for the period of 6 years from 2059 to 2065 and accounting year 2058/59 has been read as 2065 B.S.
d. This study only focuses on the analysis of risk and return of common stock of investment of selected insurance companies.

## 1.7 Population and Sample

This study is based on the insurance companies listed in the NEPSE index. Currently there are 171 companies listed in the NEPSE. Among them 17 are insurance companies. For this study, 5 sample insurance companies are selected randomly from those which are in operation from 2057. The sample covers more than 30 percent of population.

The name list of the sample selected for the research is as follows:

| Category | Population Size | Sample Size | Name of the Sample Companies |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Insurance Companies | 17 | 5 | i. Premier Insurance Company (PIC).<br>ii. Everest Insurance Company (EIC).<br>iii. Himalayan General Insurance Company (HGIC).<br>iv. National Life and General Insurance Company (NLGIC)<br>v. United Insurance Company (UIC) |

**This study mainly based on secondary data collected from Nepal Stock Exchange, Financial Statistics, Annual Report, and Trading Report. Other data provide by Security Board of Nepal and related companies data are taken from the companies as well as their web sites, other related books and booklets.**

## 1.8 Research Methodology

**Research methodology is the systematic way of solving research problem. It refers to the overall research process, which a researcher conducts during his/her study. In this chapter research design, population and sample, sources of data, data collection technique, data analysis tools are include. A research can be conducted on the basis of primary and secondary data. In this study all the data from secondary sources and the observed data is analyzed with using appropriate financial and statistical tools.**

**A. Financial tools:**

- **a. Percentage Change**
- **b. Ratio Analysis**
- **c. Growth Rate**
- **d. Portfolio Analysis**
- **e. Risk & Return Analysis**

**B. Statistical tools:**

- **a. Co-efficient of correlation analysis**
- **b. Mean**
- **c. Standard deviation & co-efficient of variation**

## 1.9 Organization of the Study

Chapter – I: Introduction

Chapter – II: Review of Literature

Chapter – III: Research Methodology

Chapter – IV: Data Presentation and Analysis
Chapter – V: Summary, Conclusion and Recommendations

Chapter One: The introduction chapter includes introduction, background of the study, statement of problem, objective of the study, significance of the study, of the study, limitation of the study, a profile of GC and design of the study.

**Chapter Two: It focuses on review of literature. It contains the conceptual framework and past research literature relevant to materials management and/or this study.**

Chapter Three: The third chapter deal with research methodology to be adopted for study consisting introduction, research design, population and sample, nature and sources of data, data collection procedures, research variables and tools and techniques employed.

Chapter Four: This chapter contains data presentation, analysis and interpretation by using financial and statistical tools and major findings of this study.

Chapter Five: It covers summary, conclusion and recommendation of this study.

# CHAPTER – II
# REVIEW OF LITERATURE

## 2.1 Introduction

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

Review of literature is a chapter where researchers review books, journal, magazines or any other type of studies, which are relevant to

his/her field of study. Review will help us to perform our study in right track through proper knowledge of the topic. Review of literature further help us to identify the problem, to avoid unintentional replication of previous studies and also helps us to interpret the significance of researchers results in process manner.

This chapter has three sections. Section I deals with conceptual framework whereas Section II deals with review of Journal Articles and finally Section III deals with review of early thesis in this subject matter.

## 2.2 Conceptual Review

In this section various books are reviewed which are related with topic, which may helpful to understand clearly about risk and return. The objective of this section is to know how various writers have defined and described risk and return. Their main focus is implication of risk and return in the investment of common stock.

### 2.2.1 Investment

Investment simply means sacrificing current earnings for further return or reward bearing certain risks. Investment can be made on real assets or finance assets. Investment on real assets is called real investment and on finance assets is called financial investment.

"Investment in the broadest sense means the sacrifice of current dollars for further dollars. Two different attributes are generally involved time and risk. The sacrifice takes place in the present and is certain. The rewards come later, if at all and the magnitude is generally uncertain." (Sharpe, 1995:1)

In primitive economics most investment was real variety, whereas in modern economy most investment is of financial variety.

"An investment is a commitment of money that is expected to generate additional money. Every investment entails some degree of risk: It rewards a present certain sacrifice for a future uncertain benefit." (Francis, 1992:1)

**Investing or speculating, in the stock market has all the characteristic of the game and the aim is to win. Investment decision involves emotional activities. Investors invest their fund on securities for the long run future returns. Investment involves making decisions whose outcome cannot be predicted and it is always associated with risk and returns a wide range of investment opportunity is available to investors. Investment can be made on common stock, preferred stock, bond, convertible, warrant, option etc. Among various alternatives the present study focuses on common stock investment only.**

### 2.2.2 Common Stock

Since the study is about the common stock of insurance companies, light must be thrown on into make it clearer. Whenever a company needs capital for expansion, for creation of new job, for product development etc, it sells of share of its stock to public. Common stock may be defined, as shares in the ownership of the firm Common stockholder are real owner of business firm. Common stocks are more risky than both bonds and preferred stocks but it has also benefit like voting right in participation in profit. And also common stock may be purchase and sold immediately.

"Common stock is a type of security which represents a commitment on the part of a corporation to pay periodically what ever its board of directors deems appropriate as a cash dividend. A firm may promise a right to share in its profit in return for an investor's fund. Nothing pledged, and no irrevocable promises, are made. The firm pays simply whatever its directors deem reasonable form time to time. However, to protect against serious malfeasance, the investor is given the right to

participate in the board of directors. The investor's property right is represented by a share of common stock, which could be sold some one else, who win then be able to exercise right the holder of common stock is said to be an owner of the corporation and can, in theory, exercise control over its operation through the board of directors." (Sharpe, 1995:3-7)

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

"Stock is the ownership interest of a corporation each share of stock is fraction of the right and privilege that belongs to the owners of a business. A stock certificate is evidence of that fractional ownership. It is tangible evidence. A certificate of title to part of the company." (Henderson, Garyl and Wert, 1984:2)

"Of all the forms of securities common stock appears to be the most romantic. Which fixed income investment revenue may be more important to the most of investors. Common stock seen to capture their interest the most. The potential reward and penalties associated with common stock make them an interesting even exciting

proposition, no wonder common stock investment is favorite topic for conversation in parties and get together." (Prasanna, 1995: 93)

"Common stock holders are the owner of the corporation. As owners, common stock holders have certain right; the most important are (i) the right to participate in profit distribution (ii) the right to vote etc. From the corporation viewpoint, common stock represents a fund raising device. From the investor's view point stock ownership gives the stockholders an opportunity to share in the profit when declared as dividend, an opportunities to make money an appreciation in the corporation." (Bradley, 1995:104)

So common stocks are more risky than both bond and preferred stock from the point of investment. Equity stock gives several rights to the stockholders. He/she has the right to vote, the right of dividend, right of being offered right shares, the right to bonus issue and certain tax benefit. Investment in common stock is highly liquid because common stock may be purchased and sold immediately. While the stockholders have the right of being the owner of the firm his liability is limited only to the extent of his investment. Due to high and more advantages common stock is most popular and attractive investment among investors.

### 2.2.3 Return

Return is reward received from investment for sacrifice of present certain amount of asset. It is commonly defined as reward for bearing risk. Return is the major factor behind any investment. It is the most important outcome of any investment. It measures the investor's rate of wealth accumulation i.e. increase or decrease in the wealth of the investor. Return is the total gain or loss expire need in an investment over a given period of time. It can also be defined as the after tax increase in the value of the investment.

**"Return is desired as the dividends yields plus the capital gain or loss. The relationship between different levels of return on their relative frequencies is called a probability distribution for the relative frequency of a firm's annual return by analyzing its historical returns over the previous year. But we know that history never repeats itself exactly. Hence after analyzing relative frequencies of historical return for the individual company. We can form a probability distribution based on a historical data plus the analysis for the outlook for the economy, for the industry and outlook for the firm in its industry and other factor" (Weston & Brigham 1990: 94)**

**The return can be defined as" The total gain or loss experienced on behalf of the owner over a given period of time, and calculated by dividing the assets change in value plus any cash distribution during the period by its beginning of period investment value" (Gitman, 6th Edition:59)**

**Return can be of different types like holding period return, return from speculation or return from short sell, capitalization etc. Holding period rate of return is useful with the investment horizon of one year or less whereas for longer periods, it is better to use rate of return as an investment yield. Return comes from two sources income and price appreciation. Investment decisions based on expectation about the future. "The return from holding an investment over some period- say- a year is simply cash payments received due to ownership plus the change in market price divided by the beginning price. Thus, income return comes from two sources: income plus any price appreciation (or loss in price) for common stock defines one period return as:**

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

**Where R is the actual (Expected) return when t refers to a particular time period in the past (future); $D_t$ is the cash dividend at the end of time period t; $P_t$ is the stock's price at time period t and $P_{t-1}$ is the stocks price at time period t-1. Notice that this formula can be used to determine both actual one-period returns (when based on historical figure) as well as expected one period returns when based on future expected dividends and prices. Also note that the term is parenthesis in the number of the above equation represents the capital gain or loss during the period" (Van Horne and Wachowicz, 2001:94)**

**Return is the key variable in the investment decisions because this measure allows us to compare the amount of actual or expected gain provided by various investments.**

Expected Return: **It also can be used in investment decision process rather than historical behaviors. It is what you think the stock bonds will earn in the future (in terms of dividend/ interest plus capital gain) that determines what an investor should be willing to pay for a security.**

**"Of all the forms of securities common stock appears to the most romantic while fixed income investment avenue expected return."(Sharp, Gordon and Bailey, 5th Edition: 177)**

**"Return on typical investment consists of two components. The basic component is the periodic cash receipt (or income) on the investment, either in the form of interest or dividends. The second component is the change in price of the assets commonly called the capital gain or loss. Thus element of return is the difference between the purchase price and the price at which the asset can be sold; there fore, it can be a gain or loss.**

**The income form an investment consists of one or more cash payment paid at specific intervals of time. Interest payments on most bonds are paid semiannually, whereas dividends on common stock are usually paid quarterly. The distinguishing feature of these payments is that they are paid in cash by the issuer to the holder of assets.**

**The term yield is often used in connection component in the relation to some price for a security. For our purpose, the price that is relevant is the purchase price of the security. The yield on a $ 1000 par value, 6 percent coupon bond purchase for $ 950 is 6.31 percent ($601, $ 950). The yield on a common stock paying $2 in dividends per year and purchased for $50 per share is 4 percent. One must remember that yield is not, for most purposes, the proper measure of return from a security. The capital gain or loss must also be considered" (Fisher & Jordon, 2000:66)**

### 2.2.4 Risk

**Risk is the uncertainty associated with the end of period value of an investment. Risk and return are the determinants for the valuation of the securities. How ever, risk means that we do not know what is going to happen even though we occasionally have a good idea of the range of possibilities. Risk is a hazard, a peril and exposure to loss or injury. Thus most risk refers to the chance that some unfavorable event may occur, while other view it as a chance of loss but in reality particular activity or event.**

**Risk is the product of all potential outcomes expressed with probability associated with each other and it distribution of such outcomes.**

**"Risk exists because of the inability of the decision maker to make perfect forecasts. Forecasts can be made with perfection or certainty since the future events on which they depend are uncertain. An investment is not risky, if we can specify a unique sequence of cash flow for it. But risk arises in investment because we cannot anticipate the occurrence of the possible future events with certainty. Risk associated with an investment may be defined as the variability that is likely to occur in the future returns from the investment. If the investor invests in share of company than it is not possible to estimate future returns accurately. The return could be negative, zero or some extremely large figure". (Pandey, 1999:574-575)**

**Risk play central role in the analysis of investment. There are various types of risk, which an investor might have face like interest rate risk, financial risk, business risk, management risk, market risk, currency risk, assets class risk etc. Risk is very much likely to occur in any type of investment but proper analysis will be able to help us to minimize the risk up to some extent. "Risk defined most generally is the probability of the occurrence of unfavorable outcomes. But risk has different meaning on different context. In our context two major developments from the probability distribution has been used as initial measure of return and risk." (Weston & Brigham, 1990:93)**

**"In the most basic sense risk is the chance of financial loss. Assets having greater of chance of loss are viewed as more risky than those with lesser chance of loss more firmly, the term risk is used inter changeably with uncertainty to refer to the variability of return associated with a given assets. The more certain the return from an assets the less variability and therefore the less risk." (Prashan, 2000:303-313)**

**Risk is the chance that the actual return from investment may differ from what is expected. Risk plays vital role in the analysis of investment. Investors often ask about the total risk they will be assuming in an investment and wants to know if the risk premium provided is enough.**

**Every investment involves uncertainties that make returns on investment risky. Actually risk in a simple language is an uncertainty. Risk is the typically defines as uncertainty. It arises from imperfect knowledge or from incomplete data.**

**The variability of the return may be defined as the extent of deviation of individual rate of return from the average rate of return. There are measures of dispersion, Variance and standard deviation. The following steps are involved in calculating variance or Standard Deviation of rates of return of assets or securities using historical returns.**

**Average rate of return** $\bar{R} = \frac{1}{n}\sum_{t-1}^{n} Rt$

**Calculation of sum of individual rate of return from average rate of return and square. (** $R-\bar{R}$ **)²**

**Calculation of sum of the squares of the deviation as determined in 2nd step and divides it by the no. of periods or observation to obtain variance.**

$$\text{Var}(\sigma)^2 = \frac{1}{n}\sum_{t-1}^{n}(R-\bar{R})^2$$

**Calculation of standard deviation**

$$\sigma = \sqrt{\sigma^2} \quad \text{or,} \quad \sigma = \sqrt{\frac{1}{n}\sum_{t-1}^{n}(R-\bar{R})^2}$$

**Where, $\sigma$ = Standard Deviation**
**R = Holding Period Rate of Return**
**$\bar{R}$ = Expected or Average Return**

**Standard deviation is not a complete measure of risk. Another useful measure of risk is the coefficient of variation which is standard deviation divided by expected return.**

**The coefficient of variation shows the risk per unit of return, and it provides a more meaningful basis for comparison when the expected returns on two alternatives are not same.**

**The coefficient of variation can be measured with the following equation:**

$$\mathbf{Cov_j} = \frac{\sigma_j}{R_j}$$

**Where, $CV_j$ = Coefficient of Variation on Stock j.**
**$\sigma_j$ = Standard Deviation on Stock j.**
**$\bar{R}j$ = Expected Rate of Return on Stock j.**

## 2.2.5 Portfolio Analysis

**Portfolio is simply a combination of two or more securities. Combination of investment in more than one asset is termed as portfolio. "The objective of portfolio is to analyze different individual assets and delineate efficient portfolios. The group of efficient portfolios will be called the efficient set of portfolios, the efficient set of portfolios comprises the efficient frontier" The efficient frontier is the locus of points in risk-return space having maximum return at each risk class. The efficient frontier dominates all other investment. (Francis, 1991:236)**

**Portfolio is combination of assets and collection of securities. In portfolio standard deviation, correlation between security return plays a vital role in the risk reduction. Portfolio theory gives the concept of investment in a very good way that "never keeps all your eggs in a single basket" i.e. never invest your entire amount in a single asset. Investment on more than one security means diversification or minimization of risk. Portfolio shows how an investor can reach his optimal portfolio position. The portfolio theory provides a normative approach to the investor's decision to invest in assets or securities under risk. It is based on assumption that the investors are risk averse.**

**"A portfolio is collection of investment securities. Portfolio theory deals with the selection of optimal portfolios that is portfolio that provides the highest possible return for any specified degree of risk or the possible risk for any specified rate of return". (Weston and Copland 1992:302)**

**"The term of portfolio simply means collection of investment. For an investor through the stock exchange the portfolio will be a collection of share holding in different companies for a property investor has portfolio will be a collection of buildings. To a**

**financial manager with in an industrial company has portfolio will be apparent that the actual nature of the components of portfolio depends on the population of opportunities from which the selection has been made" (Raymond, 1990:148)**

**Portfolio theory developed by Markowitz is based on the following assumption:**

- **The expected return from an asset is the mean value of a probability distribution of future return over some holding period.**
- **The risk on the individual assets or portfolio is based on the variability of return.**
- **Investors depend solely on their estimates of return and risk in making their investment decision.**
- **Investors adhere to dominance principal i.e. for any given level of risk investors prefer asset with higher expected return to assets with the lower expected return.**

**The expected return of portfolio is simply a weighted average of the expected return of the securities containing in that portfolio but portfolio risk depends not only on the risk of the securities consisting the portfolio but also on the relationship among those securities. "The expected return on portfolio is the sum of the return on individual securities multiplied by the respective weight (proportionate investment). It is weighted average rate of return. But portfolio risk is the risk of individual securities plus covariance between securities. The portfolio risk will equal to the weighted risk of individual securities if the correlation of coefficient is +1. If the correlation of coefficient is less than +1, the portfolio risk will be less than the weighted average risk. If correlation coefficient is –1 or perfectly negative portfolio risk becomes zero." (Pandey, 1995:347-348)**

**In the above definition of portfolio we conclude that it help to analyze the risk and return data describing each investment candidate and determine which assets to buy, what not to buy and what to sell short.**

**"Standard deviation of portfolio is not a simple weighted average. In portfolio standard deviation correlation between security returns plays a vital role in risk reduction. Correlation between security returns complicates our calculation of portfolio standard deviation by forcing us to calculate the covariance between returns for every possible pair wise combination of securities in the portfolio. There are three influences reduce portfolio risk in**

**relation to the standard deviation of individual securities in isolation.**

a. **The extent to which the correlation between the returns from the individual securities is less than.**
b. **The number of securities in the portfolio**
c. **The proportion or weight of the individual securities in the portfolio in relation to their correlation among one other. The effect of three influence combined can be determined by relating individual securities to all securities the market portfolio. (Weston & Brigham, 1981:99-103)**

**Correlation is the statistical tools to measure the relationship between more assets. If the relationship is direct they are called positively correlated and if relationship is inverse they are called negatively correlated. If changes in one asset doesn't affect the other variable are called uncorrelated.**

**Symbolically,**

$$\text{Correlation (p)} = \frac{Cov_{im}}{\sigma_i \sigma_m}$$

**Where,**

**$Cov_{im}$ = Covariance between security and market.**

$\sigma_i$ **= Standard deviation of security.**

$\sigma_m$ **= Standard deviation of market return.**

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

**Symbolically,**

$$E(rp) = X_i \times E(r_i) + X_j \times E(R_j)$$

**Where, E(rp) = Portfolio return.**

**$X_i$ = Proportion of wealth invested in $i^{th}$ assts.**

**$X_j$ = Proportion of wealth invested in $j^{th}$ assts.**

**$E(r_i)$ = Expected return on $i^{th}$ assets.**

**$E(R_j)$ = Expected return on $j^{th}$ assets.**

**Portfolio risk can be measured by using following equation:**

$$\sigma p = \sqrt{x_i^2 \sigma_i^2 + x_j^2 \sigma_j^2 + x_i x_j p_{ij} \sigma_i \sigma_j}$$

**Where,**

$\sigma p$ **= Portfolio Standard Deviation.**

**$X_i$ = The Proportion of Portfolio Devoted by Security i.**

**$\sigma_i$ = The Standard Deviation of Security i.**

**$X_j$ = The proportion of portfolio devoted by Security j.**

**$\sigma_j$ = The Standard Deviation of Security j.**

**$P_{ij}$ = Correlation between the Security the Security i and j.**

**The risk is the total risk that arises in the business. Any type of business, whether that may be of large or small scale suffers risk. Because investment is a part of economics and the economical cycle changes frequently, when the market bullish there is low risk and when it starts declining i.e. bearish there may be high risk. The risk, which we talk, may be systematic risk and unsystematic risk associated with investment. Hence, the risk can be classified as diversifiable risk, also known as unsystematic risk and un-diversifiable risk is the systematic risk, which is neither avoidable nor can be quit. The combination of these two risks is the total risk. Total risk systematic risk + unsystematic risk.**

**Systematic risk is also known as non-diversifiable risk. This risk arises due to the change in the economic state or due to change made by government in fiscal or monetary policies. Some examples of systematic risk are change in interest rate policy by government, increase in corporate tax rate, increase in inflation rate etc.**

**Unsystematic risk arises due to the many more reasons, like labor strike entry of formidable competitor in the market loss on a big contract bid, company not being able to manage or obtain adequate raw materials on time etc. These type of risks normally minor one and can be handled by the management. That's why this type of risk is called diversifiable risk.**

**Characteristic line is used to measure both systematic risk and unsystematic risk. The equation for the characteristic line is:**

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

**Where,**

**$a_i$ = The intercept for the its assets (alpha)-**

**$b_i$ = The slope for the $i^{th}$ asset.**

**$e_{it}$ = The regression model's unexplained residual return that occurs in period t.**

**Beta is a measure of non diversifiable risk or market risk that is it shows now the price of a security responds to market forces. It is found by relating the historical returns on a security with the historical return for the market. Market return is typically measures by average return of all (or a large sample of) stock. The beta for overall market is equal to 1 all other betas are viewed in relation to this value. The ready availability of security betas has enhanced their use in assessing investment risk, in general the higher the beta, the riskier the security. For stock having**

**positive betas, increase in the market return result an increase in return.**

**The different values of beta are defined as follows:**

Beta Equal to 1 (β=1)

**It signifies the average level of systematic risk in the market and implies that changes in stock's respond to changes in market for example 1% change in market return will causes exactly 1% change in stock return and it commands the average market risk premium.**

Beta Less than 1 (β<1)

**It indicates that stock returns are less volatile than the market return. For example 1% change (increase or decrees) in market return will cause less than 1% increase or decrease in stock's return. β<1 implies that stock return is less sensitive to market fluctuation and the stock is called defensive type.**

Beta More than 1 (β>1)

**It indicates that stock returns are more volatile than the market return. For example: 1% change in market return will cause more than 1% change in stock's return. β>1 implies that stock return is more sensitive to market fluctuation and the stock is called aggressive type.**

**Mathematically Define as:**

**Beta (bi) = Cov(i,m)/Var ($r_m$) = Slope of regression line**

**Where,**

**Cov(i,m) = Covariance of return of the $i^{th}$ asset with the market.**

**Var ($r_m$) = Variance of the return of the market index.**

## 2.2.6 Capital Assets Pricing Model (CAPM)

**Capital asset pricing model almost always referred, as CAPM is a centerpiece of modern financial economics. Where portfolio theory deals with selection of optimal portfolio. Capital market theory deals with an equilibrium model of asset prices. Especially capital market theory postulates the ex-ante risk return relationship of individual asset as well as portfolio under equilibrium conditions. In general the CAPM indicates that assets required return should be related to the risk free rate of return plus a risk premium based on the beta of the assets.**

**CAPM is a model that describes the relationship between risk and required 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. The model is:**

$$\sum(R_j) = R_f + (R_m - R_f)\,\beta_j$$

**Where,**

$\sum(R_j)$ **= The required rate of return of asset j.**

**$R_f$ = The nominal risk free rate of return.**

**(The real risk free rate of return plus risk premium for inflation)**

**$\beta_j$ = Beta coefficient of stock j.**

**$R_m$ = The expected rate of return on the market portfolio.**

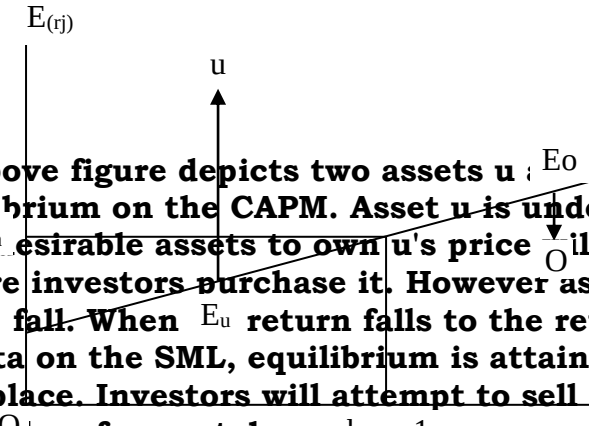
**"The CAPM is undoubtedly the most successful model to link the risk and expected return of capital assets. The relationship between expected return and unavoidable risk, and the valuation of securities that follows, is the essence of the capital asset pricing model" (Van Horne, 1997:62)**

Assumption of CAPM

- **The capital markets are efficient. The capital market efficiency implies that share price reflected all available information.**
- **All investors have the same expectations about the expected return and risk of securities.**
- **All investor's decisions are based on single time period.**
- **All investors can be land and borrow at risk free rate of interest.**

**"Based on the behavior of risk averse investors there is an implied equilibrium relationship between risk and expected return for each security. In market equilibrium a security is supposed to provide an expected return commensurate with its systematic risk of a security. Greater the systematic risk greater the return that investor will expect form the security. The relationship between expected return and systematic risk and the valuation of securities that follow, is the essence to Nobel Laureate William sharp's capital assets pricing model (CAPM). (Van Horne & Wachowitz, 1996:101)**

**"A graph of the CAPM is given below:**




**Above figure depicts two assets u and o, not in equilibrium on the CAPM. Asset u is undervalued and therefore very desirable assets to own u's price will rise in the market as more investors purchase it. However as u's price goes up its return fall. When return falls to the return to consistent with its beta on the SML, equilibrium is attained with o just opposite takes place. Investors will attempt to sell o since overvalued. And therefore put down 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." (Francis, 1986:267-269)**

**Hence CAPM helps us to decide whether to purchase or sell the stock of the particular company. We decide by comparing**

**required rate with the expected rate of return .The capital asset pricing model provides us a means by which to estimate the required rate of return on a security. And on the basis of price and dividend data expected return can be calculated. With comparison of two return investors can analyze whether the stock is under priced or overpriced.**

### 2.2.7 Sharpe Single Index Model

**Sharpe published a model simplifying the mathematical calculations required by the Markowitz model. The Markowitz model was theoretically elegant and conceptually sound. However, conceptually its application remained several limitations. Sharpe assumes that for the sake of simplicity, the return on a security could be regarded as being linearly related to a single index like the market index. Theoretically the market index should consist of all the security trading on the market. Acceptance of the idea a market index, Sharpe argued, would obviate the need for calculating thousands of covariances between individual securities, because any movements in securities could be attributed to movement in the single underlying factor being measured by market index. The simplification of the Markowitz model has come to be known as the single index model. (Bhalla, 2005:604-605)**

**The market portfolio includes all securities, each in proportion to market value out standing. The relationship between the two excess returns can be written as:**

$$\bar{R}i - T = \alpha_i + \beta_{im}(\bar{R}m - T) + \bar{r}i$$

**Contracting the optimal portfolio the desirability of any security is directly related to its excess return to beta ratio. To determine which securities are included in the optimal portfolio, following steps are necessary.**

**Calculate the excess return to beta, ratio for each security under review and rank from highest to lowest.**

**The optimal portfolio consists of investing in all securities for which** $(\bar{R}i - T)/\beta_{im}$ **is greater than particular cut-off point C*.**

$$C^* = \frac{\sigma^2 m \sum_{i=1}^{i} \frac{(\bar{R}i - T)\beta_{im}}{\sigma^2 ei}}{1 + \sigma^2 m \sum_{i=1}^{i} \frac{\beta^2 im}{\sigma^2 ei}}$$

### 2.3 Reviews from Journals and other Related Studies

**It is necessary to address current academic workings contributed toward the field of this study. Here in this section articles from various national and international journals are reviewed and the attempt is concentrated to grab current picture of subject matter, which ultimately helps for the success of study.**

**Leading American journal (journal of finance) has thrown enough light on risk and return subject. So it is thought to be relevant to review an article from the same.**

**Theoretical relationship between systematic risk and financial variables at his article. The theoretical relationship between systematic risk and financial variables on Journal of Finance. "Robert utilized the CAPM assumption and additional assumption that corporation can borrow and lend at risk–free interest rate. He has presented theoretical relationship of systematic risk, the firm's leverage, accounting beta, earning variability, dividend or payout and growth. Shortly his findings are as follows:**

- **Systematic risk of levered firm is equal to the systematic risk of the same firm without leverage.**
- **Between earning variability and market risk there is no direct relationship.**
- **There is no any theoretical relationship between size and growth of the firm and systematic risk.**
- **There is no any theoretical relationship between dividend and systematic risk and also theoretical basis for relationship of dividend payout and beta.**
- **To the according systematic risk is directly related.**

**This study shows that there is a theoretical relationship between systematic risk and firm's accounting beta and systematic function is not a function of earning variability, dividend policies and size and growth of firm's." (Bowman 1979:617-628)**

**The study that testing the CAPM with time varying risk and return from monthly observations on total equity returns for firm's listed in NEPSE and monthly treasury bill yields. The estimation period cover 1926-1985. They used time series returns for five value-weighted portfolios as the assets priced by CAPM and the market return that they used is the CRPs value weighted market return.**

**The conditional CAPM provides a convenient way to incorporate the time varying conditional variance and covariance and allows assets risk premium vary overtime as a result of time variation in three components: The market conditional co-variance between the assets risk premium. In the conditional CAPM, an asset beta is the ratio of the conditional co-variance between assets and market returns and the conditional variance of the market's return." (Bodurtha and Mark, 1991:1418-1503)**

**In twentieth century, Philip Zorin and William N. Geotzman have studies about global stock market. To estimate for the long run**

**expected return on equity in international base is the main purpose of this study. About the implication of this study, they mention "In a famous article Mehra and Prescott (1985) argue that standard general equilibrium models cannot explain the size of the risk premium on US equities which average about 6% over the 1978/89 periods. They show that one would need a very large difference of risk aversion, largely in excess of the usual value of two to generate such a premium. This upsetting result has sparkled a flurry of theoretical research that explains alternatives performance structure; including dropping the expected utility assumption and introducing habit function." (Zorin and Goteman, 1999:95)**

**Capital appreciation index of 39 countries for the period of 1921 to 1996 is included in this study. Beyond, this global database allows us a broad investigation into the behavior of equity markets over the long run. Basically, it is based on less volatile market, about 6% annual market growth and 20% standard duration is considered in this study. To obey it, about half century of data is necessary to maintain these requirements. Approximately 76000 data points are involved in 39 markets of different countries which are taken from IFC, IMF and WPI and all are monthly based and these sources of data help to reconstruct histories for the numbers of stock markets going back early of 1920.**

**While reviewing related studies "Finance subject committee faculty of management Tribhuvan University" organized the seminar on the basis of "Emerging issues and challenges in corporate finance has mainly emphasis on the total risk pattern on joint Venture Commercial Banks (JVCBs) in Nepal.**

**The risk analysis procedures are based on the historical return of the concerned banks holding periods assumed on year. Standard deviation is calculated to measure the total risk similarly coefficient of variation is calculated for finding the best bank from the risk, return perspective further coefficient of correlation is also calculated to test the role of EPS and DPS on the market price of share, coefficient of determination is also calculated in order to explain the influence of independent variables. (i.e. EPS DPS)**

**The seminar found that the expected return in (JVCBs) ranges from 6.7% to 92.2%, which can be taken as satisfactory in such a context of declining interest rate. However the standard deviation of the observed banks ranges from 14.72% to 82.43% and from the perspectives it is cleared that the return is not consistent and there is more changes of deviation in the expected mean return.**

**In the conclusion on the basis of correlation coefficient between market price of share and DPS that there is not ay role of DPS in the variation of market price of share. It means the market price of the share of (JBVCBS) is greatly determined by other factors**

**rather than the cash dividend. On the other hand the analysis shows that there is close relationship between EPS and market price of share and 63.5% variation in market price is determined by the EPS. (Devkota and Budathoki, 2002:81-89)**

**An another article Managing Banking Risks, that various risk factors may equally be relevant for manufacturing sectors as well as in banking areas.**

**The primary function of bank is to take trade risk. Risk cannot be avoided by the banks but can only manage. But how these are managed and what type of risk exists in banking system.**

**He discuss about some of primary risk which the banking industry faces and must be point of interest only to bankers and regulators but most importantly to the depositors as well so that they can map the capacity of their banks and safeguard their hard earn money.**

Trading Market Risk: **Excess liquidity is invested on various government and corporate securities, in foreign currencies and other assets for instance swaps , option etc. Owing to the market uncertainty the value of these assets may also decline. Hence managing such investments needs experts who can predict the further return of these assets and invest the excess return smartly?**

- Credit Risk: **there are two types of credit risk. One is the diversifiable risk or the firm specific risk, which can be mitigated by maintaining an optimum and diversifiable and second, is correlated across borrowers, countries and industries, such risk not under the control of firm and banks.**
- Liquidity Risk: **it is matter of great concern for the banks to maintain sufficient liquidity in the form of hard cash or marketable securities, which can be, converted liquidity risk. The central bank has initiated various regulatory frameworks to maintain reserve in their vault and certain specific percentage of the total deposit with central bank.**
- Interest Rate Risk: **This is one of the most common risks the bank face owing to the volatility of the interest in the market. As market interest rate changes, it brings changes in expected rate of return to investors. And when investor's expected rate changes, it brings changes in stock price (and in price of other financial assets as well).Similar volatility has also been observed in case of lending interest rate as well.**

**The interest rate spread between tending and deposit is what the bank earns but with above stated volatility there is great uncertainty.**

- Off Balance Sheet Risks: **Bank often creates contingent liabilities and they are not shown in the balance sheets. Some of the examples of such off balance sheet items are as guarantor in case of default by principle of borrower in loan commitments of risk of incurring loss in forward contract due to change in price of the purchasing /selling of assets, swaps, options, commitments made in later of credit etc. Such risks are managed by a prudent analysis of the bank officials materializing such contingent contracts.**

Technology Operational Risks: **Due to the modern technology and operational efficiency modern commercial banks are among the best in terms of services, profitability and image as well. This a very small example where the government owned banks has failed, as compared to technological up gradating of other commercial banks." (Thapa, 2003:4)**

**Another articles is conducted the study on "Effect of Dividends of Common Stock Price", based on data collected for 29 companies from 1994 to 1999. This study explains the effect of dividend payment and retained earning on market price of share in the context of Nepalese companies. The purposes of the study are as follows:**

- **In the context of Nepal, to explain relationship of share price, dividend and retained earnings.**
- **Among Nepalese stockholders, to find out whether dividends or retained earning are more alternative.**
- **To examine the elasticity of dividends and for retained earnings with respect to the market price per share.**
- **On market price of share to ascertain the effect of dividend payment and retained earning.**

**He concluded and fined that:**

- **As compared to retained earning in Nepal, dividend payment is more important and if company retained earning is more the market price of share may decline.**
- **Dividends are relatively more alternative than retained earning and share price is effected by dividends.**
- **With respect to share price the elasticity of dividends is less than unity, which shows the absence of economics of scale." (Pradhan, 2003:151-157)**

## 2.4 Review of Thesis

**In this section various thesis are reviewed which are related to the topic risk and return and which may be helpful for this study. Here same thesis and dissertation are reviewed which have done on risk and return topic.**

Mr. Sundeep Upadhaya has conducted the study on "Risk and Return on Common Stock Investment of Commercial Banks in Nepal" in 2001. His study is based on five years data from financial year 1994/95 to financial year 1998/99 of eight commercial banks of Nepal. He analyzed the data in order to achieve his objectives. To assess the risk associated with returns on common stock investment of the listed commercial banks on the basis of selective financial tools were the main purpose of the study6 and to evaluate common stocks of listed commercial banks in terms of risk and return, to assess the risk compensating and to analyze the volatility of common stock and other relevant variables as an affecting factor in portfolio construction of common stocks. Due to the effect of unrealistic annual return because the issue of bonus share and increase in share price, the expected return on common stock of Nepal Grindlays Bank in maximum (127.84%), which is very high rate. Among eight commercial banks the rate of return on common stock of SBI is minimum i.e. (7.77%). The expected return of other sector is highest in the context

of industries but manufacturing and production sector is found least performer.

"High Risk High Return" it has proved in this study because it has found the common stock of NGB is most risky on the other hand the common stock of SBI is least risky. Coefficient of variation is more rational basis of investment decision and banking sectors coefficient of variation is less than that of manufacturing production and Hotel sector. In this study it shows that the stocks of commercial banks are over period. The expected rate of return of Nepal Grindlays Bank is highly greater than its required rate of return.

The Nepalese investor invests their fund on the basis of expectation and assumption of individual securities rather than analysis of the effect of portfolio who use their fund in two or more securities". (Upadhaya, 2001)

A study conducted by Shankar Kumar Mishra is some how related to this study. He conducted a thesis on the topic of "Risk and Return on Common Stock Investment of Commercial Bank in Nepal" in 2002. His objective were "to examine common stock of listed commercial bank in term of risk and return" and to identify whether stock of selected companies are over priced, under priced and equilibrium priced.

He tried to calculate risk and return of the portfolio as well as common stock and has tried to suggest some ideas. He conclude that, the risk of an assets could be measured quantitatively issuing the standard deviation and co-efficient of variation. The study is focused on the common stock of listed commercial banks. No investor will like to invest in risk assets unless he is assured of adequate compensation for the acceptance of risk. From his analysis, for risk point of view, banking sector is the best for the investment in common stock. (Mishra, 2002)

A study conducted by Nisha Shakya in "Study on Risk and Return Analysis of Common Stock investment in Finance companies" Which may help in decision making about stock investment. She has studied over five finance company companies. The specific objectives of her study to asses the general investors perception attitude and awareness towards risk associated with return, to calculated risk and return of selected securities and there portfolio and to analyzed the volatility of common stock and other valuables.

After conducted the study she come to the conclusion that the professional investors have not so sound knowledge about the stock market. Most of the investors don't know how to interpret the information and cannot make a rational decision regarding transaction of the stock and most of the investor has wrong concept theory that they believe that return of banking sector as always high. The investor's way of making portfolio is not right but aware about risk diversification. They make portfolio by investing same sector but the portfolio of same sector cannot reduce risk because they co-related positively. Most of the Nepalese investor doesn't know about correlation coefficient and they can't reduce risk by making wrong portfolio. She has taken some selected finance companies to analysis the risk and return. Among them expected return of universal finance and capital markets Ltd. is highest (18.33%) and National finance company has lowest risk i.e. (20.59%). By this investors realize that National finance company best security in term of coefficient of variation and the Kathmandu finance company has highest beta coefficient among the sample companies. So Kathmandu finance company is more volatile, riskier and aggressive than market and other sample securities. (Shakya, 2003)

A study conducted by Mr. Guna Nidhi Gautam on the topic of Risk and Return Analysis of Common Stock of Finance Companies in Nepal in 2004. The relevant objective set Mr. Gautam were to examine risk and return on common stock of finance company, to evaluate the

stock of selected companies are overpriced, under priced or equal priced. His Study was based on the period of seven years.

Mr. Gautam has given the summary of his findings as "the expected rate of return of the common stock of Narayani Finance Ltd. is highest among the selected finance companies after analyzing the available data and information using various financial and statistical tools. Similarly, expected rate of return of common stock of Peoples finance company ltd is found lowest. The total risk measured by standard deviation is observed maximum in common stock of Narayani Finance Company Ltd. common stock of citizen investment trust has highest excess return to Beta (Gautam, 2004).

Mr. Uttam Rijal (Rijal, 2005) in his MBS thesis entitled "Risk and Return Analysis of Common Stock Investment" studied the risk and return pattern of finance companies. From a 6-year data up to 2003, Mr. Rijal observed that there was variation in risk and return pattern among the sample firms and Ace Finance Company was found least risk ad indicated by low beta and low standard deviation. He had also used the Shepe's Single Index Model to construct the optimal portfolio from the given sample firms, however lacked the explanation.

# CHAPTER – III
# RESEARCH METHODOLOGY

## 3.1 Introduction

Research methodology is the systematic way of solving research problem. It refers to the overall research process, which a researcher conducts during his/her study. In this chapter research design, population and sample, sources of data, data collection technique, data analysis tools are include. A research can be conducted on the basis of primary and secondary data. In this study all the data are from secondary sources and the observed data is analyzed with using appropriate financial and statistical tools.

## 3.2 Research Design

Research design is necessary to fulfill the objectives of well-set research. It is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. A research can design in many different ways. It serves as a framework for the study, guiding the collection and analysis of data. Researcher design is the plan and structure and strategy of the investigation.

This study based on data extracted from annual reports of sample insurance companies for 6 consecutive years starting from 2059 to 2065. This study is quantitative and also analytical and descriptive research design has been used. It covers quantitative method in a greater extent and analyzes risk and return of five insurance companies in Nepal. This study also tries to analyze portfolio construction separate systematic and unsystematic risk, to find out proportion of diversified and undiversified risk.

## 3.3 Population and Sample

This study is based on the insurance companies listed in the NEPSE index. Currently there are 171 companies listed in the NEPSE. Among them 17 are insurance companies. For this study, 5 sample insurance companies are selected randomly from those which are in operation from 2059. The sample covers more than 30 percent of population.

The name list of the sample selected for the research is as follows:

| Category | Population Size | Sample Size | Name of the Sample Companies |
|---|---|---|---|
| Insurance Companies | 16 | 5 | i. Premier Insurance Company (PIC).<br>ii. Everest Insurance Company (EIC).<br>iii. Himalayan General Insurance Company (HGIC).<br>iv. National Life and General Insurance Company (NLGIC)<br>v. United Insurance Company (UIC) |

## 3.4 Sources of Data

**This study mainly based on secondary data. provided by Nepal Stock Exchange, Financial Statistics, Annual Report, and Trading Report. Other data provide by Security Board of Nepal and related companies data are taken from the companies as well as their web sites, other related books and booklets.**

## 3.5 Tools of Analysis

**To achieve the objective of research this study has used various financial and statistical tools. The related financial and statistical tools are described below which has used in to presentation and analysis of collected data.**

**Market Price of Stock (MPS)**

One of the principal measures of the value of the stock is market price of stock. It is the major data to find return on stock. In this study we used two approaches either average price (i.e. high and low) or closing price. Here in closing price is taken as the market price of the stock.

## Dividend per Share (DPS)

Dividend is that part of earning which is distributed to the shareholder. It is the portion of earning which company pays to its shareholders. Dividend per share is calculated by using the following model.

DPS = Cash Div. + Stock Div.
Cash equivalent of stock dividend = SDR× Next Year MPS

## NEPSE Index

**NEPSE index is the market index of Nepal Stock Exchange. It is used for the calculation of expected return on market. calculation of return on market, closing indeed of the particular year is considered.**

## Return on Market (Rm)

It is the percentage increase in NEPSE index. To calculate return on market we can use following relation.

$$R_m = \frac{L_t - L_{t-1}}{L_{t-1}}$$

Where,

$R_m$ = Market Return.

$L_t$ = NEPSE Index at Time Period t.

$L_{t-1}$ = NEPSE Index at Time Period t-1.

## Expected Return on Market E(rm)

Expected return on market is average return of future expectation. It is the arithmetic mean of the past years return. To calculate expected return on market we used following relationship.

$$\bar{R}m = \frac{\sum R_m}{N}$$

$\bar{R}m$ = Expected Return on Market.

$\sum R_m$ = Summation of Market Return.

N = No. of Observation.

## Return on Common Stock (Rj)

Return on Common Stock is also known as single period rate of return. It is calculated by using following formula.

$$\text{Return on Common Stock} = \frac{\text{Ending Price} - \text{Begining Price} + \text{Cash Dividend}}{\text{Begining Price}}$$

Symbolically,

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

Where,

$P_t$ = Price of Stock at a Time Period t.

$P_{t-1}$ = Price of Stock at a time Period t-1.

$D_t$ = Cash Dividend Received at a time t.

## Expected Return on Common Stock ($\bar{R}j$)

**Expected return on common stock is the future return expected by the investors of that particular stock.**

$$\bar{R}j = \frac{\sum Rj}{N}$$

Where,

$\sum$ = Sign of Summation

$R_j$ = Expected Rate of Return on Stock j.

N = Number of Years

**Standard Deviation**

Risk of market return is measured by the standard deviation of the return of market. It is the square root of the variance of the return around the mean.

$$\sigma_j = \sqrt{\frac{\sum(R_j - \bar{R}j)^2}{n-1}}$$

$\sigma_j$ = Standard Deviation of Return on Stock j.

**Coefficient of Variation (CV)**

To calculate risk per unit of expected return, we can use coefficient of variation. The formula to calculate coefficient of variation is as follows:

$$CV_j = \frac{\sigma_j}{R_j} \times 100\%$$

$CV_j$ = Coefficient of Variation on Stock j.

$\sigma_j$ = Standard Deviation on Stock j.

$R_j$ = Expected Rate of Return on Stock j.

**Correlation of Co-efficient**

It is a measure of the relative association between two variables. It describes how much liner co-movement exits between two variables. Correlation of coefficient is negative or positive which range form +1 to -1. It can be calculated as:

$$P_{ij} = \frac{Cov_{ij}}{\sigma_i \sigma_j}$$

Where, $P_{ij}$ = Correlation Co-efficient for Securities i and j.

$Cov_{ij}$ = Co-variance between Securities i and j.

$\sigma_i \sigma_j$ = Standard Deviation of Returns for Securities i and j.

Portfolio Return E(rp):

Portfolio return is the total return gained from investment on different assets. The certain portfolio is calculated by using following formula:

$E(rp) = x_i \times E(ri) + x_j \times E(rj)$

Where, E(rp) = Portfolio Return

$x_i$ = Proportion of Wealth invested in $i^{th}$ assets.

$X_j$ = Proportion of Wealth invested in $j^{th}$ assets.

E(ri) = Expected Return on $i^{th}$ assets.

E(rj) = Expected Return on $j^{th}$ assets.

**Portfolio Risk ($\sigma_p$)**

It is the risk of individual securities plus covariance between the securities. The formula for the calculation portfolio risk for two assets is given below:

$$\sigma_p = \sqrt{x_i^2 \sigma_i^2 + x_j^2 \sigma_j^2 + 2x_i x_j Cov_{ij}}$$

Where,

$\sigma_p$ = Portfolio Standard Deviation

Xi = The proportion of portfolio devoted by security i.

$\sigma_i$ = The Standard Deviation of security i.

xj = The proportion of portfolio devoted by security j.

$\sigma_j$ = The Standard Deviation of security j.

Beta Co-efficient (β)

Beta coefficient may be used for ranking the systematic risk of different assets. Beta co-efficient of a particular stock will be less than, equal or more than 1.

Symbolically,

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

Where,

$B_j$ = Beta co-efficient of Stock j.

$CovR_jR_m$ = Covariance between Return on Stock j.

$\sigma^2 m$ = Variance of Market Return.

## Analysis of Systematic and Unsystematic Risk:

Total risk of any individual stock can be measured by variance or standard deviation. The total risk can be partitioned as systematic risk and unsystematic risk.

**Systematic Risk:** Systematic risk is that portion of total risk caused by market factor that simultaneously affect the price of all securities and can not be avoided or diversified.

Symbolically,

$$\text{Systematic Risk's Proportion} = \frac{b_j^2 - \sigma_m^2}{\sigma_j^2}$$

Where,

$b_j^2$ = Square of beta of stock j.

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

$\sigma_j^2$ = Variance of Stock j.

**Unsystematic Risk:** Unsystematic risk is that portion of total risk of an individual stock, which can be diversified away. It is calculated as:

Proportion of unsystematic risk = $\frac{\text{Unsystematic Risk}}{\text{Total Risk}} = \frac{\text{Var (re)}}{\text{Var (rj)}}$

Where, Var (re) = Residual Variance

**Single Index Model**

To develop the optimal portfolio consisting of five securities of insurance companies Sharpe's single index model has been used by using the following equation. (Bhalla, 2005: 605)

$$\bar{R}i - T = \alpha_i + \beta_{im}(\bar{R}m - T) + \bar{r}i \ldots\ldots\ldots\ldots \text{(i)}$$

Where,

$\bar{R}i$ = Return on Stock

T = Risk free rate of return

$\alpha_i$ = Y intersects of characteristic line

$\beta$ = Slope coefficient or index of systematic risk

$\bar{R}m$ = Market return of based on the index number

$\bar{r}_i$ = Error term of characteristic line.

And the proportion of investment made in each stock is computed by using following equation. (Bhalla 2005, 612)

$$C_i = \frac{\sigma^2 m \sum_{i=1}^{i} \frac{(\bar{R}i - T)\beta_{im}}{\sigma^2 ei}}{1 + \sigma^2 m \sum_{i=1}^{i} \frac{\beta^2 im}{\sigma^2 ei}}$$

Where,

$\sigma^2 m$ = Variance of the market index

$\sigma^2 ei$ = variance of a security's movement of unsystematic risk.

Tools of Testing Hypothesis:

To test the set hypothesis t-test has been used.

Null Hypothesis ($H_0$): $\mu_1 = \mu_2$ i.e. there is no significant difference between overall market return and return on common stock of insurance companies.

Alternative Hypothesis ($H_1$): $\mu_1 \neq \mu_2$ i.e. there is significant difference between overall market return and return on common stock of insurance companies.

To test such hypothesis, t-test statistics has been used. t-statistic is:

$$t = \frac{\overline{X} - \mu}{\frac{S}{\sqrt{n}}}$$

Where,

t = Student's test (t) statistics.

$\mu$ = Arithmetic Mean of Population Parameter.

$\overline{X}$ = Arithmetic Mean of Sample Statistic.

**S = Sample Standard Deviation.**

n = Sample Size.

Again, if the test is test of significance of different of means, the test statistics (t) is:

$$t = \frac{\overline{X} - \mu}{S^2\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$$

Where,

$\overline{X}_1$ = Arithmetic Mean of first Sample.

$N_1$ = Fist Sample Size.

$\overline{X}_2$ = Arithmetic Mean of Second Sample.

$N_2$ = Second Sample Size.

$S_2$ = Unbiased Sample Variance of Population n.

Test Result: If calculated value is less or equal to tabulated value, the null hypothesis is accepted and vice versa.

# CHAPTER – IV

# DATA PRESENTATION AND ANALYSIS

## 4.1 Introduction

**This chapter is the main body of the study. All collected data and interpretations are included in this chapter. This part of the study analyze the risk and return of individual stock, portfolio return, correlation between firms market sensitivity and proportion of systematic risk of each security.**

**Method of analysis and presentation of collected data are used simple to understandable easily. Collected data and result are presented in tabular form and clear interpretation is also made. To make the data and results more simple and easily understandable diagram, charts have been used in this study.**

## 4.2 Analysis of Individual Company

Five insurance companies are taken as sample due to various constraints. All together 16 insurance companies are listed in NEPSE but in my study I have included only five of them as sample. Risk and return analysis of these companies individually presented and analyzed below.

This study has presented and analyzed of these company's MPS, Cash Div, Stock Div., EPS, annual return, expected return, standard deviation and C.V.

### 4.2.1 Premier Insurance Company (PIC)

### Introduction:

**Premier Insurance Company was established under the company act in 1992 A.D. (2048 B.S.) and was listed with NEPSE in 1995 A.D. (2052/05/01). The office is located at Kamaladi, Kathmandu. The authorized capital of this company is Rs. 100000000, issued capital is Rs. 60000000 and paid up capital is Rs. 30000000. The par value of share is Rs. 100 and paid up value also Rs. 100 and it has 8476 share holders according to its annual report 2064.**

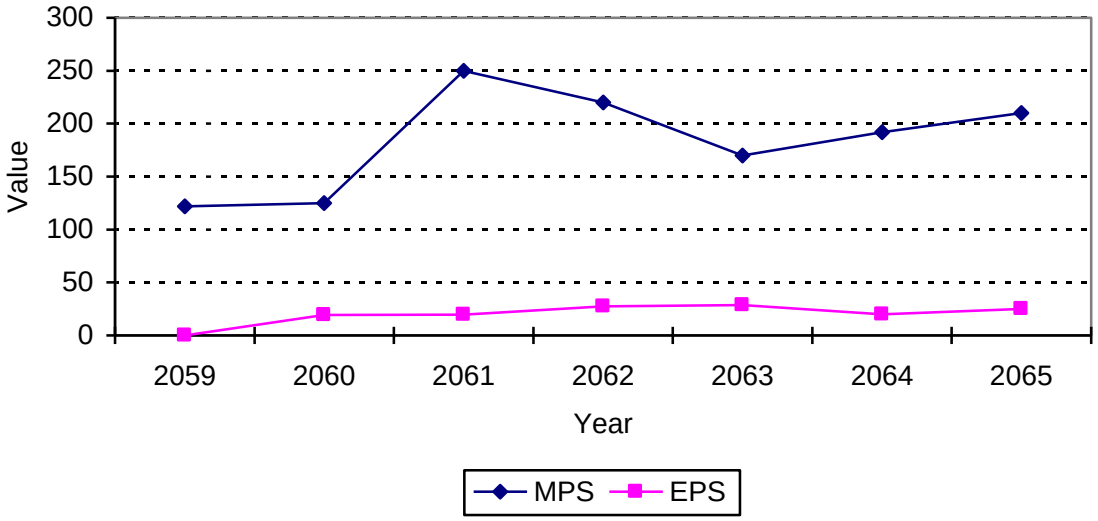
**Table : 4.1 MPS Dividend and EPS of PIC**

| Year | High MPS | Low MPS | Closing MPS | Cash Dividend | Stock Dividend | Total Dividend | EPS |
|---|---|---|---|---|---|---|---|
| 2059 | 122 | 71 | 122 | - | - | - | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2060 | 126 | 95 | 125 | 10 | 0 | 10 | 19.17 |
| 2061 | 250 | 115 | 250 | 10 | 0 | 10 | 19.70 |
| 2062 | 300 | 220 | 220 | 13 | 0 | 13 | 27.37 |
| 2063 | 230 | 154 | 170 | 10 | 0 | 10 | 28.73 |
| 2064 | 200 | 160 | 192 | 10 | 0 | 10 | 19.90 |
| 2065 | 210 | 192 | 210 | - | - | - | 25.13 |

Source: Trading Report, Financial Statistics of Security Board and Company's Annual Report.

**Figure:4.1 Year End MPS and EPS Movement of PIC**




Market price, dividend and EPS of common stock of PIC are shown in above table no. 4.1. Trend of closing price and EPS has shown in above diagram. Above data shows that closing MPS of PIC is in increasing trend from 2059 to 2061 than it has started to decrease from Rs. 220 in the year 2062 again decrease to Rs. 170 in the year 2063 than slight increase trend throughout the observed year.

Similarly, EPS shows increasing trend except in the year 2064 it has decreased. And again it is increased in 2064. The highest EPS is Rs. 28.73 in the year 2064 and lowest is at Rs. 19.17 in the year 2065.

The above table also shows that amount of dividend constant in the year 2052 to 2061 i.e. Rs. 10 then increase to Rs. 13 in the year 2064 then again come to Rs. 10 though the observed year and the company doesn't declared any dividend in the year 2065.

Table: 4.2 Annual Return, Expected Rate of Return Standard Deviation and Coefficient of Variation of PIC

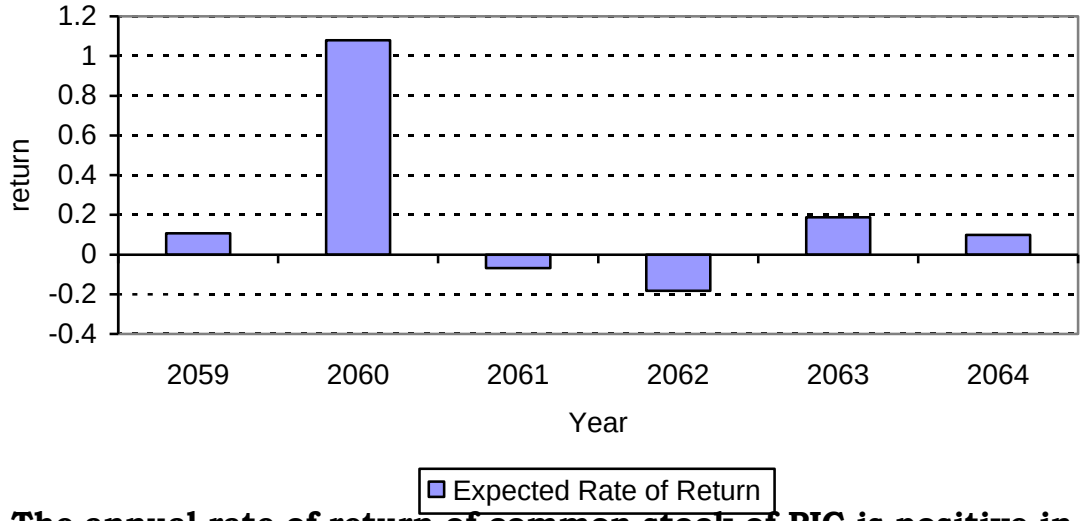
| Year | Closing Price | Total Dividend | R= $\frac{(P_t - P_{t-1}) + D_t}{P_{t-1}}$ | (R- $\bar{R}$ ) | (R- $\bar{R}$ )² |
|---|---|---|---|---|---|
| 2059 | 122 | - | - | - | - |
| 2060 | 125 | 10 | 0.107 | -0.0965 | 0.0093 |
| 2061 | 250 | 10 | 1.080 | 0.8770 | 0.7689 |
| 2062 | 220 | 13 | -0.068 | -0.2711 | 0.0735 |
| 2063 | 170 | 10 | -0.182 | -0.3851 | 0.1483 |
| 2064 | 192 | 10 | 0.188 | -0.0151 | 0.0002 |
| 2065 | 210 | - | 0.094 | -0.1093 | 0.0119 |
| | | | ΣR = 1.2184 | | 1.0122 |

Expected Rate of Return $\left(\bar{R}\right) = \frac{\sum R}{N} =$ 0.2031

Standard Deviation $(\sigma) = \sqrt{\frac{\sum (R - R)^2}{n-1}} =$ 0.450

$C.V. = \frac{\sigma}{\bar{R}} =$ 2.2157

**Figure: 4.2 Annual Return of Common Stock of PIC**




**The annual rate of return of common stock of PIC is positive in the year 2060, 2061, 2062 and 2063 negative in the year 2062 and 2063. The highest return of PIC is 1.08 in the year 2061 and lowest return is –0.068 i.e. in the year of 2062. Such variation on stock return is the function of stock price movement throughout the sample period. And the stock price depends on the economic variables as well as extra economic variables (e.g. political crises, bull and bear trend in stock market, etc.). The highest return 108% in year 2061 indicates the favorable outcome to the investors whereas -6.8% indicates the unfavorable.**

### 4.2.2 Everest Insurance Company (EIC)

**Introduction:**

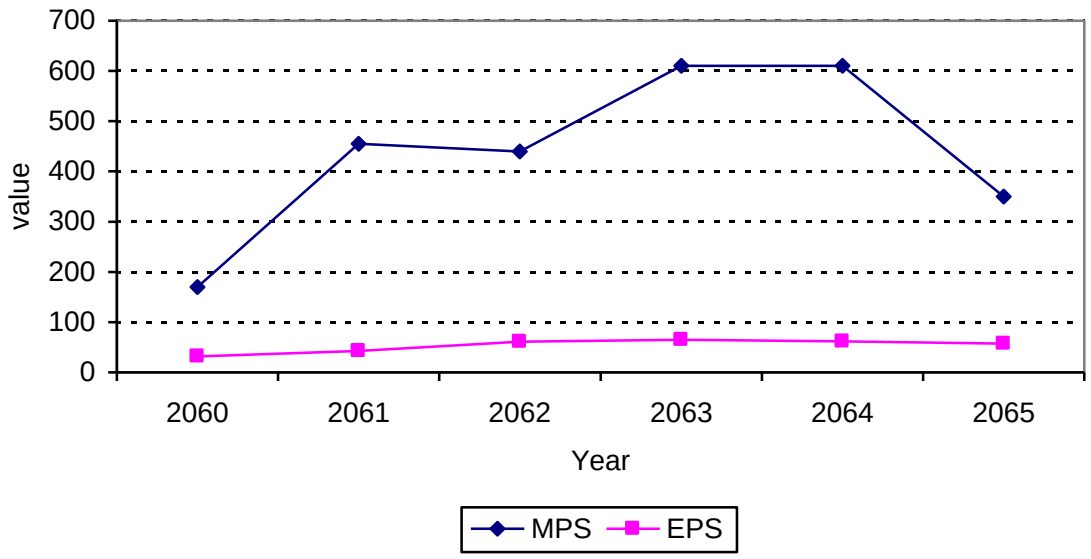
Everest Insurance Company is an insurance company, which established in the year 1992 (2048 B.S.). The office listed in NEPSE on 12/20/51 B.S. (1995A.D.). The major objective of the company is the carry out life and non-life insurance business in the country. The authorized capital of this company is Rs. 100,000,000, issued capital of Rs. 30,000,000 and paid up capital of Rs. 30000,000. The paid up value per share of EIC is Rs. 100 and par value per share is also Rs. 100 and it has 8326 shareholders according to its annual report 2065.

**Table: 4.3 MPS, Dividend and EPS of EIC**

| Year | High MPS | Low MPS | Closing MPS | Cash Dividend | Stock Dividend | Total Dividend | EPS |
|---|---|---|---|---|---|---|---|
| 2059 | 175 | 115 | 175 | - | - | - | - |
| 2060 | 170 | 121 | 170 | 10 | 0 | 10 | 31.51 |
| 2061 | 510 | 170 | 455 | 20 | 0 | 20 | 42.90 |
| 2062 | 545 | 400 | 440 | 20 | 0 | 20 | 61.07 |
| 2063 | 620 | 400 | 610 | 20 | 0 | 20 | 65.20 |
| 2064 | 620 | 420 | 610 | 10 | 0 | 10 | 61.74 |
| 2065 | 651 | 350 | 350 | - | - | - | 57.22 |

Source: Trading Report, Financial Statistics of Security Board and Company's Annual Report.

**Figure: 4.3 Year End MPS and EPS Movement of EIC**



Market price, dividend and EPS of common stock of EIC are shown in above table. Trend of MPS and EPS has shown in above diagram. Above table shows that closing MPS of EIC is fluctuating nature and it is obvious because market price of the stock is function of so many external factors, for example, stock market trend, political crisis, stick and so on. The MPS of EIC is in increasing trend during some year and it has decreased in the year 2062 and again increase and constant in the F/Y 2063 and 2064. i.e. Rs. 610 and again it has decreased in the year 2065 i.e. 350. EPS is also increasing trend up to 2063 then it is in decreasing trend through out the observed year. The highest EPS is Rs. 65.20 in the year 2063 and the lowest EPS is Rs. 31.51 i.e. in the year 2060.

It is revealed interestingly that in one hand EPS is found increasing where is MPS is found decreasing or more fluctuating. It implies that there is less impact of EPS on MPS. In general, it is assumed that higher EPS leads to higher MPS.

The above table also shows that the company declared dividend at Rs. 10 in the year 2062 and then constant value i.e. Rs. 20 for 3 years of observed period then in 2064 has decreased. The company didn't declared any dividend in the year 2065. The highest dividend is at 20 in three years from 2061 to 2063 and lowest is at Rs. 10.

**Table: 4.4 Annual Return, Expected Rate of Return Standard Deviation and Coefficient of Variation of EIC**

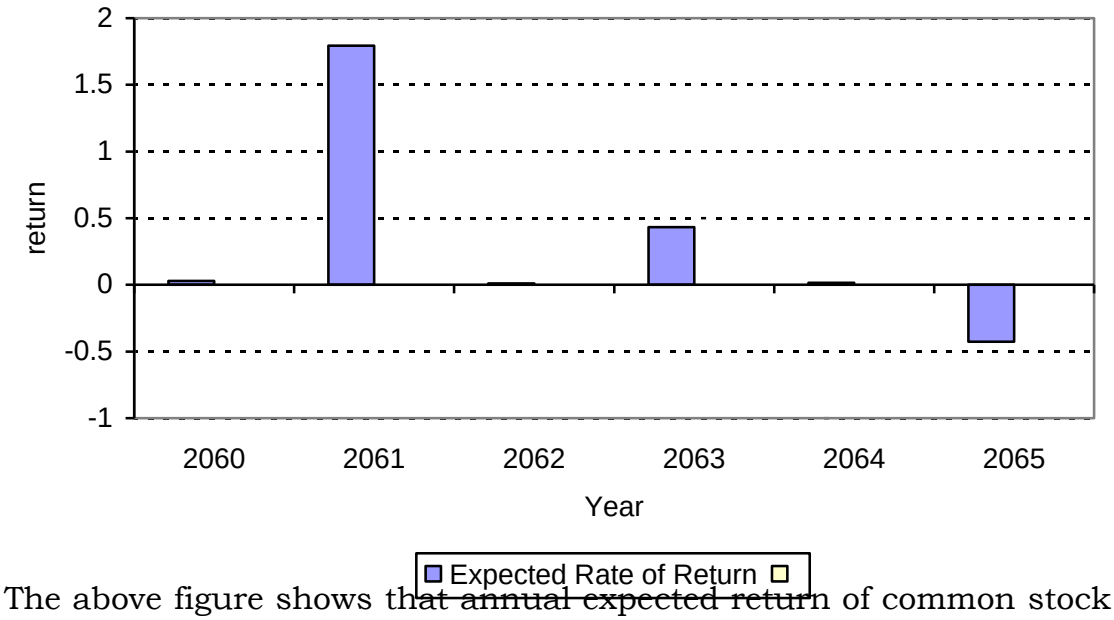
| Year | Closing Price | Total Dividend | R= $\frac{(P_t - P_{t-1}) + D_t}{P_{t-1}}$ | (R- $\bar{R}$ ) | (R- $\bar{R}$ )² |
|---|---|---|---|---|---|
| 2059 | 175 | - | - | - | - |
| 2060 | 170 | 10 | 0.02867 | -0.2807 | 0.0788 |
| 2061 | 455 | 20 | 1.7941 | 1.4848 | 2.2046 |
| 2062 | 440 | 20 | 0.011 | -0.2983 | 0.0890 |
| 2063 | 610 | 20 | 0.4318 | 0.1225 | 0.0150 |
| 2064 | 610 | 10 | 0.0164 | -0.2929 | 0.0858 |
| 2065 | 350 | - | -0.4262 | -0.7355 | 0.5410 |
| | | | ΣR 1.8557 | | 3.0142 |

Expected Rate of Return ($\bar{R}$) = $\frac{\sum R}{N} = \frac{1.8557}{6} = 0.3093$

Standard Deviation ($\sigma$) = $\sqrt{\frac{\sum(R-\bar{R})^2}{n-1}} = \sqrt{\frac{3.0142}{6-1}} = 0.7764$

C.V. = $\frac{\sigma}{\bar{R}} = \frac{0.7764}{0.30931} = 2.5102$

**Figure: 4.4 Annual Return of Common Stock of EIC**




The above figure shows that annual expected return of common stock of EIC is positive in all year except the year 2064. It is high in the year 2060 i.e. 1.7941 (179.41%) and lowest in the year 2064 i.e. negative return -0.4262 (42.62%). This evidence indicates higher price sensitivity of EIC stock as signified by higher standard deviation and CV. In the year 2059, 2061, and 2063, the annual returns are revealed very low and even negative in the year 2064 which indicates unfavorable outcome to the investors. Whereas in the year 2060 and 2062 the returns are substantially high. It is the consequences of the adverse stock market moments and its impact on EIC stock price

### 4.2.3 Himalayan General Insurance Company (HGIC)

**Introduction:**

HGIC was established under the company act in 1988A.D. (2044 B.S.) and was listed in NEPSE on 10/13/50 (1994A.D.). The objective of the company is undertaking non-life and re-insurance business from insurance board under insurance act 1992 and started its business from November 1993 A.D.

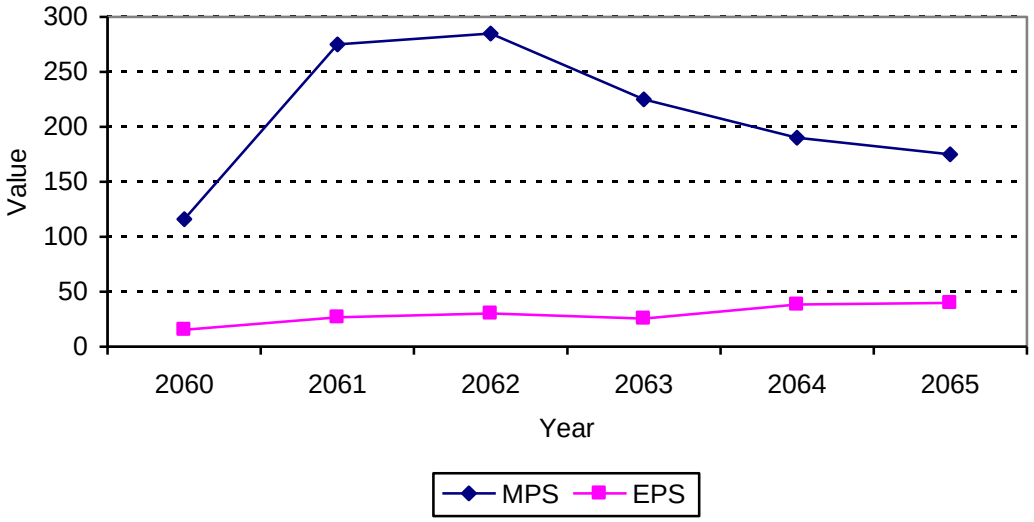
The authorized capital of this company is Rs. 80000000, issued capital is Rs. 30000000 and paid up capital Rs. 30000000. The paid up value of per share is Rs. 100 and par value is also Rs. 100. And it has 1882 share holders according its annual report.

**Table: 4.5 MPS, Dividend and EPS of HGIC**

| Year | High MPS | Low MPS | Closing MPS | Cash Dividend | Stock Dividend | Total Dividend | EPS |
|---|---|---|---|---|---|---|---|
| 2059 | 99 | 72 | 95 | - | - | - | 15.43 |
| 2060 | 116 | 90 | 116 | 10 | 0 | 10 | 26.63 |
| 2061 | 288 | 116 | 275 | 15 | 0 | 15 | 30.30 |
| 2062 | 310 | 235 | 285 | 15 | 0 | 15 | 25.50 |
| 2063 | 280 | 225 | 225 | 10 | 0 | 10 | 38.40 |
| 2064 | 205 | 175 | 190 | 10 | 0 | 10 | 39.87 |
| 2065 | 190 | 165 | 175 | - | - | - | |

Source: Trading Report, Financial Statistics of Security Board and Company's Annual Report.

**Figure: 4.5 Year End MPS and EPS Movement of HGIC**



Market price, dividend and EPS of commons stock of HGIC are shown in above table no. 4.5. Trend of MPS and EPS has shown in above figure. The above data shows that MPS of HGIC is in increasing trends up to 2060 to 2062. Then it is in decreasing trend through the observed year. The highest MPS is 285 in the year 2062 and lowest MPS is Rs. 116 in the year 2060.

EPS is also increasing trend up to 2062. It has decreased in the year 2063 and again increased in throughout the observed year. The highest EPS is 39.87 i.e. in the 2064 and lowest is Rs. 15.43 in the year 2060.

Again, in the case of HGIC, EPS is revealed as increasing slightly but MPS has been observed decreasing. It could be the consequences of political crisis during the period and its impact of the stock price.

The above table also shows the dividend. It is in Rs. 10 in the year 2060 and then constant value Rs. 15 in 2 years then again it has decreased in the year 2063 to 2064. The company hasn't declared any dividend in the year 2065.

Table: 4.6 Annual Return, Expected Rate of Return, Standard Deviation, Coefficient of Variation of HGIC

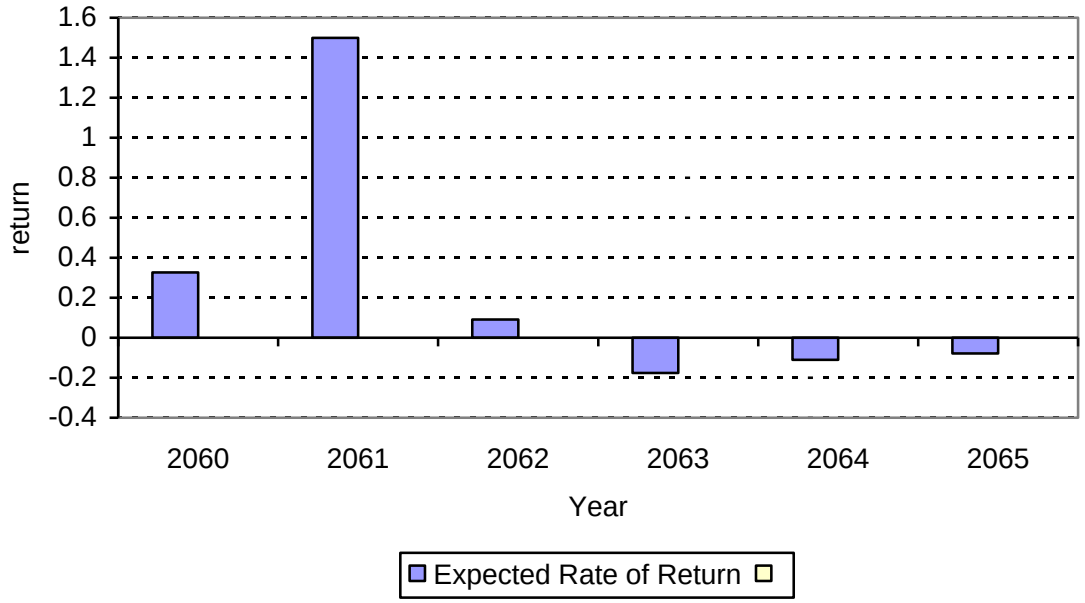
| **Year** | **Closing Price** | **Total Dividend** | **R=** $\frac{(P_t - P_{t-1}) + D_t}{P_{t-1}}$ | **(R-** $\bar{R}$ **)** | **(R-** $\bar{R}$ **)²** |
|---|---|---|---|---|---|
| 2059 | 95 | - | - | - | - |
| 2060 | 116 | 10 | 0.326 | 0.0674 | 0.0045 |
| 2061 | 275 | 15 | 1.50 | 1.2414 | 1.5412 |
| 2062 | 285 | 15 | 0.091 | -0.1676 | 0.6281 |
| 2063 | 225 | 10 | -0.1754 | -0.434 | 0.1884 |
| 2064 | 190 | 10 | -0.1111 | -0.3697 | 0.1367 |
| 2065 | 175 | - | -0.0789 | -0.3375 | 0.1139 |
| | | | ΣR = 1.2184 | | 2.0128 |

Expected Rate of Return ( $\bar{R}$ **)** = $\frac{\sum R}{N} = \frac{1.5516}{6} = 0.2586$

Standard Deviation ($\sigma$) = $\sqrt{\frac{\sum(R-\bar{R})^2}{n-1}}$ = $\sqrt{\frac{2.0128}{6-1}}$ =0.6345

C.V. = $\frac{\sigma}{\bar{R}}$ = $\frac{0.6345}{0.2586}$ = 2.4535

**Figure: 4.6 Annual Return of Common Stock of HGIC**




The above figure shows the annual return of HGIC. The annual return of HGIC is positive in the Year up to 2062 then it is in negative through out the observed year. The highest return is 150% in the year 2062 and negative return from year 2063 to 2065. Such negative return is unfavorable to investors and may not to attractive investment to the investors. As investors prefer higher return, they choose the stocks having higher return. HGIC, hence could not be attractive stock to the investors. However, during the period, the stock market was in declining trend the most of the stocks' price were declining because of adverse macroeconomic scenario and political crises.

### 4.2.4 United Insurance Company (UIC)

**Introduction:**

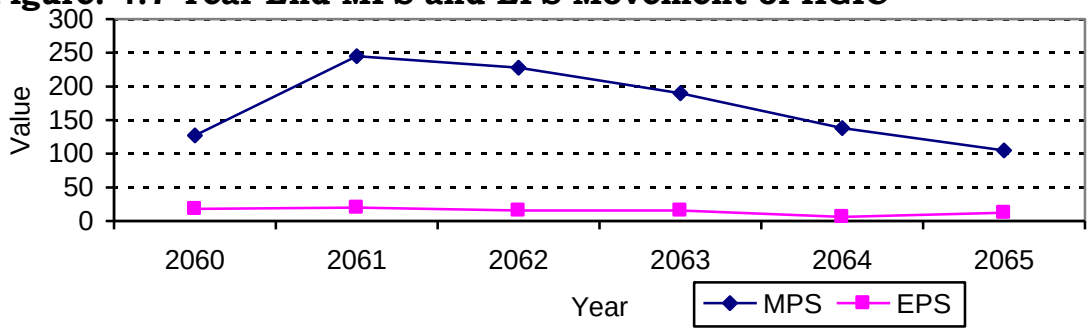
United Insurance is an insurance company, which established in 1992A.D. (2049 B.S.) with an objective of providing non-life insurance in the field of fire, machine, vehicle and miscellaneous insurance. The company was listed on NEPSE in the year 1994 A.D. i.e. (51/01/17B.S.). The authorized capital of this company is Rs. 10 million, issued capital is Rs. 6 million and paid up capital is Rs. 56621500. The paid up value per share of UIC is Rs. 50 and par value of share is Rs. 100 and it has 4932 shareholders.

**Table: 4.7 MPS, Dividend and EPS of UIC**

| Year | High MPS | Low MPS | Closing MPS | Cash Dividend | Stock Dividend | Total Dividend | EPS |
|---|---|---|---|---|---|---|---|
| 2059 | 107 | 90 | 101 | - | - | - | - |
| 2060 | 130 | 0 | 127 | 10 | 0 | 10 | 18.03 |
| 2061 | 295 | 121 | 245 | 10 | 0 | 10 | 19.72 |
| 2062 | 335 | 220 | 228 | 8 | 0 | 8 | 15.65 |
| 2063 | 240 | 160 | 190 | 15 | 0 | 15 | 15.69 |
| 2064 | 185 | 120 | 138 | 10 | 0 | 10 | 5.97 |
| 2065 | 132 | 105 | 105 | - | - | - | 12.38 |

Source: Trading Report, Financial Statistics of Security Board and Company's Annual Report.

**Figure: 4.7 Year End MPS and EPS Movement of HGIC**




Market price dividend and EPS of common stock of UIC are shown in above table 4.7. Trend of MPS and EPS has shown in figure. Above data shows that MPS of UIC is in increasing trend up to 2061 than it is in decreasing trend throughout the observed year. The highest MPS is Rs. 245in the year 2061 and lowest is Rs. 105 in the year 2065. EPS of UIC shows fluctuating character and almost consistent

throughout the study period. EPS is highest at Rs. 19.72 in the FY 2061 and lowest in the year 2064 at Rs. 5.97. The scenario is as described by financial theories that means, as EPS increases it leads to higher stock price and vice versa.

Similarly, dividend shows that constant value at Rs. 10 except in the FY 2062 and 2063 and Rs. 8 in the year 2062 Rs. 15 in the 2063. The highest dividend is Rs. 15 in the FY 2063 and lowest is Rs. 8 in the year 2062.

**Table: 4.8 Annual Return, Expected Return, Standard Deviation and Coefficient of Variation of UIC**

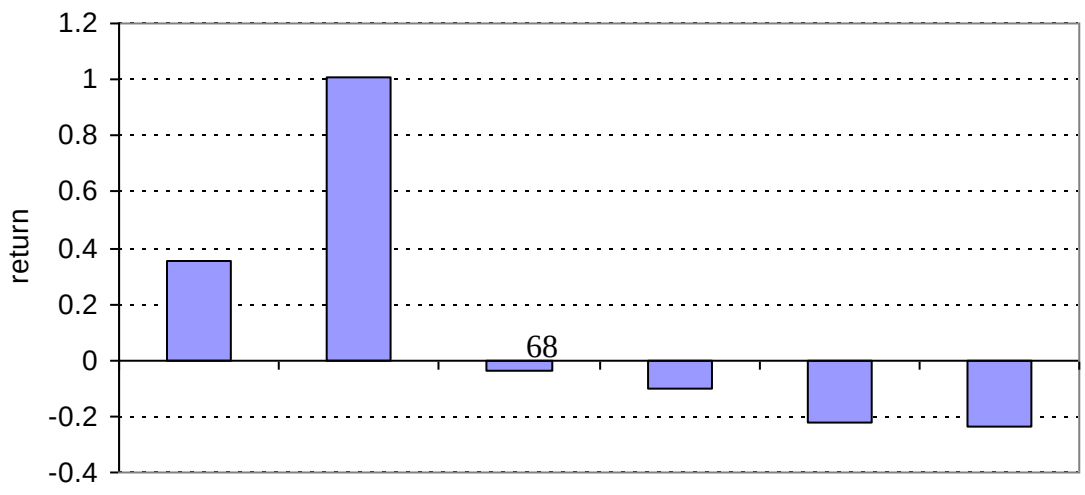
| Year | Closing Price | Total Dividend | R= $\frac{(P_t - P_{t-1}) + D_t}{P_{t-1}}$ | (R- $\bar{R}$ ) | (R- $\bar{R}$ )² |
|---|---|---|---|---|---|
| 2059 | 101 | - | - | - | - |
| 2060 | 127 | 10 | 0.3564 | 0.2288 | 0.0523 |
| 2061 | 245 | 10 | 1.0079 | 0.8803 | 0.7749 |
| 2062 | 228 | 8 | -0.0367 | -0.1643 | 0.027 |
| 2063 | 190 | 15 | -0.1009 | -0.2285 | 0.0522 |
| 2064 | 138 | 10 | -0.2211 | -0.3487 | 0.1216 |
| 2065 | 105 | - | -0.2391 | -0.3667 | 0.1345 |
| | | | ΣR = 0.7665 | | 1.1625 |

Expected Rate of Return ($\bar{R}$) = $\frac{\sum R}{N} = \frac{0.7665}{6} = 0.1276$

Standard Deviation ($\sigma$) = $\sqrt{\frac{\sum(R-\bar{R})^2}{n-1}} = \sqrt{\frac{1.1625}{6-1}} = 0.4822$

C.V. = $\frac{\sigma}{\bar{R}} = \frac{0.4822}{0.1276} = 3.779$

**Figure: 4.8 Annual Return of Common Stock of UIC**



**The above diagram shows that the annual rate of return of UIC which is positive in starting two years and negative in other four years. The highest return is 100.79% in the year 2061 and lowest is -23.91% in the year 2065. Again, the return pattern of UIC is revealed as HGIC. It seems that the adverse effect in stock market has very high impact on the UIC stock's return. The negative return on stock has increased over the years from 2062 to 2065. The investors lost from their investment.**

### 4.2.5 National Life and General Insurance Company (NLGIC)

Introduction:

**National life and general insurance company limited was established in 1985A.D. under the company act 1964. The main objective of the company is to provide insurance services in the field of life and non-life sector. The authorized capital of the company is Rs. 20000000 and paid up capital is Rs. 19985840. The par value of share is Rs. 100, paid up value is also 100 and it has 3381 shareholders.**

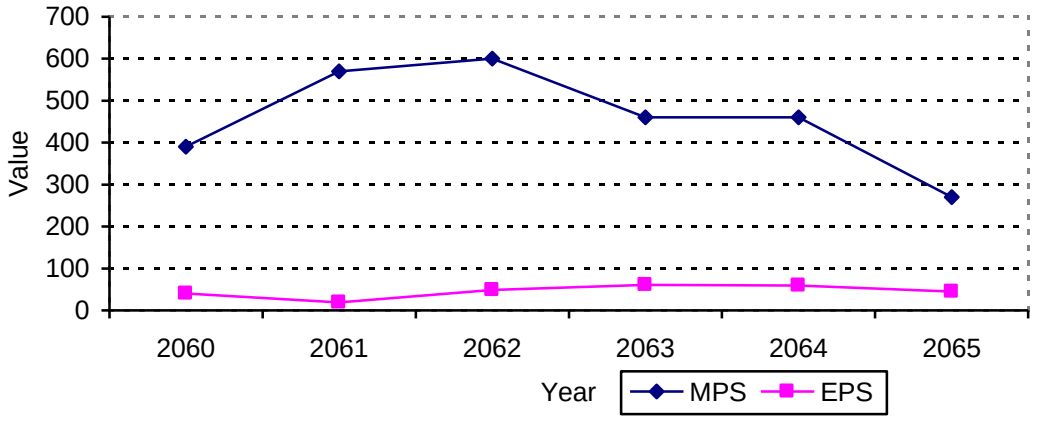
**Table: 4.9 MPS, Dividend and EPS of NLGIC**

| Year | High MPS | Low MPS | Closing MPS | Cash Dividend | Stock Dividend | Total Dividend | EPS |
|---|---|---|---|---|---|---|---|
| 2059 | 307 | 250 | 305 | - | - | - | - |
| 2060 | 390 | 275 | 390 | 20 | 0 | 20 | 40.22 |
| 2061 | 620 | 381 | 570 | 20 | 0 | 20 | 18.93 |
| 2062 | 740 | 500 | 600 | 20 | 0 | 20 | 48.77 |
| 2063 | 600 | 375 | 460 | 10 | 0 | 10 | 60.53 |
| 2064 | 480 | 400 | 460 | 10 | 0 | 10 | 59.03 |
| 2065 | 437 | 270 | 270 | - | - | - | 45.13 |

Source: Trading Report, Financial Statistics of Security Board and Company's Annual Report.

MPS, dividend and EPS of NLGIC are shown in above table 4.9. Trend of MPS and EPS also shown in diagram. Above data shows MPS of NLGIC is in increasing trend up to 2062, then it is constant in up to 2064 and again it has decreased in the year 2065. The high MPS is Rs. 600 in the FY 2062 and low is Rs. 270 i.e. in FY 2065. EPS of NLGIC shows fluctuating nature. It is decreased in the year 2060 and again increasing trend from 2062 to 2063 then again it has decreased. The highest EPS of NLGIC is Rs. 60.53 in the year 2063 and lowest one is 18.93 i.e. in the year 2061.

**Figure: 4.9 Year End MPS and EPS Movement of NLGIC**




Similarly, the company declared dividend Rs. 20 in the beginning of 3 years and has decreased to Rs. 10 in the last 2 years i.e. 2062 to 2063. The company has not declared any dividend in the year 2064.

Table: 4.10 Annual Return, Expected Return, Standard Deviation and Coefficient of Variation of NLGIC

| Year | Closing Price | Total Dividend | R= $\frac{(P_t - P_{t-1}) + D_t}{P_{t-1}}$ | (R- $\bar{R}$ ) | (R- $\bar{R}$ )² |
|---|---|---|---|---|---|
| 2059 | 305 | - | - | - | - |
| 2060 | 390 | 20 | 0.3443 | 0.2882 | 0.0830 |
| 2061 | 570 | 20 | 0.5128 | 0.4567 | 0.2085 |
| 2062 | 600 | 20 | 0.0877 | 0.0316 | 0.00099 |

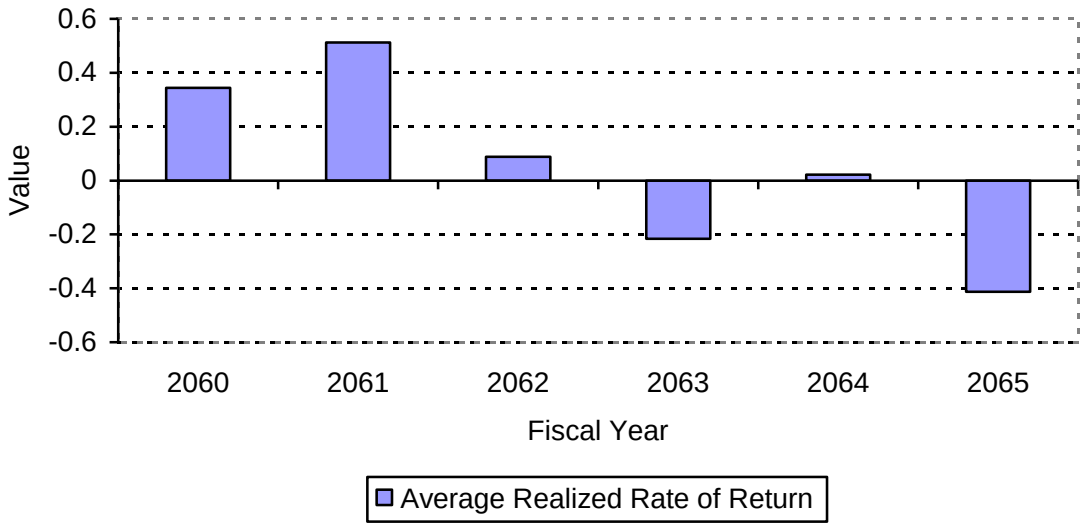
| | | | | | |
|---|---|---|---|---|---|
| 2063 | 460 | 10 | -0.2167 | -0.2729 | 0.0744 |
| 2064 | 460 | 10 | 0.0218 | -0.0344 | 0.0012 |
| 2065 | 270 | - | -0.4130 | -0.4692 | 0.2201 |
| | | | ΣR = 0.3369 | | 0.58819 |

Expected Rate of Return ($\bar{R}$) = $\frac{\sum R}{N} = \frac{0.3369}{6} = 0.05615$

Standard Deviation ($\sigma$) = $\sqrt{\frac{\sum(R-\bar{R})^2}{n-1}} = \sqrt{\frac{0.58819}{6-1}} = 0.3430$

C.V. = $\frac{\sigma}{\bar{R}} = \frac{0.3430}{0.05615} = 6.12$

**Figure: 4.10 Annual Return of Common Stock of NLGIC**




The above figure shows the annual expected return of common stock of NLGLC. The annual return is positive in all observed year except in the Year 2063 and 2065 which is negative i.e. –21.67% and –41.3% respectively. The highest return is 51.28% in the year 2061 and lowest at –41.3 in the year 2065. In the initial years of sample period, the stock has positive and higher return whereas in latter years the trend is inverse; stock's return has been decreasing. The higher coefficient of variation (6.12) indicates higher variability of the stock's return.

## 4.3 Comparative Analysis

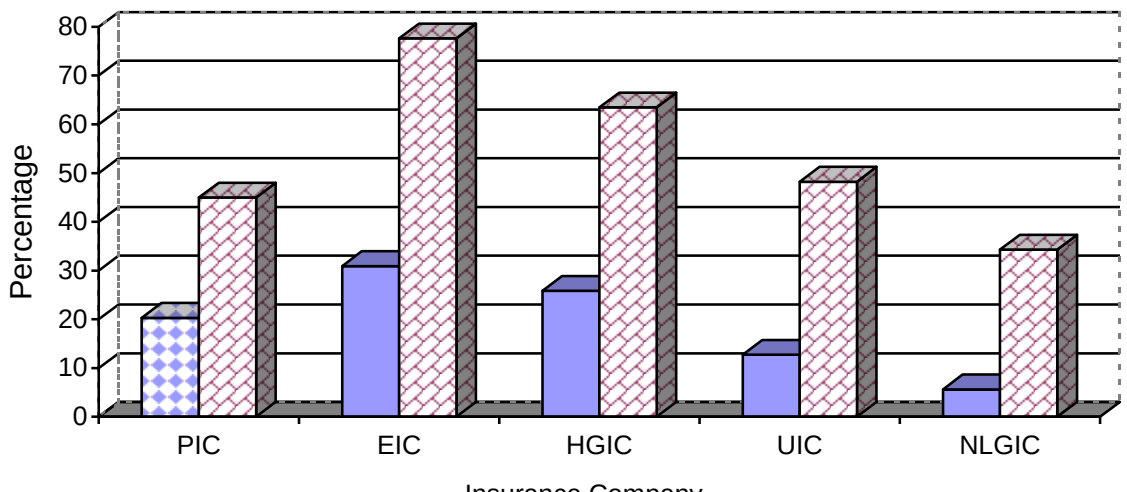
After analyzing the expected return, standard deviation and coefficient of variation the results are shown in table no. 4.11

**Table: 4.11 Expected Return Standard Deviation and Coefficient of Variation of Five Samples Insurance Company**

| S.N. | Companies | Expected Return | S. D. | C.V | Remarks | | |
|---|---|---|---|---|---|---|---|
| | | | | | Return | Risk | C.V. |
| 1 | PIC | 20.31% | 45% | 2.2157 % | | | Lowest |
| 2 | EIC | 30.93% | 77.64 % | 2.5102 % | Highest | Highest | |
| 3 | HGIC | 25.86% | 63.45 % | 2.4535 % | | | |
| 4 | UIC | 12.76% | 48.22 % | 3.779% | | | |
| 5 | NLGIC | 5.62% | 34.30 % | 6.12% | Lowest | Lowest | Highest |

The above table shows that expected return and S.D. of EIC are higher than other sample insurance companies. NLGIC has lowest return and lowest risk among others. But C.V. is useful when two or more investment have different return and different risk. C.V. measures the risk per unit. C.V. of common stock of PIC is minimum than other insurance companies. The minimum C.V. the lesser the risk. To earn one unit of return an investor has to bear 2.2157 unit of risk, by investing in PIC. Therefore PIC has least C.V. i.e. 2.2157 it can be considered best for investment purpose.

Figure: 4.11 Expected Return, and Standard Deviation of Sample Insurance Company

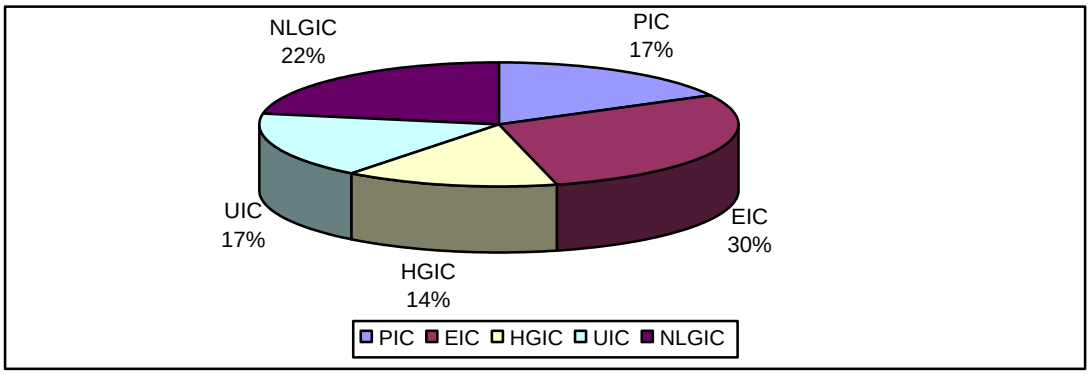


## 4.4 Market Capitalization of Sample Insurance Companies

Table: 4.12 Market Capitalization of Sample Insurance Companies at FY 2064

| Name of Company | MKT Capitalization in Million | Percentage |
|---|---|---|
| PIC | 63.00 | 17.28% |
| EIC | 105.00 | 28.81% |
| HGIC | 52.50 | 14.40% |
| UIC | 63.00 | 17.28% |
| NLGIC | 81.00 | 22.22% |
| Total | 364.50 | 100% |

Figure: 4.12 Company-Wise Market Capitalizations of Sample Insurance Companies




On the basis of market capitalization of selected insurance company, we can conclude that EIC is the biggest insurance company and HGIC is the smallest insurance company. EIC covers 28.81% of total market where as HGIC covers only 14.40% of total market.

## 4.5 Analysis of Market Risk and Return

As we know that the only one stock market of Nepal is Nepal stock exchange (NEPSE). NEPSE index represents the overall market

movement. To calculate expected return market, market risk of particular year is considered. Annual return, expected return, Standard deviation and coefficient of variation of overall market are presented below:

**Table: 4.13 Market Return its Standard Deviation and Coefficient of Variation**

| Year | NEPSE Index NI | $R_m = \frac{(L_t - L_{t-1})}{L_{t-1}}$ | $R_m - \bar{R}_m$ | $(R_m - \bar{R}_m)^2$ | Remarks |
|---|---|---|---|---|---|
| 2059 | 163.35 | - | - | - | - |
| 2060 | 216.92 | 0.3279 | 0.2289 | 0.0524 | |
| 2061 | 360.70 | 0.6628 | 0.5638 | 0.3179 | |
| 2062 | 348.43 | -0.0340 | -0.133 | 0.0177 | |
| 2063 | 227.54 | -0.3470 | -0.446 | 0.1989 | |
| 2064 | 204.86 | -0.0997 | -0.1987 | 0.0395 | |
| 2065 | 222.04 | 0.0839 | -0.0151 | 0.0002 | |
| | | $\Sigma R_m$=0.5939 | | 0.6266 | |

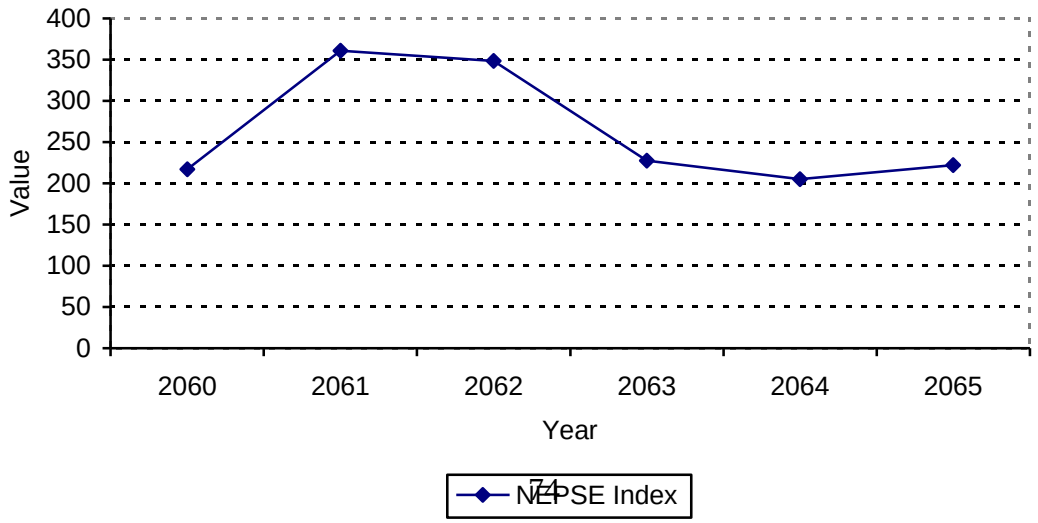
*Source: SCBO, Annual Report 2007.*

Expected Return ($\bar{R}_m$) = $\frac{\sum R_m}{N} = \frac{0.5939}{6}$ = 0.0990 or 9.90%

S.D. ($\sigma_m$) = $\sqrt{\frac{\sum (R_m - \bar{R}_m)^2}{n-1}} = \sqrt{\frac{0.6266}{6-1}}$ = 0.354

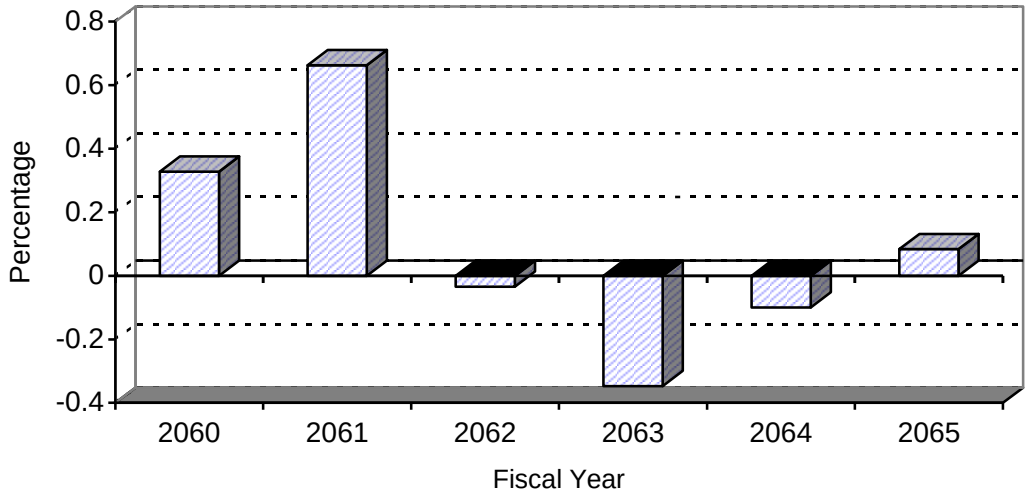
C.V. = $\frac{\sigma}{\bar{R}} = \frac{0.354}{0.099}$ = 3.58

**Figure: 4.13 Movement of NEPSE Index**



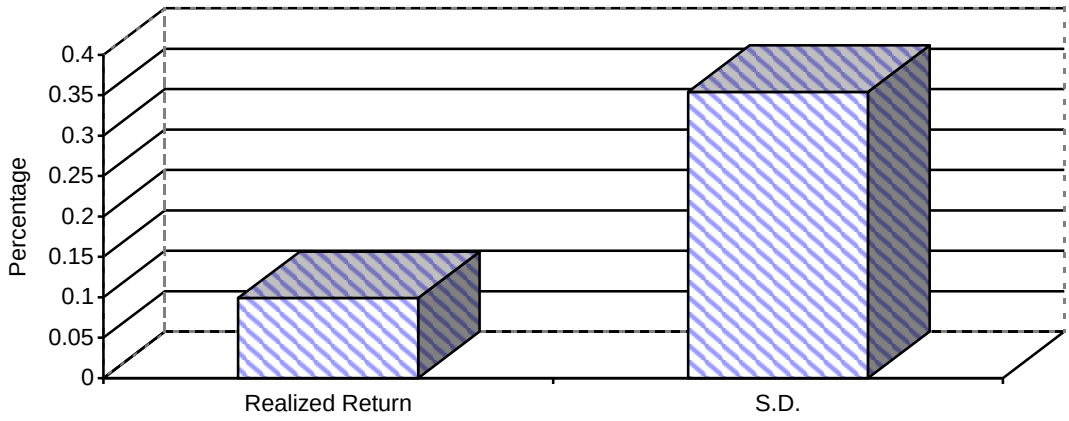
**Index of Nepal Stock Exchange of various years is shown in diagram 4.13. Above diagram shows that NEPSE index in increasing trend up to year 2061 than it is in decreasing trend up to year 2064 and in the year 2065 again it has increased. The highest index is in the year 2061 and lowest is in the 2064.**

**Figure: 4.14 Annual Return on Market**




**Above diagram shows that annual return on market is positive in three years and negative is also in three years. Annual market return most positive in year 2061 and most negative in the year 2063.**

**Figure: 4.15 Expected Return, S.D. and C.V. of Market**



Above diagram shows that expected return on market is only 9.9% and risk is 35.4% so C.V. or risk per unit of market is very high.

## 4.6 Portfolio Diversification Analysis

Portfolio theory was proposed by Harry M. Markowitz which gives the concept of diversification of risk by investing total funds in more than a single assets or single stock. This theory helps the investor obtain a higher level of expected utility than with any other risk reduction technique. In a very simple way we can understand it as keeping all eggs in a single basket. By diversifying total fund in different securities the risk of individual security can be reduced with out loosing considerable return. The main aim of portfolio is reduction of unsystematic risk from which investors can take more benefit by making efficient portfolio.

Portfolio is combination of assets. This analysis is based on two assets portfolio since the investment theories advocate that higher the risk trends to have higher the return. The portfolio theory says that investing in different securities helps to minimize the risk maintaining the optimal return. In this section two-assets portfolio have been developed and EIC has been selected as non-replacing security because it has the highest risk and highest return.

To calculate portfolio return and risk, we have to calculated co-variance between two securities. Table 4.14 shows that the calculation of covariance of return of common stock of EIC and PIC.

**Table: 4.14 Calculation of Cov. ($R_{EIC}$. $R_{PIC}$)**

| FY | $(R_{EIC}-\bar{R}_{EIC})$ | $(R_{PIC}-\bar{R}_{PIC})$ | $(R_{EIC}-\bar{R}_{EIC})(R_{PIC}-\bar{R}_{PIC})$ |
|---|---|---|---|
| 2060 | –0.2807 | -0.0965 | 0.0271 |
| 2061 | 1.4848 | 0.877 | 1.3022 |
| 2062 | –0.2983 | -0.2711 | 0.0809 |
| 2063 | 0.1225 | -0.3851 | –0.0472 |
| 2064 | –0.2929 | -0.0151 | 0.0044 |
| 2065 | –0.7353 | -0.1093 | 0.0804 |

| | | | |
|---|---|---|---|
| **Total** | | | 1.4478 |

[Data source table no. 4.2 & 4.4]

We have,

$$\text{Cov. } (R_{EIC}, R_{PIC}) = \frac{\sum\left[\left(R_{EIC} - \bar{R}_{EIC}\right)\left(R_{PIC} - \bar{R}_{PIC}\right)\right]}{N-1}$$

$$= \frac{1.4478}{6-1} = 0.29$$

Now with the help of Cov. $_{EIC, PIC}$, we can calculate optimal weight of stock EIC & PIC which minimize the risk.

$$W_{EIC} = \frac{\sigma^2_{PIC} - Cov.\left(R_{EIC}, R_{PIC}\right)}{\sigma_{EIC}^{\ 2} + \sigma_{PIC}^{\ 2} - 2Cov.\left(R_{EIC}, R_{PIC}\right)}$$

Where, $W_{EIC}$ = Optimal weight to invest on EIC stock.

$$= \frac{0.2025 - 0.29}{0.6028 + 0.2025 - 2 \times 0.29}$$

$$= \frac{-0.0875}{0.8053 - 0.58}$$

$W_{EIC} = -0.3884$

$W_{PIC} = 1 - W_{EIC}$

Where, $W_{PIC}$ = Optimal weight to invest in stock of PIC.

$= 1-(-0.3884)$

$\therefore W_{PIC} = 1.3884$

Since the optimal weight of stock of EIC is –0.3884 and stock of PIC is 1.3884 when holding portfolio of EIC and PIC. $W_{PIC}$ is greater than 1, so $W_{EIC}$ is negative.

## Calculation of portfolio return and risk of EIC and PIC.

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

Portfolio Return of EIC & PIC stock

$$\bar{R}p = W_{EIC} \times \bar{R}EIC + W_{PIC} \times \bar{R}PIC$$

$= -0.3884 \times 0.3093 + 1.3884 \times 0.2031$

$= -0.12 + 0.282$

= 0.162 or 16.2%Portfolio

Where,

$\bar{R}_P$ = Expected return on portfolio of stock of EIC & PIC

$\bar{R}_{EIC}$ = Expected return of Everest Insurance Company

$\bar{R}_{PIC}$ = Expected return of Premier Insurance Company

$W_{EIC}$ = Optimal weight of EIC.

$W_{PIC}$ = Optimal Weight of PIC.

Portfolio Risk

Portfolio risk is the risk of individual security plus covariance between securities.

$$\sigma_P = \sqrt{W_{EIC}{}^2 \sigma_{EIC}{}^2 + W_{PIC}{}^2 \sigma_{PIC}{}^2 + 2 W_{EIC} W_{PIC} Cov._{EIC,PIC}}$$

$$= \sqrt{(-0.3884)^2 \times 0.6028 + (1.3884)^2 \times 0.2025 + 2 \times (-0.3884) \times (1.3884) \times 0.29}$$

$$= \sqrt{0.0909 + 0.3904 - 0.3128}$$

$$= \sqrt{0.1685} \qquad = 0.4105 \text{ or } 41.05\%$$

Now, correlation between stocks of EIC & PIC.

$$\text{Correlation}_{EIC\&PIC} = \frac{Cov.(R_{EIC}, R_{PIC})}{\sigma_{EIC} . \sigma_{PIC}}$$

$$= \frac{0.29}{0.7764 \times 0.45}$$

$$= \frac{0.29}{0.349}$$

$$= 0.831$$

Table: 4.15 Calculation of covariance and correlation, portfolio return, portfolio risk between the stock of EIC & HGIC

| **FY** | **($R_{EIC}$- $\bar{R}_{EIC}$)** | **($R_{HGIC}$- $\bar{R}_{HGIC}$)** | **($R_{EIC}$- $\bar{R}_{EIC}$) ($R_{HGIC}$- $\bar{R}_{HGIC}$)** |
|---|---|---|---|
| 2060 | –0.2807 | 0.0674 | –0.0189 |
| 2062 | 1.4848 | 1.2414 | 1.8432 |
| 2063 | –0.2983 | –0.1676 | 0.050 |
| 2064 | 0.1225 | –0.434 | –0.0532 |
| 2064 | –0.2929 | –0.3697 | 0.1083 |
| 2065 | –0.7353 | –0.3375 | 0.2482 |
| Total | | | 2.1776 |

[Data source table no. 4.4 & 4.6]

We have,

$$\text{Cov. } (R_{EIC}, - R_{HGIC}) = \frac{\sum\left[\left(R_{EIC} - \bar{R}_{EIC}\right)\left(R_{PIC} - \bar{R}PIC\right)\right]}{N-1}$$

$$= \frac{2.1776}{6-1} = 0.4355$$

$$\text{Correlation } (r_{EIC,\ HGIC}) = \frac{Cov_{EIC,\ HGIC}}{\sigma_{EIC}.\sigma_{HGIC}}$$

$$= \frac{0.4355}{0.7764 \times 0.6345}$$

$$= \frac{0.4355}{0.4926} = 0.88$$

Optimal portfolio weight of stock EIC & LHGIC.

$$W_{EIC} = \frac{\sigma^2 HGIC - Cov.\left(R_{EIC,} R_{HGIC}\right)}{\sigma_{EIC}{}^2 + \sigma_{HGIC}{}^2 - 2Cov.\left(R_{EIC}, R_{HGIC}\right)}$$

$$= \frac{0.6345 - 0.4355}{0.7764^2 + 0.6345^2 - 2 \times 0.4355}$$

$$= \frac{-0.0329}{1.0054 - 0.871}$$

$W_{EIC} = -0.2448$

$W_{PIC} = 1 - W_{EIC}$

Where, $W_{HGIC}$ = Optimal weight to invest in stock of HGIC.

$= 1-(-0.2448)$

$\therefore W_{HGIC} = 1.245$

Portfolio Return of EIC & HGIC stock

$$\bar{R}P = W_{EIC} \times \bar{R}EIC + W_{HGIC} \times \bar{R}HGIC$$

$= -0.2448 \times 0.3093 + 1.245 \times 0.2586$

$= -0.0757 + 0.322$

$= 0.246$ or 24.6%

Portfolio Risk

Portfolio risk is the risk of individual security plus covariance between securities.

$$\sigma_P = \sqrt{W_{EIC}{}^2 \sigma_{EIC}{}^2 + W_{HGIC}{}^2 \sigma_{HGIC}{}^2 + 2W_{EIC} W_{HGIC} Cov._{EIC,HGIC}}$$

$$= \sqrt{(-0.2448)^2 \times 0.6028 + 1.55 \times 0.4025 + 2 \times (-0.2448) \times (1.245) \times 0.4355}$$

$$= \sqrt{0.0361 + 0.6239 - 0.2655}$$

$$= \sqrt{0.3945}$$

$= 0.628$ or 62.8%

Table: 4.16 Calculations of Covariance, Correlation, Portfolio Return, Portfolio Risk between the Stock of EIC and UIC

| **FY** | **($R_{EIC}$- $\bar{R}_{EIC}$)** | **($R_{UIC}$- $\bar{R}_{UIC}$)** | **($R_{EIC}$- $\bar{R}_{EIC}$) ($R_{UIC}$- $\bar{R}_{UIC}$)** |
|---|---|---|---|
| 2060 | –0.2807 | 0.2288 | -0.0642 |
| 2061 | 1.4848 | 0.8803 | 1.3071 |
| 2062 | –0.2983 | -0.1643 | 0.0496 |
| 2063 | 0.1225 | -0.2285 | -0.0280 |
| 2064 | –0.2929 | -0.3487 | 0.1021 |
| 2065 | –0.7353 | -0.3667 | 0.2696 |
| | | | 1.6356 |

[Data source table no. 4.4 & 4.8]

We have,

$$\text{Cov. } (R_{EIC}, - R_{UIC}) = \frac{\sum\left[\left(R_{EIC} - \bar{R}_{EIC}\right)\left(R_{UIC} - \bar{R}_{UIC}\right)\right]}{N-1}$$

$$= \frac{1.6356}{6-1} = 0.3271$$

$$\text{Correlation } (r_{EIC,\ UIC}) = \frac{Cov_{EIC,\ UIC}}{\sigma_{EIC}.\sigma_{UIC}}$$

$$= \frac{0.3271}{0.7764 \times 0.4822}$$

$$= \frac{0.3271}{0.3744} = 0.87$$

Optimal portfolio weight of EIC & UIC stock

$$W_{EIC} = \frac{\sigma^2 UIC - Cov.\left(R_{EIC,} R_{UIC}\right)}{\sigma_{EIC}{}^2 + \sigma_{UIC}{}^2 - 2Cov.\left(R_{EIC}, R_{UIC}\right)}$$

Where, $W_{EIC}$ = Optimal weight to invest on UIC stock

$$= \frac{0.2325 - 0.3271}{0.6028 + 0.2325 - 2 \times 0.3271}$$

$= \frac{-0.0946}{0.1811} = -0.5223$

$W_{EIC} = -0.5223$

$W_{UIC} = 1 - W_{EIC}$

Where, $W_{UIC}$ = Optimal weight to invest in stock of HGIC.

$= 1-(-0.5233)$

$\therefore W_{UIC} = 1.5233$

Portfolio Return of EIC & UIC stock

$$\overline{R}_P = W_{EIC} \times \overline{R}_{EIC} + W_{UIC} \times \overline{R}_{UIC}$$

$= -0.5233 \times 0.3093 + 1.5233 \times 0.1276$

$= -0.1619 + 0.1944$

$= 0.03247$ or 3.25%

Portfolio Risk of EIC and UIC

$$\sigma_P = \sqrt{W_{EIC}{}^2 \sigma_{EIC}{}^2 + W_{UIC}{}^2 \sigma_{UIC}{}^2 + 2 W_{EIC} W_{UIC} Cov._{EIC,UIC}}$$

$$= \sqrt{-0.2738 \times 0.6028 + 2.3204 \times 0.2325 + 2 \times (-0.5233) \times 1.5233 \times 0.3271}$$

$$= \sqrt{0.1650 + 0.5395 - 0.5215}$$

$$= \sqrt{0.183}$$

$= 0.4278$ or 42.78%

Table: 4.17 Calculations of Covariance, Correlation, Portfolio Return, Portfolio Risk between the Stock of EIC and NLGIC

| **FY** | **($R_{EIC}$- $\bar{R}_{EIC}$)** | **($R_{NLGIC}$ - $\bar{R}_{NLGIC}$)** | **($R_{EIC}$- $\bar{R}_{EIC}$) ($R_{NLGIC}$- $\bar{R}_{NLGICIC}$)** |
|---|---|---|---|
| 2060 | –0.2807 | 0.2882 | -0.0809 |
| 2061 | 1.4848 | 0.4567 | 0.6781 |
| 2062 | –0.2983 | 0.0316 | -0.0094 |
| 2063 | 0.1225 | -0.2729 | -0.0334 |
| 2064 | –0.2929 | -0.0344 | 0.010 |
| 2065 | –0.7353 | -0.4692 | 0.345 |
| Total | | | 0.90946 |

[Data source table no. 4.4 & 4.10]

We have,

$$\text{Cov. } (R_{EIC}, - R_{NLGIC}) = \frac{\sum\left[\left(R_{EIC} - \bar{R}_{EIC}\right)\left(R_{NLGIC} - \bar{R}_{NLGIC}\right)\right]}{N-1}$$

$$= \frac{0.90946}{6-1} = 0.1819$$

$$\text{Correlation } (r_{EIC,\ NLGIC}) = \frac{Cov_{EIC,\ NLGIC}}{\sigma_{EIC}.\sigma_{NLGIC}}$$

$$= \frac{0.1819}{0.7764 \times 0.3430}$$

= 06830

Optimal portfolio weight of stock EIC & NLGIC

$$W_{EIC} = \frac{\sigma^2 NLGIC - Cov.\left(R_{EIC,} R_{NLGIC}\right)}{\sigma_{EIC}{}^2 + \sigma_{NLGIC}{}^2 - 2Cov.\left(R_{EIC}, R_{NLGIC}\right)}$$

Where, $W_{EIC}$ = Optimal weight to invest on NLGIC stock

$$= \frac{0.1176 - 0.1819}{0.6028 + 0.1176 - 2 \times 0.1819}$$

$= \frac{-0.0643}{0.3566}$ = -0.1803

$W_{EIC}$ = –0.1803

$W_{NLGIC}$ = 1– $W_{EIC}$

Where, $W_{NLGIC}$ = Optimal weight to invest in stock of NLGIC.

= 1–(–0.1803)

∴ $W_{NLGIC}$ = 1.1803

Portfolio Return of EIC & NLGIC stock

$$\overline{R}_P = W_{EIC} \times \overline{R}_{EIC} + W_{NLGIC} \times \overline{R}_{NLGIC}$$

= –0.1803×0.3093+1.1803×0.0562

= –0.0558 + 0.0663

= 0.0105 or 1.05%

Portfolio Risk of EIC and NLGIC

$\sigma_P$ =

$$\sqrt{W_{EIC}{}^2 \sigma_{EIC}{}^2 + W_{NLGIC}{}^2 \sigma_{NLGIC}{}^2 + 2W_{EIC} W_{NLGIC} Cov._{EIC,NLGIC}}$$

$= \sqrt{0.0325 \times 0.6028 + 1.3932 \times 0.1176 - 0.0656}$

$= \sqrt{0.0196 + 0.1638 - 0.0656}$

$= \sqrt{0.1178}$

= 0.3432 or 34.32%

### 4.6.1 Composition of Risk and Return on the basis of isolation and portfolio of EIC and PIC

**Table: 4.18 Portfolio Risk and Return of EIC and PIC**

| Company | In Isolation | | | In Portfolio | | | | |
|---|---|---|---|---|---|---|---|---|
| | Return | S.D. | C.V. | Return | S.D. | C.V. | Cov. | Corr. |
| EIC | 0.3093 | 0.7764 | 2.5102 | | | | | |
| | | | | 0.162 | 0.4105 | 2.534 | 0.29 | 0.831 |
| PIC | 0.2031 | 0.450 | 2.2157 | | | | | |

The above table shows the risk and return of EIC and PIC. This calculation shows that total risk of EIC and PIC are 0.7764 and 0.45 respectively in isolation. And also total risk or S.D. of both companies' in portfolio is only 0.4105 and the portfolio return of EIC and PIC is 0.162. For a portfolio to be selected its return must be greater than be combined return of individual stock.

### 4.6.2 Comparison of Risk and Return on the Basis of Isolation and Portfolio of EIC and HGIC

**Table: 4.19 Portfolio Risk and Return of EIC and HGIC**

| Company | In Isolation | | | In Portfolio | | | | |
|---|---|---|---|---|---|---|---|---|
| | Return | S.D. | C.V. | Return | S.D. | C.V. | Cov. | Corr. |
| **EIC** | **0.3093** | **0.7764** | **2.5102** | | | | | |
| | | | | **0.246** | **0.628** | **2.553** | **0.4355** | **0.88** |
| **HGIC** | **0.2586** | **0.6345** | **2.4535** | | | | | |

From above calculation we can clearly see that portfolio return is 0.246. Similarly portfolio risk is 0.628. By holding investment of EIC and HGIC investor can get more return than HGIC's return in isolation and risk of both companies is greater in isolation than portfolio. For a portfolio to be selected its return must be greater than

the combined return of individual stock of EIC and HGIC. So, this set of EIC and HGIC's portfolio is not beneficial for investment.

4.6.3 Comparison of Risk and Return on the basis of isolation and portfolio of EIC and UIC

**Table:4.20 Portfolio Risk and Return of EIC and UIC**

| Company | In Isolation | | | In Portfolio | | | | |
|---|---|---|---|---|---|---|---|---|
| | Return | S.D. | C.V. | Return | S.D. | C.V. | Cov. | Corr. |
| EIC | 03093 | 0.7764 | 2.5102 | | | | | |
| | | | | 0.0325 | 0.4278 | 13.16 | 0.327 | 0.87 |
| UIC | 0.1276 | 0.4822 | 3.779 | | | | | |

From above table shows that portfolio return of EIC and UIC is 0.0325 and portfolio risk is 0.4278. For a portfolio to be selected its return must be greater than the combined return. In this case the portfolio of EIC and UIC is not acceptable. Because return is less in portfolio than isolation. So it is not beneficial for investment.

**4.6.4 Comparison of Risk and Return on the basis of Isolation and Portfolio of EIC and NLGIC**

**Table: 4.21 Portfolio Risk and Return of EIC and NLGIC**

| Company | In Isolation | | | In Portfolio | | | | |
|---|---|---|---|---|---|---|---|---|
| | Return | S.D. | C.V. | Return | S.D. | C.V. | Cov. | Corr. |
| EIC | 0.3093 | 0.7764 | 2.5102 | | | | | |
| | | | | 0.0105 | 0.3432 | 32.69 | 0.1819 | 0.68300 |
| NLGIC | 0.0512 | 0.3430 | 6.12 | | | | | |

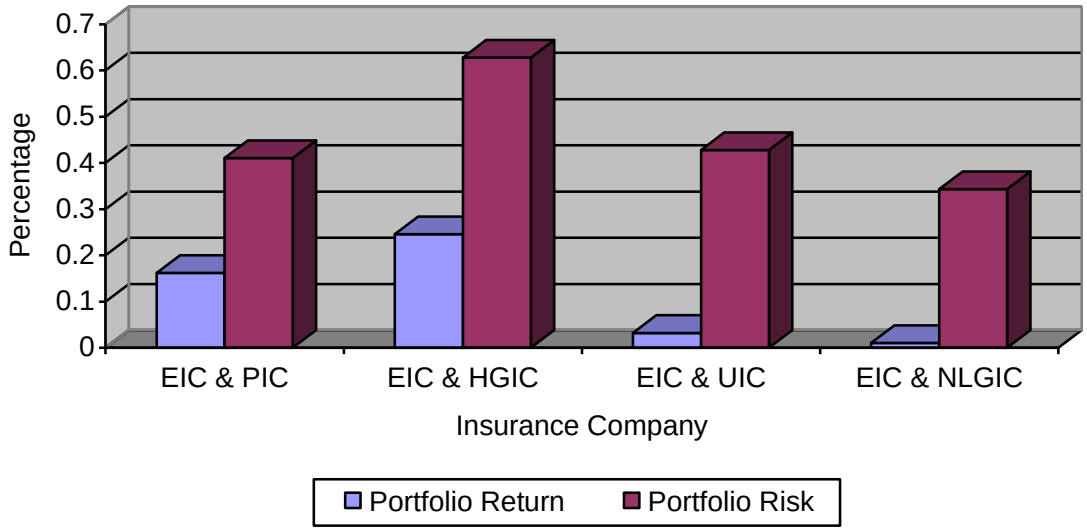
The above table shows that the risk and return of EIC and NLGIC. By holding investments of EIC and NLGC investment can get more return than NLGIC's return in isolation and risk of both companies' is greater than isolation. For a portfolio to be selected its return must be greater than the combined portfolio return. So this set of EIC and NLGIC's portfolio is not beneficial for investment.

**Table: 4.22 Comparative Analysis of Portfolio Risk and Return**

| Portfolios | Portfolio Return | Portfolio Risk | C.V. | Covariance | Remarks |
|---|---|---|---|---|---|
| EIC & PIC | 0.162 | 0.4105 | 2.534 | 0.29 | Lowest S.D. |
| EIC & HGIC | 0.246 | 0.628 | 2.553 | 0.4355 | Highest Return |
| EIC & UIC | 0.0325 | 0.4278 | 13.16 | 0.327 | |
| EIC & NLGIC | 0.0105 | 0.3432 | 32.69 | 0.1819 | |

Above table shows that portfolio return, portfolio risk and covariance between selected insurance company's portfolio of EIC and HGIC has highest return 0.246 portfolio of EIC and PIC has lowest S.D. and lowest C.V. Investor can earn highest return by holding optimal portfolio of EIC and HGIC. Investor has to bear lowest risk by holding optimal portfolio of EIC and PIC.

Figure: 4.16 Portfolio Risk and Return




Generally, it is said that, securities return of same sector moves in same direction. So correlation between securities of same sector is

positive. Correlation between two securities also can help to identify the risk. If correlation between two securities is perfectively negative, i.e. –1, then proper combination of two securities can reduce unsystematic risk and can even be eliminated if proper diversification is so. If correlation is perfectly positive, i.e. +1, then portfolio cannot reduce any level of risk.

Correlation between Common Stock of Sample Insurance Companies are Shown below.

**Table: 4.23 Correlation**

| | EIC | PIC | HGIC | UIC | NLGIC |
|---|---|---|---|---|---|
| EIC | 1 | 0.831 | 0.88 | 0.87 | 0.6830 |

Above table 4.37 shows that the correlation between sample insurance company stock. Investor can not obtain gain by constructing portfolio, which has positive correlation.

Correlation between EIC and HGIC is highly positive i.e. 0.88. Here correlation between EIC and PIC, EIC and HGIC, EIC and UIC, EIC and NLGIC all are positively correlated. Therefore, portfolio cannot reduce any level of risk. Because the correlation coefficient between EIC and other stocks are more than 0.68. (high degree of positive correlation)

## 4.7 Analysis of Market Sensitivity

Market sensitivity of stock is the systematic risk that is measured by its beta coefficient. Beta coefficient is an index of systematic risk that can not be reduced by diversification. Beta coefficient shows how sensitive the stock in comparison with market. Greater beta means

higher risk and return. It measures the responsiveness of a security movement in market portfolio.

Depending upon the volatile of stock return relative to market return for an individual stock, beta could be less than, more than or equal to 1.

To calculate beta of stock, first we have to calculate the covariance between on that stock and market return. Then we can calculate the beta coefficient by using.

$$Bj = \frac{Cov(r_j r_m)}{\sigma^2 m}$$

Beta Coefficient of Stock of PIC

**Table: 4.24 Covariance between Stock of PIC and Market**

| FY | $(R_{PIC} - \bar{R}_{PIC})$ | $(R_m - \bar{R}_m)$ | $(R_{PIC} - \bar{R}_{PIC})(R_m - \bar{R}_m)$ |
|---|---|---|---|
| 2060 | -0.0965 | 0.2289 | -0.0221 |
| 2061 | 0.877 | 0.5638 | 0.4945 |
| 2062 | -0.2711 | -0.133 | 0.0361 |
| 2063 | -0.3851 | -0.446 | 0.1718 |
| 2064 | -0.0151 | -0.1987 | 0.0030 |
| 2065 | -0.1093 | -0.0151 | 0.0017 |
| Total | | | 0.6848 |

[Data source table no. 4.2 and 4.13]

We have,

$$\text{Cov. (PIC, m)} = \frac{\sum\left[\left(R_{PIC} - \bar{R}_{PIC}\right)\left(R_m - \bar{R}_m\right)\right]}{N-1}$$

$$= \frac{0.6848}{6-1} = 0.1370$$

Beta coefficient of common stock of PIC ($\beta_{PIC}$)

$$\beta_{PIC} = \frac{Cov(R_{PIC}, Rm)}{\sigma^2 m}$$

Where, $\sigma^2 m$ = Variance of market Return

$$= \frac{0.1370}{(0.354)^2} = \frac{0.1370}{0.1253} = 1.0934$$

Beta of PIC is 1.0934

**Table: 4.25 Variance between Stock of EIC and Market**

| FY | $(R_{EIC} - \bar{R}_{EIC})$ | $(R_m - \bar{R}_m)$ | $(R_{EIC} - \bar{R}_{EIC})(R_m - \bar{R}_m)$ |
|---|---|---|---|
| 2060 | –0.2807 | 0.2289 | –0.0643 |
| 2061 | 1.4848 | 0.5638 | 0.8371 |
| 2062 | –0.2983 | –0.133 | 0.0397 |
| 2063 | 0.1225 | –0.446 | –0.0546 |
| 2064 | –0.2929 | –0.1987 | 0.0582 |
| 2065 | –0.7353 | –0.0151 | 0.0111 |
| Total | | | 0.8272 |

[Data source table no. 4.4 & 4.13]

We have,

$$\text{Cov. (EIC, m)} = \frac{\sum\left[\left(R_{EIC} - \bar{R}_{EIC}\right)\left(R_m - \bar{R}m\right)\right]}{N-1}$$

$$= \frac{0.8272}{6-1} = 0.1654$$

Beta coefficient of common stock of EIC ($\beta_{EIC}$)

$$\beta_{EIC} = \frac{Cov(R_{EIC}, Rm)}{\sigma^2 m}$$

Where, $\sigma^2 m$ = Variance of market Return

$$= \frac{0.1654}{0.1253} = 1.3203$$

Beta of EIC is 1.3203

**Table: 4.26 Variance between Stock of HGIC and Market**

| FY | $(R_{HGIC}-\bar{R}_{HGIC})$ | $(R_m-\bar{R}_m)$ | $(R_{HGIC}-\bar{R}_{HGIC})(R_m-\bar{R}_m)$ |
|---|---|---|---|
| 2060 | 0.0674 | 0.2289 | 0.0154 |
| 2061 | 1.2414 | 0.5638 | 0.6999 |
| 2062 | –0.1676 | –0.133 | 0.0223 |
| 2063 | –0.434 | –0.446 | 0.1936 |
| 2064 | –0.3697 | –0.1987 | 0.0735 |
| 2065 | –0.3375 | –0.0151 | 0.0051 |
| Total | | | 1.0097 |

[Data source table no. 4.6 & 4.13]

We have,

$$\text{Cov. (HGIC, m)} = \frac{\sum\left[\left(R_{HGIC}-\bar{R}_{HGIC}\right)\left(R_m-\bar{R}_m\right)\right]}{N-1}$$

$$= \frac{1.0097}{6-1} = 0.2019$$

Beta coefficient of common stock of HGIC ($\beta_{HGIC}$)

$$\beta_{HGIC} = \frac{Cov(R_{HGIC}, Rm)}{\sigma^2 m}$$

Where, $\sigma^2 m$ = Variance of market Return

$$= \frac{0.2019}{0.1253} = 1.6117$$

Beta of HGIC is 1.6117

**Table: 4.27 Covariance between Stock of UIC and Market**

| FY | $(R_{UIC}-\bar{R}_{UIC})$ | $(R_m-\bar{R}_m)$ | $(R_{UIC}-\bar{R}_{UIC})(R_m-\bar{R}_m)$ |
|---|---|---|---|
| 2060 | 0.2288 | 0.2289 | 0.0524 |
| 2061 | 0.8803 | 0.5638 | 0.4963 |
| 2062 | –0.1643 | –0.133 | 0.0219 |
| 2063 | –0.2285 | –0.446 | 0.1019 |
| 2064 | –0.3487 | –0.1987 | 0.0693 |

| | | | |
|---|---|---|---|
| 2065 | –3667 | –0.0151 | 0.0055 |
| Total | | | 0.7473 |

[Data source table no. 4.8 & 4.13]

We have,

$$\text{Cov. (UIC, m)} = \frac{\sum\left[\left(R_{UIC} - \bar{R}_{UIC}\right)\left(R_m - \bar{R}_m\right)\right]}{N-1}$$

$$= \frac{0.7473}{6-1} = 0.1495$$

Beta coefficient of common stock of PIC ($\beta_{UIC}$)

$$\beta_{UIC} = \frac{Cov(R_{UIC}, Rm)}{\sigma^2 m}$$

Where, $\sigma^2 m$ = Variance of market Return

$$= \frac{0.1495}{0.1253} = 1.1931$$

Beta of UIC is 1.1931

**Table: 4.28 Covariance between Stock of NLGIC and Market**

| FY | $(R_{NLGIC} - \bar{R}_{NLGIC})$ | $(R_m - \bar{R}_m)$ | $(R_{NLGIC} - \bar{R}_{NLGIC})(R_m - \bar{R}_m)$ |
|---|---|---|---|
| 2060 | 0.2882 | 0.2289 | 0.0660 |
| 2061 | 0.4567 | 0.5638 | 0.2575 |
| 2062 | 0.0316 | –0.133 | –0.0042 |
| 2063 | –0.0316 | –0.446 | 0.1217 |
| 2064 | –0.0344 | –0.1987 | 0.0068 |
| 2065 | 0.4692 | –0.0151 | –0.0071 |
| Total | | | 0.4407 |

[Data source table no.4.10 &4.13]

We have,

$$\text{Cov. (NLGIC, m)} = \frac{\sum\left[\left(R_{NLGIC} - \bar{R}_{NLGIC}\right)\left(R_m - \bar{R}_m\right)\right]}{N-1}$$

$$= \frac{0.4407}{6-1} = 0.0881$$

Beta coefficient of common stock of NLGIC ($\beta_{NLGIC}$)

$$\beta_{NLGIC} = \frac{Cov(R_{NLGIC}, Rm)}{\sigma^2 m}$$

Where, $\sigma^2 m$ = Variance of market Return

$$= \frac{0.0881}{0.1253} = 0.7031$$

Beta of NLGIC is 0.7031

**Calculated Beta coefficient of selected sample insurance companies is shows in below.**

**Table: 4.29 Beta coefficient of Sample Insurance Company**

| S.N. | Name of Company | Beta Coefficient |
|---|---|---|
| 1 | PIC | 1.0934 |
| 2 | EIC | 1.3203 |
| 3 | HGIC | 1.6117 |
| 4 | UIC | 1.1931 |
| 5 | NLGIC | 0.7031 |

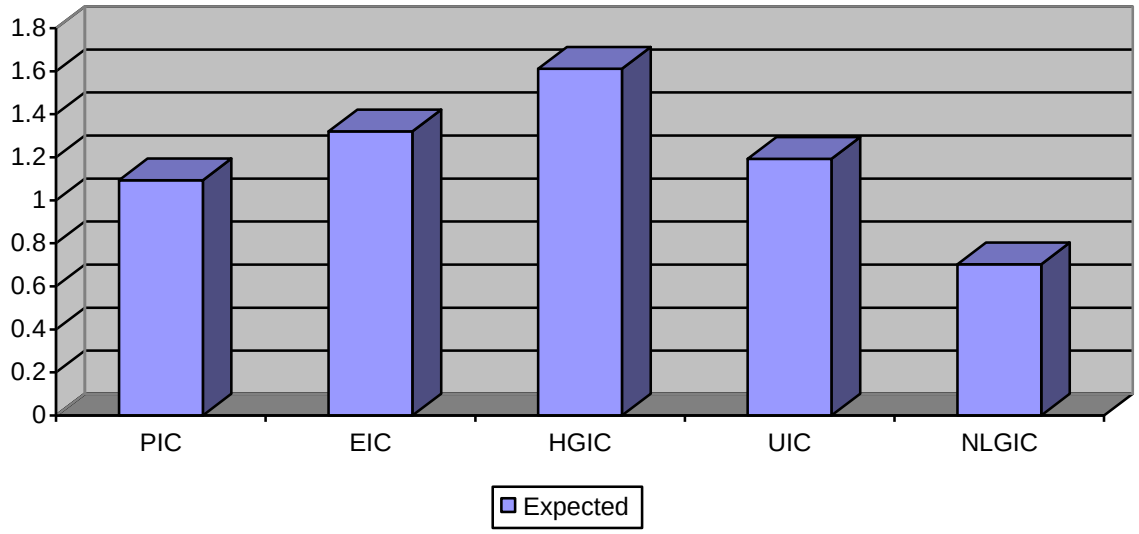
From above calculation shows that beta coefficient of Premier Insurance Company (PIC) is 1.0934 which is greater than 1. It indicates that stock return of PIC is more volatile than market return. So company is highly sensitive that with 1% increase in market return there will be 1.0934% risk in the stocks return. Beta of EIC is 1.3203, which indicates that stock's return of EIC is more volatile than market return. It means 1% change in market return will cause that 1.3203% change in EIC stock's return.

Beta of HGIC and UIC is also 1.6117 and 1.1931 respectively. Which is indicates that stock's returns of both companies are more volatile than market return. 1% change in market return will cause that 1.6117% and 1.1931% change in both companies (HGIC, PIC) stock's return.

But beta of NLGIC is 0.7031, which is less than 1. It indicates that stock's return of NLGIC is less volatile than market return. 1% changes in market return brought only 0.7031% change in NLGIC stock's return.

Beta coefficient from above calculation is greater than 1 except of NLGIC. Therefore, the stock of PIC, EIC, HGIC and UIC are aggressive stock where as the stock of NLGIC is defensive stock.

**Figure: 4.17 Beta Coefficient of Sample Insurance Company**




Above figure shows that beta of all observed insurance company's are positive. It means return of stock of these companies is moves to same direction where the market return moves. Only NLGIC's beta is less volatile than market. Beta coefficient of HGIC is highest among observed companies and lowest beta coefficient is NLGIC. From above result we can say that if market return raises all sample company's return rise and vice versa.

## 4.8 Price Evaluation of Common Stock of Sample Insurance Companies

Beta is one of the most important factors of CAPM. According to CAPM assumption stock's required rate of return is equal to the risk free rate and plus its risk premium. Where risk is measured by the beta

coefficient. To evaluation of price of common stock the following two assumptions can be used.

- If required rate of return (RRR) is less than expected rate of return (ERR) the stock is under priced.
- If required rate of return (RRR) is more than average expected rate of return (ERR) the stock in overpriced.

**Table: 4.30 RRR, ERR and Price Valuation**

| S.N. | Insurance Company | $R_F$% | Beta ($\beta$) | $\overline{R}_m$(%) | ERR (%) | RRR (%) | Price Valuation |
|---|---|---|---|---|---|---|---|
| **1** | **PIC** | **3.64** | **1.0934** | **9.90** | **20.31** | **10.48** | **Under Price** |
| **2** | **EIC** | **3.64** | **1.3203** | **9.90** | **30.93** | **11.91** | **Under Price** |
| **3** | **HGIC** | **3.64** | **1.6117** | **9.90** | **25.86** | **13.73** | **Under Price** |
| **4** | **UIC** | **3.64** | **1.1931** | **9.90** | **12.76** | **11.11** | **Under Price** |
| **5** | **NLGIC** | **3.64** | **0.7031** | **9.90** | **5.62** | **8.04** | **Over Price** |

Required Rate of Return (RRR) = $R_F+(R_m - R_F)\beta$

Where, $R_F$ = Risk Free Rate of Return, = 3.64%

$\overline{R}_m$ = Market Rate of Return, 9.9%

Source: (NRB Treasury Bill)

**The above table describes the price situation of the common stock of different samples insurance companies where they are overpriced or under priced.**

This calculation is on the basis of capital assets pricing model (CAPM). Comparison between required rate of return (RRR) and average expected rate of return (ERR) determines stock to be over priced or under priced. According to CAPM model if RRR is less than ARRR. Stock is said to be under priced and this situation investor should follow buying strategy for this type of stock. If RRR is greater than ERR, stock said to be overpriced and investor should sell that type of stock.

From above calculation we can observe that the common stock of all samples companies is under priced except NLGIC stock.

So it implies that investors can be benefited to buy the stock of PIC, EIC, HGIC, & UIC whereas they are benefited by selling of NLGIC because it is overpriced.

## 4.9 Segregation of Risk

The total risk involved in holdings a stock in to two part i.e. systematic risk and unsystematic risk. Total risk for an individual security can be measured by standard deviation or variance of rate of return.

The systematic risk i.e. caused by whole system and can't be diversified. Where as unsystematic risk i.e. due to internal factors and can be diversified. So it is known as avoidable risk.

Diversifiable risk can be diversified at no cost so investor should know that the portion of systematic risk and unsystematic risk because by partitioning risk investor knows what extent risk of particular stock can be diversified away by holding an optimal portfolio.

Calculation of systematic risk and unsystematic risk and their proportion of stock each company is as follows:

### 4.9.1 Segregation of Risk of PIC Stock

Total risk measured by variance ($\sigma^2$) has segregation into systematic and unsystematic.

Variance of PIC stock's return = Total risk of PIC

$\sigma^2_{PIC} = b^2_{PIC}\,\sigma^2_m + Var(e)$

$(0.45)^2 = (1.0934)^2 \times (0.354)^2 + Var(e)$

or, $0.2025 = 1.1955 \times 0.1253 + Var(e)$

or, $0.2025 = 0.1498 + Var(e)$

or, $0.2025 - 0.1498 = Var(e)$

$\therefore Var(e) = 0.0527$

$\therefore$ Total Risk = 0.0527

(a) Systematic Risk = 0.1498

$\therefore$ Portion of Systematic Risk on Total Risk = $\frac{\text{Systematic Risk}}{\text{Total Risk}}$

= $\frac{0.1498}{0.2025}$, = 0.7398

= 73.98%

(b) Unsystematic Risk = Var(e) = 0.0527

$\therefore$ Portion of Unsystematic Risk on Total Risk = $\frac{\text{Unsystematic Risk}}{\text{Total Risk}}$

= $\frac{0.0527}{0.2025}$, = 0.2064, = 26.02%

Hence, the total risk of PIC stock consists of 73.98% systematic risk and 26.02% unsystematic risk system.

Note: The systematic risk can also be measured by coefficient of determination i.e. $r^2$ of return of return of stock and market return.

### 4.9.2 Segregation of Risk of EIC Stock

Variance of EIC Stock = Total Risk of EIC

$\sigma^2_{EIC} = b^2_{EIC}\ \sigma^2_m + Var(e)$

$(0.7764)^2 = (1.3204)^2 \times (0.354)^2 + Var(e)$

or, $0.6028 = 1.7435 \times 0.1253 + Var(e)$

or, 0.6028 = 0.2185 + Var(e)

or, 0.6028 – 0.2185 = Var(e)

$\therefore$Var(e) = 0.3843

$\therefore$ Total Risk = 0.6028

(a) Systematic Risk = 0.2185

$\therefore$ Portion of Systematic Risk on Total Risk = $\frac{\text{Systematic Risk}}{\text{Total Risk}}$

= $\frac{0.2185}{0.6028}$, = 0.3625

= 36.25%

(b) Unsystematic Risk = Var(e) = 0.3843

$\therefore$ Portion of Unsystematic Risk on Total Risk = $\frac{\text{Unsystematic Risk}}{\text{Total Risk}}$

= $\frac{0.3843}{0.6028}$, = 0.6375, = 63.75%

Hence, the total risk of EIC stock consists of 36.25% systematic risk and 63.75% unsystematic risk system.

### 4.9.3 Segregation of Risk of HGIC Stock

Variance of HGIC Stock = Total Risk of HGIC

$\sigma^2_{HGIC} = b^2_{HGIC}\,\sigma^2_m + Var(e)$

$(0.6345)^2 = (1.6117)^2 \times (0.354)^2 + Var(e)$

or, $0.4025 = 2.5976 \times 0.1253 + Var(e)$

or, $0.4025 = 0.3255 + Var(e)$

or, $0.6028 - 0.2185 = Var(e)$

$\therefore Var(e) = 0.077$

$\therefore$ Total Risk = 0.4025

(a) Systematic Risk = 0.3255

$\therefore$ Portion of Systematic Risk on Total Risk = $\frac{\text{Systematic Risk}}{\text{Total Risk}}$

= $\frac{0.3255}{0.4025}$, = 0.8087

= 80.87%

(b) Unsystematic Risk = Var(e) = 0.077

$\therefore$ Portion of Unsystematic Risk on Total Risk = $\frac{\text{Unsystematic Risk}}{\text{Total Risk}}$

= $\frac{0.077}{0.4025}$, = 0.1913, = 19.13%

**Hence, the total risk of HGIC stock consists of 80.87% systematic risk and 19.13 % unsystematic risk system.**

### 4.9.4 Segregation of Risk of UIC Stock

Variance of UIC Stock = Total Risk of UIC

$\sigma^2_{UIC} = b^2_{UIC}\,\sigma^2_m + Var(e)$

$(0.4822)^2 = (1.1931)^2 \times (0.354)^2 + Var(e)$

or, 0.2325 = 0.1784 + Var(e)

$\therefore$Var(e) = 0.0541

$\therefore$ Total Risk = 0.2325

(a) Systematic Risk = 0.1784

$\therefore$ Portion of Systematic Risk on Total Risk = $\frac{\text{Systematic Risk}}{\text{Total Risk}}$

= $\frac{0.1784}{0.2325}$, = 0.7673

= 76.73%

(b) Unsystematic Risk = Var(e) = 0.0541

$\therefore$ Portion of Unsystematic Risk on Total Risk = $\frac{\text{Unsystematic Risk}}{\text{Total Risk}}$

= $\frac{0.0541}{0.2325}$, = 0.2327, = 23.27%

Hence, the total risk of UIC stock consists of 76.73% systematic risk and 23.27% unsystematic risk system.

### 4.9.5 Segregation of Risk of NLGIC Stock

Variance of NLGIC Stock = Total Risk of NLGIC

$\sigma^2_{NLGIC} = b^2_{NLGIC}\,\sigma^2_m + Var(e)$

$(0.3430)^2 = (0.7031)^2 \times (0.354)^2 + Var(e)$

or, $0.1176 = 0.0619 + Var(e)$

$\therefore Var(e) = 0.0557$

$\therefore$ Total Risk = 0.1176

(a) Systematic Risk = 0.0619

$\therefore$ Portion of Systematic Risk on Total Risk = $\frac{\text{Systematic Risk}}{\text{Total Risk}}$

$= \frac{0.0619}{0.1176}$, = 0.5264 = 52.64%

(b) Unsystematic Risk = Var(e) = 0.0557

$\therefore$ Portion of Unsystematic Risk on Total Risk = $\frac{\text{Unsystematic Risk}}{\text{Total Risk}}$

$= \frac{0.0557}{0.1176}$, = 0.4736, = 47.36%

**Hence, the total risk of NLGIC stock consists of 52.64% systematic risk and 47.36% unsystematic risk system.**

Table: 4.31 Summary of Segregation of Total Risk of Sample Stocks

| S.N. | Insurance Company | Total Risk $(\sigma)^2$ | Systematic Risk | Proportion | Unsystematic Risk | Proportion |
|---|---|---|---|---|---|---|
| **1** | **PIC** | **0.2025** | **0.1498** | **0.7398** | **0.0527** | **0.2602** |
| **2** | **EIC** | **0.6028** | **0.2185** | **0.3625** | **0.3843** | **0.6375** |
| **3** | **HGIC** | **0.4025** | **0.3255** | **0.8087** | **0.077** | **0.1913** |
| **4** | **UIC** | **0.2325** | **0.1784** | **0.7673** | **0.0541** | **0.2327** |
| **5** | **NLGIC** | **0.1176** | **0.0619** | **0.5264** | **0.0557** | **0.4736** |

**Proportion of systematic risk and unsystematic risk are shown in above table and also shows in diagram below:**

Figure: 4.17.1 Proportion of Risk of PIC Stock



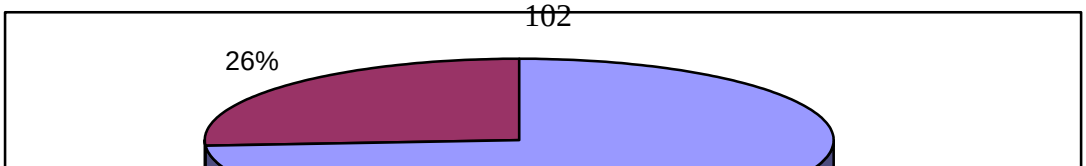


Figure: 4.17.2 Proportion of Risk of EIC Stock

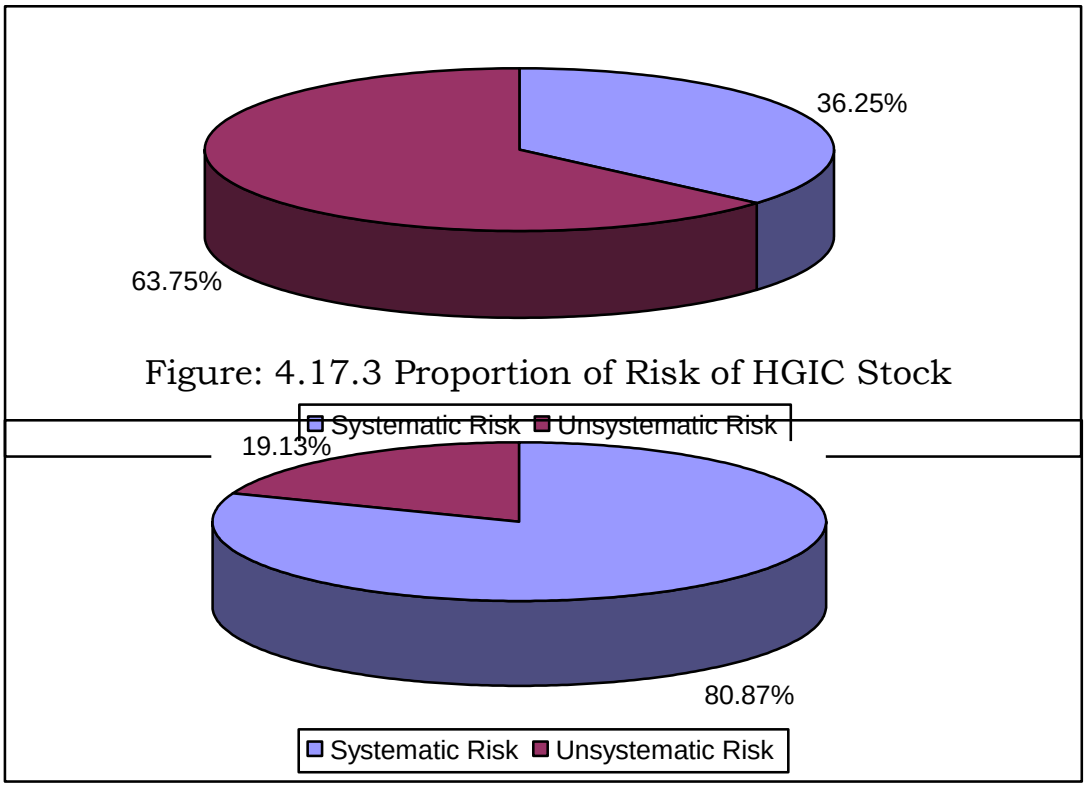



Figure: 4.17.3 Proportion of Risk of HGIC Stock




Figure: 4.17.4 Proportion of Risk of UIC Stock

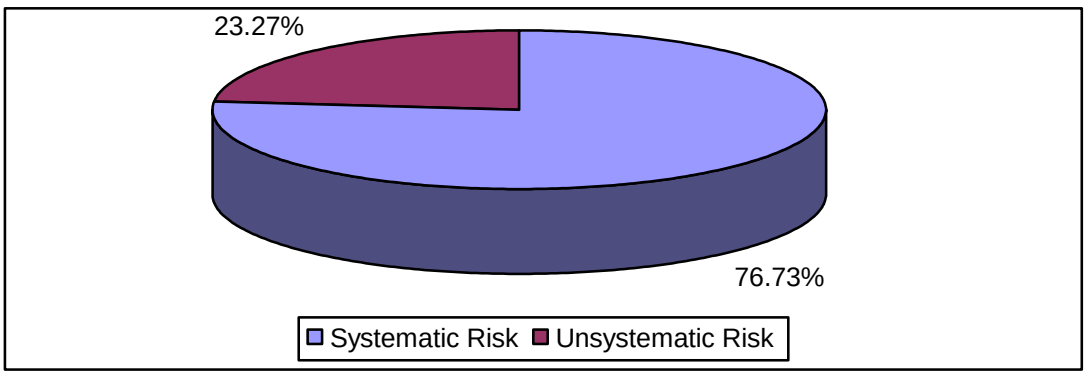
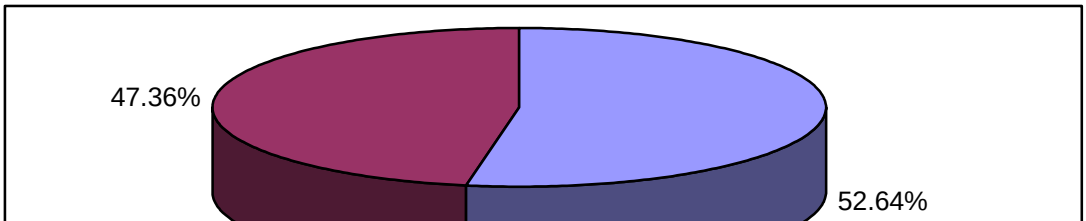



Figure: 4.17.5 Proportion of Risk of NLGIC Stock



**The summary of segregation of total risk into systematic and unsystematic risk as presented in table 4.26 reveals that HGIC stock has highest portion of systematic (non diversifiable) risk that is 80.87% among all sample stocks where as the EIC stock has the lowest portion of systematic risk i.e. 36.25%. This evidence indicates that while constructing a portfolio to minimize the risk EIC stock is preferable because the investors can minimize the portion of risk.**

## 4.10 Constructing the Optimal Portfolio (Single Index Model)

**To develop the optimal portfolio consisting of stock of sample insurance companies, Sharpe's single index model can be used. Here, as suggested by Elton et.al. (1978) and Bhalla (2001) an optimal portfolio has been constructed. The desirability of any security is directly related to its excess return over ratio (Bhalla, 2005, 611). The number of securities selected for portfolio depends on the unique cut-off rate.**

Table: 4.32 Data Needed to Find Optimal Portfolio

T = 3.64%

| Security | Mean return ($\overline{R_i}$) | Excess return ($\overline{R}_i - T$) | Beta ($\beta_{im}$) | Unsystematic risk ($\sigma^2_{ei}$) | Excess return over beta ($\overline{R}_i - T$)/ $\beta_{im}$ |
|---|---|---|---|---|---|
| **EIC** | **30.93** | **27.29** | **1.32** | **38.43** | **20.67** |
| **PIC** | **20.31** | **16.67** | **1.09** | **5.27** | **15.25** |
| **HGIC** | **25.86** | **22.22** | **1.61** | **7.70** | **13.79** |
| **UIC** | **12.76** | **9.12** | **1.19** | **5.41** | **7.64** |
| **NLGIC** | **5.62** | **1.98** | **0.70** | **5.57** | **2.82** |

**(Data source table no. 4.11, 4.29 & 4.31)**

Table 4.32 above are represents the mean return, excess return, beta and unsystematic or unique risk; and the ratio of excess return over beta. The five securities are ranked based on excess return over beta ratio from highest to lowest.

All the securities whose excess return to risk ratio are above the cut-off rate are accepted and below are rejected. For the moment, assume that C* = 13.124 examining the 4.36 shows that for securities 1 to 3,

$(\bar{R}i - T)/\beta_{im}$ is greater than C* while for security 4 and 5, it has $(\bar{R}i - T)/\beta_{im}$ is lower than C. Hence, the optimal portfolio consists of security 1 to 3.

For the portfolio of i security Ci is given by.

$$Ci = \frac{\sigma^2 m \sum_{i=1}^{i} \frac{(\bar{R}i - T)\beta_{im}}{\sigma^2 ei}}{1 + \sigma^2 m \sum_{i=1}^{i} \frac{\beta^2 im}{\sigma^2 ei}}$$

Where, $\sigma^2_m$ =12.532

And, to compute the proportion of investment in each stock consists in portfolio, $Z_i$ is given by:

$$Z_i = \frac{\beta_{im}}{\sigma^2 ei}\left[\frac{(\bar{R}i - T)}{\beta_{im}} - C^*\right]$$

Where, C* = 13.124

**Table: 4.33 Calculation for Determining Cut-off rate with $\sigma^2_m$ = 12.532**

| S. N. | Security | $(\bar{R} - T)/\beta_{im}$ | $\frac{(\bar{R} - T)/\beta_{im}}{\sigma^2_{ei}}$ | $\frac{\beta^2_{im}}{\sigma^2_{ei}}$ | $\frac{(\bar{R} - T)\beta_{im}}{\sigma^2_{ei}}$ | $\sum_{i=1}^{i} \frac{(\bar{R} - T)\beta_{im}}{\sigma^2_{ei}}$ | $\sum_{i=1}^{i} \frac{\beta^2_{im}}{\sigma^2_{ei}}$ | $C_i$ | Z | Z Proportion |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | EIC | 20.670 | 0.538 | 0.045 | 0.938 | 0.938 | 0.045 | 7.491 | 0.259 | 30.93% |
| 2 | PIC | 15.246 | 2.893 | 0.227 | 3.459 | 4.396 | 0.272 | 12.489 | 0.440 | 52.52% |
| 3 | HGIC | 13.787 | 1.790 | 0.337 | 4.651 | 9.047 | 0.610 | 13.124 | 0.139 | 16.55% |
| 4 | UIC | 7.644 | 1.413 | 0.263 | 2.011 | 11.058 | 0.873 | 11.610 | - | - |
| 5 | NLGIC | 2.816 | 0.506 | 0.089 | 0.250 | 11.308 | 0.961 | 10.861 | - | - |

From the above table it is revealed that the C3 serves as cut off rate because after the point the ci value starts decreasing. Therefore, the optimal portfolio consists of stock of EIC, PIC and HGIC. Based on Sharpe's methodology of development of optimal portfolio, the proportions of these securities are 30.93%, 52.52% and 16.55% respectively, as indicated by Z proportion and calculated as Zi divided by sum total of Zi of three securities.

**In the table 4.33, it is revealed that the C3 serve as cut-off rate, which is 13.124.**

**The above table 4.33 shows that dividing each security $Z_i$ by the sum of $Z_i$ to find out the proportion of investment on the portfolio. Hence, the optimal on the consists of stock EIC, PIC and HGIC with 30.93%, 52.52% and 16.55% weights in each stock respectively.**

## 4.11 Testing of Hypothesis

This hypothesis is based on the test of significance of difference between sample means and population mean.

Null Hypothesis ($H_0$): $\mu_1 = \mu_2$ i.e. there is no significant difference between overall market return and return on common stock of insurance companies.

Alternative Hypothesis ($H_1$): $\mu_1 \neq \mu_2$ i.e. there is significant difference between overall market return and return on common stock of insurance companies.

$$t = \frac{\overline{X_1} - \overline{X_2}}{\sqrt{S^2\left[\frac{1}{n_1} + \frac{1}{n_2}\right]}}$$

Where,

$\overline{X_1}$ = Average return of portfolio of insurance sector i.e. $\overline{R}_{I\&F}$ = 0.0607.

$\overline{X_2}$ = Average return of portfolio of market sector i.e. $\overline{R}_m$ = 0.099.

$n_1 = n_2$ = number of observation = 6

$S^2$ = Estimated Std. Deviation of population

$$S^2 = \frac{n_1 s_1^2 + n_2 s_2^2}{n_1 + n_2 - 2}$$

$$= \frac{6\times(0.2717)^2 + 6\times(0.354)^2}{6+6-2}$$

$$= \frac{0.443+0.752}{10}$$

= 0.1195

Where,

$S_1$ = Standard deviation of Insurance Sector (from table no. 4.19)

$S_2$ = Standard deviation of market return (from table no. 4.13)

$S_1$ = 0.2717

$S_2$ = 0.354

Now using the formula,

$$t = \frac{\overline{X_1} - \overline{X_2}}{\sqrt{S^2\left[\frac{1}{n_1}+\frac{1}{n_2}\right]}}$$

$$= \frac{0.0607 - 0.099}{\sqrt{0.1195\left(\frac{1}{6}+\frac{1}{6}\right)}}, = -\frac{0.0383}{0.0398}, \ = -0.962$$

$\therefore |t| = 0.962$

Degree of freedom, n1+n2–2 = 6+6-2 = 10

From the students' t-distribution, the tabulated value of 't' for 10 degree of freedom (d.f.) at 10%, 5%, 2% and 1% level of significance are 1.812, 2.228, 2.764 and 3.169 respectively.

Decision: - since the calculated value of t is less than the tabulated value at all level of significance therefore the null hypothesis is accepted i.e.

average return of common stock of insurance companies and average return on overall market are equal.

## 4.12 Major Findings of the Study

The major findings of this study have been outlined below:

- From sample study of five insurance companies stock, EIC has the highest market capitalization whereas HGIC has the lowest. The average holding period return for all the sample stocks revealed positive. The average return of EIC is observed highest i.e. 30.93% and NLGIC is observed lowest, i.e. 5.62%. However, most of the sample firms from have negative return in recent (2062, 2063 & 2064) years. Such negative return is revealed as a consequence of declining stock market because of declining economic trend and political crises occurred in those years.
- The standard deviation of return on stock of selected insurance companies are found 45%, 77.64%, 63.45%, 48.22%, 34.30% for PIC, EIC, HHGIC, UIC and NLGIC respectively. EIC has highest S.D. and NLGIC has lowest S.D. among five insurance companies. Higher standard deviation indicates higher volatility in stock return and lower indicates lower volatility.
- Similarly, the PIC's CV is minimum i.e. 2.2157 and NLGIC's CV (risk) is the maximum i.e. 6.12. As CV measure the ratio of risk and return, the lower CV is regarded as lower risky and vice versa. So PIC stock is less risky and NLGIC's stock is more risky.
- The sample period market return, based on NEPSE Index, is observed 9.9% with 35.4% standard deviation. The coefficient of variation of market is 3.58 which is very high due to the instable NEPSE index.

- Among the sample insurance companies, while developed the two assets portfolio, the highest portfolio return is 24.6% which is formed from the combination of EIC & HGIC. It indicates that investor can be benefited by forming the portfolio of those stocks. Similarly the lowest portfolio return is 3.25% of EIC & UIC.
- The beta coefficient of PIC, EIC, HGIC, UIC and NLGIC are 1.0934, 1.3203, 1.6117, 1.1931 and 0.7031 respectively. Since beta coefficient of all companies except NLGIC is greater than 1. The beta coefficient greater then 1 indicates that the stocks are aggressive stocks, that means, a small changes in market return brings larger changes in stock's return.
- In the CAPM analysis all the stocks are found under priced except NGLIC. The stocks are under priced because their expected rate of returns is higher then required rate of return.
- The systematic risk proportion of PIC, EIC, HGIC & NLGIC are 73.98%, 36.25%, 80.87%, 76.73% and 52.64% respectively. Stock of PIC, HGIC, and UIC has high systematic risk among five insurance companies. The higher portion of systematic risk indicates that such risks can not be minimized by constructing the portfolio because such risks are known as non diversifiable risks.
- In the Sharpe single index model and by using the concept of Elton et. al (1978) to construct the optimal portfolio it is revealed that the optimal portfolio of sample insurance companies consists of 30.93% invest in security EIC, 52.52% in security PIC, 16.55% invest in security HGIC.
- In t-test, the calculated value is less than the tabulated value so the null hypothesis is accepted. It means expected return of common stock of insurance company is equally to market return at all level of significance.

# CHAPTER – V

# SUMMARY, CONCLUSION AND RECOMMENDATION

## 5.1 Summary and Conclusion

This study focuses on the common stock investment among other securities. Investors of common stock are ultimate owner of the company, who are ultimately associated with risk and return. So to maximize the share price, the finance manager must learn to assets two key determines risk and return. In become easier when there is existence of developed and healthy stock market in the country. Risk and return is getting considerable attention in financial management.

People's participation in the security investment and its dynamic trading pays a very important role in the overall economic development of a nation. The investment environment defects the availability of investment opportunities. The central focus of this study is the risk and return trade off and the relationship between risk and return is described by investor participation about risk and their demand for compensation. No investor will like to invest in risky assets unless he/she is assured of adequate compensation for the acceptance of risk. Hence risk plays a vital role in the analysis of investment. Investor often ask about the total risk they will be assuming in an investment and like to know the risk premium provided is enough. Higher risk will command higher premium and the trade – off between the two assumes a linear relationship between risk and risk premium.

The investor in general, expects two kinds of return on stock investment i.e. dividends and capital gain. Rational investors consciously examine the behavior of stock return sand ultimate risk associated with it and then invest their fund in efficient portfolio from which they can realize higher return with lower risk. But in Nepal, it is found that most of the

investors invest their funds in single securities rather they can be benefited by investing in portfolio through diversification risk.

The study mainly focused at evaluating the risk and return associated with common stock investment of insurance companies in Nepal. The main objectives of the study are to analyze risk and return of the common stocks in the Nepalese market, the study is focused on the common stock of insurance companies. Five listed companies are taken into the consideration to analyze the risk and return. While analyzing the risk and return brief review of related studies has been performed. Research methodology has been used to analyze data and tables, graphs and diagram are used to make the findings sample and to present data in easily form. It is based on only secondary data. The secondary data are collected from Nepal Stock Exchange, NRB, SEBO/N and financial records of studied companies. Finding of analysis are summarized and conclusion are drawn in following paragraphs:

With the sample of five insurance companies PIC, EIC, HGIC, UIC and NLGIC, this study has used the historical data of six years from 2059 to 2064. From the individual study of risk and return patter of sample firms, it is observed that on the basis of market capitalization size of 5 samples EIC is the highest one and HGIC is the lowest.

Regarding the return pattern, all the insurance companies have positive expected return. Expected return of the common stock of EIC is the highest i.e. 30.93% and NLGIC is lowest at 5.62%.among five insurance companies EIC is the best because it has highest return.

The risk associated with common stock of selected insurance companies are found 45%, 77.64%, 63.45%, 48.22%, 34.30% of PIC, EIC, HHGIC, UIC and NLGIC respectively. EIC has highest S.D. and NLGIC has lowest S.D. among five insurance companies. As Standard deviation is not the

single measure of risk, coefficient of variation (CV) also measures the risk and is known as relative measures of risk. The PIC's CV is minimum i.e. 2.2157 and NLGIC's CV (risk) is the maximum i.e. 6.12.

NEPSE as a single stock market, the NEPSE index is in increasing trend up to 2061 and decrease in 2062 to 2061/062 again increase in the year 2063/64. Overall market return is 9.9% risk on common stock of overall market (i.e. S.D.) is 35.4% and coefficient of variation of market is 3.58.

Among the sample insurance companies, while developed the two assets portfolio, the highest portfolio return is 24.6% which is formed from the combination of EIC & HGIC. Similarly the lowest portfolio return is 3.25% of EIC & UIC. The portfolio analysis indicates that forming portfolio can reduce minimum level of the risk. EIC stock has highest unsystematic risk whereas HGIC has lowest unsystematic risk among sample firm's stock.

As Beta coefficient measures the systematic risk and explains the sensitivity or volatility of the stock with market. The beta coefficient of various sample companies of PIC, EIC, HGIC, UIC and NLGIC are 1.0934, 1.3203, 1.6117, 1.1931 and 0.7031 respectively. Since beta coefficient of all companies except NLGIC is greater than 1. It indicates the share is more risky or volatile than market except NLGIC.

The CAPM analysis indicated that the sample of insurance company's stocks except NLGIC is under priced.

While partitioning risk the systematic risk proportion of PIC, EIC, HGIC & NLGIC are 73.98%, 36.25%, 80.87%, 76.73% and 52.64% respectively. Stock of PIC, HGIC, and UIC has high systematic risk among five insurance companies. The stock of NLGIC has equaled both risks. This evidence indicates that while constructing a portfolio to minimize the risk

EIC stock is preferable because the investors can minimize the portfolio risk.

In the due course of developing optimal portfolio by using the Sharpe single index model and by using the concept of Elton et. al (1978) to construct the optimal portfolio it is revealed that the optimal portfolio of sample insurance companies consists of 30.93% invest in security EIC, 52.52% in security PIC, 16.55% invest in security HGIC.

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

## 5.2 Recommendations and Suggestions

**This study is basically conducted to analyze the risk and return for the investors, institution and beneficial for general people. The following are recommendation based on the basis of analysis of data, findings and conclusion.**

- Since the average return and risk of EIC is highest, the aggressive investor can go for EIC stock.
- Risk-adverse investors (Investors who don't want to take risk) should invest in NLGIC because of the lowest average return and risk.
- Among all sample stocks EIC and NLGIC have higher unsystematic risk in comparison to UIC, PIC and HGIC, so they should try to minimize the risk with proper management.
- The correlation coefficient sample stocks are high, that means more than 0.683 which indicates that development of portfolio with highly positive correlated stock will reduce small portion of risk. Hence the investors may not able to reduce the risk significantly even they develop the portfolio.

- The stock of NLGIC has lowest beta among sample i.e. $\beta$ = 0.7030, the defensive beta, which could be, betters one to make a portfolio of different companies. Investors can add this stock to minimize their portfolio risk.
- As PIC, EIC, HGIC and UIC's stocks are under priced and NLGIC's stock is overpriced, the investors can be benefited by buying PIC, EIC, HGIC, and UIC stock and by selling NLGIC stock as signified by CAPM analysis.
- From the Sharpe's Index Model, Investor can be benefited by constructing an optimal portfolio of stocks of EIC, PIC and HGIC with their respective proportions (weight). That means optimal portfolio consists of 30.93% invest in security EIC, 52.52% in security PIC, 16.55% invest in security HGIC. However, it may change as time horizon changes.

**For further Research Avenue some additional recommendations are as follows:**

- One can increase the sample size and sample period to obtain more reliable and valid conclusions.
- A study similar to this should be conducted from time to time. The long-term stability of results needs to be reviewed from time to time.
- A rigorous study on risk return perspectives with more strong or statistical and financial tools is expected.

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