CHAPTER- I

INTRODUCTION

1.1. General Background:

The simple meaning of investment is employing money to generate more money in future. Investment is a process of sacrificing the amount of money at present for future additional benefit including the amount of sacrifice. There are two different attributes generally involved in investment process i.e. time and risk. The sacrifice takes place in the present and which is certain. The reward comes later and the magnitude is generally uncertain.

Return is the primary motive of investment, but it always comprises of some degree of risk. Buying common stocks, bonds, a piece of land, gold or silver are the examples of investment. All these examples involve sacrifice of current rupees in expectation of future return. Hence they all are investment. The main objective of investment is to maximize the wealth of an investor. Being a rational animal, we do not sacrifice anything without expecting return. Investment is nothing but putting money to increase its value in future. It is implied that investors want to maximize his/her wealth in a proper and safe way, investors always endeavor to invest in such sector which provide adequate return on their hard earn money. Whatever may be the type of investment; the major motto is to maximize the return with minimizing the risks involved there on.

Investment in its broadest sense means to sacrifice of current rupees for future more rupees. Nowadays people are becoming more aware to select and invest in proper means of investment. Among them banker's fixed deposit is one of them but the people are not satisfied with the fixed deposit

return due to low interest rate. As the real interest rates provided by banks are negative i.e. they are less than the inflation rate prevailing in the country. So, people started to invest in productive sector like industrial, trading, service, banking sector etc for better return. The form of investment may be different such as a creditors, equity holders, stock holders etc. The decision to investment now is a most crucial decision as the future level of wealth is not certain. Time and risk are the two conflicting attributes involved in the investment decision.

Some investment alternatives are preferred over others since the risk and return characteristics on such underlying investment alternatives satisfy the individual investor's expectations. Return expected on share investment can be partitioned into dividend and capital gain components. Both these two components of the total return on share investment are not certain with investors having to make decisions in an uncertain environment. Investments in shares are risky in relation to the investments in other fixed income securities like treasury bills, saving certificates, etc. Despite the risk element inherent to investment in shares, most investors desire to invest in shares in anticipation that the future price of the stock will increase. The intrinsic, or theoretical, price of the stock today can be ascertained by analyzing publicly disclosed financial investments. Investors, in most cases, do not analyze published financial statement before they make the investment in shares of a given company. The actual market price of the stock striving towards equilibrium must reflect the theoretical value of the stock determined by using some valuation models. Determining the intrinsic value of stock today and comparing it with the actual market price however, are rare in practice.

Over the past decade, the investment in any business is become very risky due to highly volatile in Nepalese economy, inflation, government instability, and the major factor affecting to this is Maoist insurgency and political instability. Nepalese stock market shows a high level of fluctuation when we look as at the overall picture of the stock market. People think twice before they invest in any stock market. This makes the investors more vulnerable towards possible risk, and encourages them to divert their investments to other safer alternatives such as gold, saving deposits, etc, or to spend on current consumption. In Nepalese context, handful of people knows and has interest in investing in stocks. It is very new concept to Nepalese context to invest money in stocks.

Portfolio management is the art of handling a pool of funds. Portfolio management preserves not only its original worth but also appreciates its value and yield over time an adequate return consistent with the level of risk assumed. The objectives of portfolio management is to analyze different individual assets delineate efficient portfolios, provide safety through precaution, risk minimization, generating income, marketability, liquidity et, Generally environment indicates factor which have some influencing power to the object. In the same way, investment environment is the bond of factors which influence the investment. Investment environment refers all internal as well as external factors which can alter in investment decision. Investment environment directly and indirectly influences the financial market. Investment environment consists investors, shareholders, brokers, financial intermediaries, stock exchange, government policies, political and social customs and so on.

If the security markets are highly efficient, a search for undervalued securities is not likely to yield return. If market is efficient, a passive portfolio management practices like indexing the portfolio to some market index may be the most cost effective approach. Active portfolio management practices are only appropriate because of significant market deficiencies that exploited legally and beneficially.

Among these investment processes the research is focused on security analysis and portfolio selection. Security analysis involves examine of individual securities or group of securities within the broad categories of financial assets. Portfolio construction identifies those specific assets in which to invest determining the proportion of the investor's wealth. Diversification should be done to minimize the risk and maximize the return. Portfolio performance involves determining periodically how the portfolio performs in terms of not only the return earned, but also the risk experienced by the investor".*(Sharpe Alexander and Beiley 2003:12-14)*

Financial market facilitates the flow of funds from surplus to deficit units. Those financial markets that facilitate the flow of short-term funds, that is, less than one year are known as money markets, while those that facilitate the flow of long-term funds are known as capital markets. There are two types of market securities. Securities having life less than one year are called money market securities and securities having life of more than one year are called capital market securities. Money market securities generally have higher liquidity whereas capital market securities are used to generate a higher annual return to investors.

"Stock market is a financial market which probably has the greatest glamour and is perhaps the least understood. Some observers consider it as a

legalized heaven for gambling and many investors consider stock marker investing as a game in which the sole purpose is picking winners"*(Lorie and Dodd;1985 : 325)*

1.2. Capital Market in Nepal:

The history of capital market in Nepal starts with the establishment of Biratnagar Jute Mill in 1936 A.D. Thereafter, various mills of rice, cotton, sugar, and others were established. In 1937, Tejarath was set up to facilitate loans to government employees. In the same year, the first industrial Act was promulgated, which was also a favorable step to promote capital market in Nepal. But, the participation of public in the ownership structure of industries was not available and all the shares of companies were gone to Rana families' portfolio. In 1950, democracy was established in the country by throwing Rana regime and the interim government was much busy in devising measures to revive the sick industries and only very little attention could be given to initiate the development of capital market. Important actions were taken during these periods for this sake and various institutions and industries were established. Then, in 1960, Nepal entered into Panchayat System by sacking democracy. Then HMG/Nepal started to issue bonds in 1964. Government bonds still occupy a major chunk of trading in the securities market.

After an extensive study of the working of public limited company HMG/Nepal announced Industrial Policy in 1974. This policy made a provision for the establishment of an institution named Securities Marketing Centre to deal with securities. It was established with the joint effort of Nepal Rastra Bank (NRB) and Nepal Industrial Development Corporation (NIDC) to mobilize the capital among the various industries and companies.

After a passage of few years, this center was changed into Securities Exchange Centre (SEC) in 1976. Securities Exchange Act came into force on 13 April 1984. Since then, SEC started to operate under this act. Before this, it was operating under the Company Act. The main purpose of Securities Exchange Act was to provide systematic and regular environment of market of securities ensuring and protecting the interest of individual and institutional investors as to increase public participation in various firms and companies.

"The interim government initiated financial reform program and established a Citizen's Investment Fund as pioneering capital market institution. The established of NIDC Capital Markets Limited is also another milestone in this regard. Now, Nepal has entered into market-oriented economic system. Thus, necessity was felt to change the whole operation of Stock Exchange Centre to make it compatible with the changing economic system. As a result, HMG/Nepal brought about changes in the existing structure of SEC by separation SEC into two distinct entities –Securities Exchange Board of Nepal (SEBO/N) and Nepal Stock Exchange Ltd. (NEPSE) at the policy level in 1993" *(Shrestha;1992: 15).*

1.3. Nepal Stock Exchange Limited:

Securities Marketing Centre was established to deal with especially the government bonds in 1974. But this center was converted into Securities Exchange Centre (SEC) in 1976. It involved in the management of public issues made by corporate bodies. After eighteen years of incorporation, the Securities Exchange Centre was converted into Nepal Stock Exchange Ltd. (NEPSE) in 1993.

NEPSE is a non-profit organization, operating under Securities Exchange Act. The basic objective of NEPSE is to impart free marketability and liquidity to the government bonds and corporate securities by facilitating transactions in its trading floor through market intermediaries, such as brokers, market maker, etc. Before the conversion into stock Exchange, SEC was only the capital market institution undertaking the job of brokering, underwriting, managing public issue, market making for government bonds and other financial services. *(Nepal Stock Exchange Ltd.; 1994: 1)*

NEPSE opened its trading floor on 13 Jan. 1994 for its newly appointed brokers and market makers.

1.4. Focus of the study:

The main focus of this study is the portfolio analysis of the common stock investment of the various sectors of NEPSE. Common stock is comparatively risky assets than other security in the capital market. The main purpose of the study is to analyze how one can get sustainable profit by minimizing the risk by selecting the proper portfolio composition. For this purpose, market return, expected return, total risk, are analyzed to give an idea to get sustainable profit by diversifying the risk to avoid future loss of the common stock investment.

1.5. Statement of the problem:

Portfolio management is relatively new concept in Nepalese context. Many companies still have no awareness towards it. The study has examined the investor's awareness about the portfolio management of the financial institutions while investing. In this study investors refer to the institutional or individual investors.

Investors can be classified into three categories on the basis of risk and return. First types of investors are risk lover investors who become ready to face high risk in the hope of high return. The second types of investors are risk avoider investors who try to avoid facing high risk and became ready to be satisfied in low return. The third types of investors come along in between these two investors. They are ready to bear medium risk and have medium return. These are the three types of institutional investors. The study has examined whether these investors are aware about the portfolio management of the institutions they are investing or not. It is not necessary that the investors who bear high risk have high return. The investors may bear high risk and have relatively low return or vice versa. The portfolio return is the straight weighted average of returns from the individual assets. But the portfolio risk is affected by the variance of returns as well as the covariance between the returns of individual assets included in the portfolio and their representative weight.

The study has examined about the condition of portfolio management in different business sector whether the institutions have maintained portfolio management or not.

If they have portfolio management then what is the rate of risk in their institutions? And for bearing that risk what is the rate of return they are having. But if the institutions are careless about the portfolio management how much profit maximization they are having and how they are maintaining their earning? What the difference between the rates is of return of the institutions that portfolio management and do not have portfolio management. The study has also tried to find out the relationship between each sector.

In an efficient market condition, stock price is equal to the intrinsic value of stock. When required rate of return and expected rate of return are not equal, then intrinsic value and market value of stock will not be equal. It is also assumed that all stock remain in security market line, and if the case is not so, they strive towards this line. But theoretical and practical knowledge may not always much each other.

Therefore it needs courage and at the sometime faith to invest in common stock. In most of the time which can be generated through proper evaluation with giving view to the prevailing market atmosphere. But what are the criteria for evaluation that the stock they are holding will give them favorable return?

Some research problems are as follows:

1. In what extent, the investors should be compensated for taking a certain degree of risk?
2. How do they know the scale and intensity of risk?
3. One expects favorable returns by holding stock. But what are the criteria for evaluation?
4. How can one make higher return assuming lower risk?

1.6. Objectives of the study:

The objectives of the study are as follows:

i. To analyze portfolio attributes of Nepalese Stock Market in relation to risk and return.

ii. To measure the optimum portfolio by using Jack Treynor, William Sharpe and Michael Jensen Models among the different sectors.

1.7. Scope and limitations of the Study:

This study is to fulfill the requirement of Master Degree in Business Studies. It cannot cover all the dimension of the subject matter and resource. The major limitations of the study are as follows.

- The problem of non-availability of required data and information regarding portfolio management may limit the scope of the study.
- The study has only analyzed index of different business sector of NEPSE.
- The study has not analyzed dividend yield of each sector due to unavailability of needed data and limited time period.
- The study is mainly depending on secondary data.
- Risk and return measurement is taken as the tools of the methodology.
- Average return of the individual business sector is taken as expected return.
- Since the Treasury bill issued by NRB is only of short term of 91 days, there is confusion in calculating risk free rate. So, it is calculated required rate of return using treasury bills annualized rate and national saving bond interest rate as risk free rate.

1.8. Significance of Study:

The study has the following significance:

i. The study will be helpful to know about the risk-adjusted portfolio.

ii. The study will be guiding the investors to create a suitable and productive portfolio in the Nepalese stock market.

iii. The study can be the path for the future researcher in doing the in-depth study on the risk-adjusted portfolio analysis.

1.9. Organization of Study:

This research has been organized in five chapters. The titles of these chapters are listed below

Chapter-I: Introduction

This chapter is introductory and deals with subject matter of the study including general background of the study, problem of the study, objectives of the study, significance of the study, limitation of the study, organizing of the study etc.

Chapter-II: Review of Literature

This chapter contains the profound review of available literature related to the area of this study. It is directed towards the review of conceptual framework and review of major related studies. Risk and return, its relationship, determinants, measuring techniques and methods etc. are reviewed from the various available literatures.

Chapter-III: Research Methodology

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

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

Chapter-IV: Presentation and Data Analysis

This chapter presents the analysis and presentation of data by using various methods of statistical and financial tools. Tables, charts, etc. will be used accordingly. This chapter also includes major findings of the study.

Chapter-V: Summary, Conclusion and Recommendation

This chapter is for summary of conclusion, recommendation and suggestions for further important.

CHAPTER- II

REVIEW OF LITERATURE

2.1. Conceptual Framework:

2.1.1. Capital Market:

The capital market refers to the market where long-term funds are borrowed and lent. In other words, it refers to the links between lenders and borrowers of funds arranging a funds transfer process to seek each other's benefit. It is just the market for capital funds. The word "capital" used in this context implies a long-term commitment on the part of the lender and a long-term need for the funds on the part of the borrower. Both lenders and borrowers coming together in capital market play effective financial intermediary role in primary and secondary market through the use of various long-term capital market instruments like common stocks, bonds, preferred stocks, convertible issues, etc. Thus strictly speaking, the market encompasses any transaction involving long-term debt or equity obligations.

In literary sense, the term "capital market" is used to describe the institutional arrangements for facilitating the borrowing and lending of long-term funds. Businesses, in the form of public limited companies require long-term or permanent capital in order to finance their activities, or to undertake expansion schemes. Similarly, government needs large quantities of funds in order to be able to provide and expand services such as education, health-care, and defense. In order to meet their money demands to fulfill their objectives, both companies and government raise money by issuing different securities.

Stock exchange plays a significant role in mobilizing funds in capital market. Investment institutions, unit trusts, industrial banks, insurance companies, etc, also raise funds from public and sometimes from government too through various securities and use them in long-run investments. Securities dealt in capital market are long-term securities. Some securities are of perpetual nature and others are for a longer period. Debentures may be either redeemable or irredeemable, the proceeds of life insurance policies may be repayable at death or at maturity so stock exchange, investment trusts and insurance companies are the major segments of capital market.

In many developing countries, the unorganized capital market is still a prevailing characteristic of the economy. But it has crucial role to play in channeling funds from savers to users as they hold huge amounts of the financial assets.

"The capital market can be usefully sub-divided into the primary market and the secondary market. The primary market deals with the selling of new securities whereas the secondary market deals the securities previously issued in the market." *(Luckett; 1984: 147)*

2.1.2. Primary Market:

"Securities available for the first time are offered through the primary markets. The issuer may be the brand new company or one that has been in business for many years. Primary market is used to denote the market for the original sale of securities by an issuer to the pubic. The volume of new issues in the primary market, particularly of common stock, is directly related to market conditions. When the market is high or rising, the number

or new issues being offered to the public rises and when the market is low or falling, the number declines."*(Weston and Brigham; 1981: 375)*

"The institution that dominates the primary market is the investment – banking house. It is a traditional middleman in the primary market. When a company decides to acquire new funds from the outside, it will frequently do so through the intermediation of an investment banker in the developed countries. The investment banker's principal activity is to bring sellers and buyers together in the market. They are specialists in the marketing of new securities. They advise companies in the design of the security. Although there are a number of possible arrangements, the investment-banking house underwrites a new issue of securities. In underwriting agreement, an investment banker agrees to buy the securities from the issuing company and sells them to the public. In addition, placing new securities through the intermediation of investment bankers, many companies engage in the private placement of securities. In private placement, the issuer of the securities sells securities directly to investors without the underwriting services of an investment banker. This method is cheaper, and it avoids the underwriting costs." *(Luckett; 1984: 147)*

2.1.3. Secondary Market:

Securities that have been previously issued are traded in the secondary market. The majority of all capital market transactions occur in the secondary market. The majority of all capital market transactions occur in the secondary market. The proceeds from sale of securities in the secondary market do not go to the original issuer but to the owners of the securities. In other words, securities are traded among the individual as well as institutional investors.

“ The function of the secondary market is to provide liquidity for securities purchased in the primary markets. Once investors have purchased securities in the primary market, they need to place them in the secondary market in order to sell. Secondary markets are further divided into the over-the-counter market and the registered stock exchanges.” *(Brigham and Houston; 2001:174)*

2.1.4. The Over-the-Counter Market:

“ The over-counter-market (OTC) is the market for the securities not listed on the stock exchanges. When the company first sells its securities to the public, the securities are traded in the OTC. It includes all transactions in securities other than those taking place on registered stock exchanges. In practice, however, the term is usually limited to the activities of dealers and brokers may range in size from very large houses doing an international business to one person firms that trade only in local markets.” *(Brigham and Houston; 2001:186).*

2.1.5. The Stock Exchanges:

“Stock exchanges are voluntary associations of members who come together for the purpose of buying and selling, for the general public, the securities of the great companies. Only listed securities are traded in the exchanges and are bought and sold through "auction". The members of these exchanges are truly a national market in which virtually anyone may participate.” *(Lucket;, 1984: 144)*

“The stock exchanges play an indispensable role in mobilizing funds in capital market. The essential function of a stock exchange is to provide active market for already issued securities. The essential function of a stock

exchange is to provide active market place for corporate share and other listed securities. The various virtues governing stock exchange include enhanced marketability of securities, rational allocation of investible funds, enhanced economic growth and wealth generation and proper maturity, liquidity, marketability and diversification of investment. The growth of capital market through the vehicle of stock exchange has brought a flow of the information about various securities in addition to the sound listing criteria that prove worthwhile to the investors. However, the secondary market is said to give liquidity to primary issues, and this liquidity is an essential ingredient in the capital formation process of the economy." *(Robinson and Wrightsman,; 1981:375)*

2.1.6. Return on Common Stock:

2.1.6.1. Returns:

A major purpose of investment is to get a return or income on the funds invested. On a bond an investor expects to receive interest and on stock dividends may be anticipated. So return from investment has different meaning to different investors. Some companies seek near term cash inflows and give less value to more distant returns. Other investors are concerned primarily with growth. Still others measure return using financial ratios. They might seek to invest in a company that has a high return on investment.

Investor wants to maximize expected returns subject to their tolerance for risk. Return is the motivating force and it is the key method available to investors in comparing alternative investments. Realized returns and expected returns are two terms which is often used in the language of investment. Realized return is after the fact return, return that was earned or it is history. Expected return is the return from an asset that investor will

earn over some future period. It is a predicted return, which may or may not occur.

The rate of return formula can be restated in a form appropriate for almost any investment.

Single period rate of return (Υ_t) = $\frac{Ending\,\text{Price} - Beginning\,\text{Price} + Dividend}{Beginning\,\text{Price}}$

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

Where, P_t = Stock price at the end of period t.

P_{t-1}= Stock price at the end of period t-1.

D_t = Cash dividend received during the t^{th} period.

This formula can be used to calculate both actual single period return (base on historical data) as well as expected single period return (based on expected dividend and price). *(Cheney and Moses, 2000:34).*

2.1.6.2. Expected Rate of Return:

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

The simple arithmetic mean, $E(r_t) = \frac{\sum_{t=1}^{n} r_t}{n}$

Where, $E(r_t)$ = Arithmetic mean of return

n = Number of year

r_t = single period rate of return

"The expected rate of return or holding period return is based upon the expected cash receipts over the holding period and the expected ending or selling price. Depending upon the assumption made about cash receipts and ending price, a number of expected rates of return are possible. These possible rates of return estimated by the investor are summarized in an expected rate of return. The expected rate of return must be greater or equal to the required rate of return in order for the investor to find the investment acceptable" *(Cheney and Moses; 2000:34).*

2.1.6.3. Risk:

"Risk and uncertainty are real in life. Everyone encounters uncertainty in everyday life. Uncertainty about the weather, about the performance of one's investment and about one's health. Uncertainty exists when a decision maker knows all the possible outcomes of a certain act but for one reason or another cannot assign probabilities to the various outcomes.

Risk, on the other hand exists when the decision maker knows not only the various outcomes but also the probability associated with each one.

Risk and uncertainty are an integral part of an investment decision. Risk can be defined as a situation where the possible consequence of the decision that is to be taken is known. 'Uncertainty' is generally defined to apply to situations where the probabilities cannot be estimated. However risk and uncertainty are used interchangeably.

In finance risk has a very special meaning. It refers to the uncertainty associated with the returns on a particular investment. A risky investment is thus one whose returns are volatile." *(Weston and Brigham; 1993)*

2.1.6.4. Measurement of Risk:

"Standard Deviation is a statistical concept and is widely used to measure risk from holding a single asset. The standard deviation is derived so that a high standard deviation represents a large dispersion of return and is a high risk; a low deviation is a small dispersion and represents a low risk. It provides more information about the risk of the asset. Its advantage is that the uncertainties of returns can b e summarized into a single easily calculated number. The major disadvantage is that the standard deviation considers possible returns above the expected value to be as risky as returns below the expected value." *(Weston and Brigham; 1993)*

Standard deviation is donated by the 'σ' (sigma) symbol. It can be expressed mathematically as:

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

where,

σ = Standard deviation

r_t = Return for t^{th} possibility

E(r) = Expected rate of return

n = Number of years.

2.1.6.5. Coefficient of Variation:

If risk is measured by the standard deviation, then risk per unit of expected return can be measured by the coefficient of variation (C.V.). The larger the C.V the larger the relative risk of the investment.

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

The standard deviation can sometimes be misleading in comparing the risk or uncertainly surrounding alternatives if they differ in size. To adjust for the size or scale, problem, the standard deviation can be divided by the expected return to compute the coefficient of variation (C.V.)

$$\text{Coefficient of Variation (C.V.)} = \frac{\pm}{E(r)}$$

Where, σ = Standard deviation

E(r) = Expected rate of return.

The coefficient of variation is a measure of risk per unit of expected return.

The coefficient of variation is more useful when we consider investments, which have different expected rates of return and different levels of risk. *(Weston and Brigham; 1993)*

2.1.6.6. The Beta Coefficient:

The beta coefficient ( ), a measure of systematic risk, can be calculated by using the following formula:

Beta coefficient ($_i$) = $Cov_{iM} / \pm_M^2$

Cov_{iM} is the covariance between the return of an individual asset and the returns of the market and $\pm_M^2$ is the variance of the market returns.

The CAPM contends that shares co-move with the market. If the market moves by 1% and a share has a beta of two, then the return on the share would move by 2%. The beta indicates the sensitivity of the return on shares with the return on the market.

Some companies activities are more sensitive to changes in the market- e.g. luxury car manufacturers- have high betas, while those relating to goods and services likely to be in demand irrespective of the economic cycle- e.g. food manufacturers-have lower betas. The beta value of 1.0 is the benchmark against which all securities' betas are measured.

Stocks can be classified as aggressive or defensive or average depending on the value of beta coefficients.

Table : 2.1

Beta and Stocks classification

Beta coefficient ( )	**Stocks classification and degree of risk**
Beta coefficient exactly equals to 1	Average stock; equally risky as the market
Beta coefficient greater than 1	Aggressive stock; more risky than the market
Beta coefficient less than 1	Defensive stock; less risky than the market

2.1.7. Portfolio Return and Risk:

Portfolio is combination of individual or a group of assets. Portfolio is the holding of securities and investment in financial assets like, common stock, preferred stock, bound, debenture etc. Investor has different types of investment opportunity but they have limited resource for investment so that investors have to select that investment, which maximizes return for a given level of risk. Therefore it is needed to extent analysis of risk and return to include portfolio. There are two types of objectives, primary objective and secondary objective. The primary objective of portfolio are to maximize return and to minimize risk and secondary objectives is regular and stable return, safety of investment, appreciation of capital, tax benefits etc.

"The expected return on a portfolio 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,

$$E(r_p) = w_i E(r_i) + w_j E(r_i)$$

where, $E(r_P)$ = portfolio return

w_i = proportion of wealth invested in i assets.

w_j = proportion of wealth invested in j assets.

$E(r_i)$ = expected return on i assets.

$E(r_j)$ = expected return on j assets.

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

Symbolically,

$$\sigma_P = \sqrt{w_i^2 \pm_i^2 + w_j^2 \pm_j^2 + 2 w_i w_j \operatorname{cov}(R_i, R_j)}$$

where,

σ_P = Portfolio standard deviation

w_i = The proportion of portfolio devoted by security i .

σ_i = The standard deviation of security i.

w_j - The proportion of portfolio devoted by security j.

σ_j =The standard deviation of security j

Cov (R_i, R_j) = Covariance between return of security i and j." *(Weston and Brigham; 1993)*

2.1.8. The Conventional Theory of Performance Evaluation:

Calculating average portfolio returns does not mean the task is done. Returns must be adjusted for risk before they can be compared meaningfully. The simplest and most popular way to adjust returns for portfolio risk is to compare rates of return with those of other investment funds with similar risk characteristics, for example, high-yield bond portfolios are grouped into one "universe", growth stock equity funds are grouped into another universe, and so on. Then the (usually time-weighted) average returns of each fund within the universe are ordered, and each portfolio manager receives a percentile ranking depending on relative performance with the comparison

universe. For example, the manager with the ninth-best performance in a universe of 100 funds would be the 90th percentile manager. Her performance was better than 90% of all competing funds over the evaluation period.

"Methods of risk-adjusted performance evaluation using mean-variance criteria came on stage simultaneously with the capital asset pricing model. Jack Treynor, William Sharpe and Michael Jensen recognized immediately the implications of the CAPM for rating the performance of managers. Within a short time, academicians were in command of a battery of performance measures, and a bounty of scholarly investigation of mutual fund performance was pouring from ivory towers. Shortly thereafter, agents emerged who were willing to supply rating services to portfolio managers eager for regular feedback. This trend has since lost some of its steam." *(Bodie and et.a; 2005:888-890)*

2.1.8.1. Sharpe's Measure:

"William Sharpe has attempted to get a summary measure of portfolio performance. His measure properly adjusts performance for risk. The Sharpe Index is given by:

$$S_t = \frac{\bar{r}_t - r^*}{\sigma_t}$$

Where; S_t= Sharpe Index

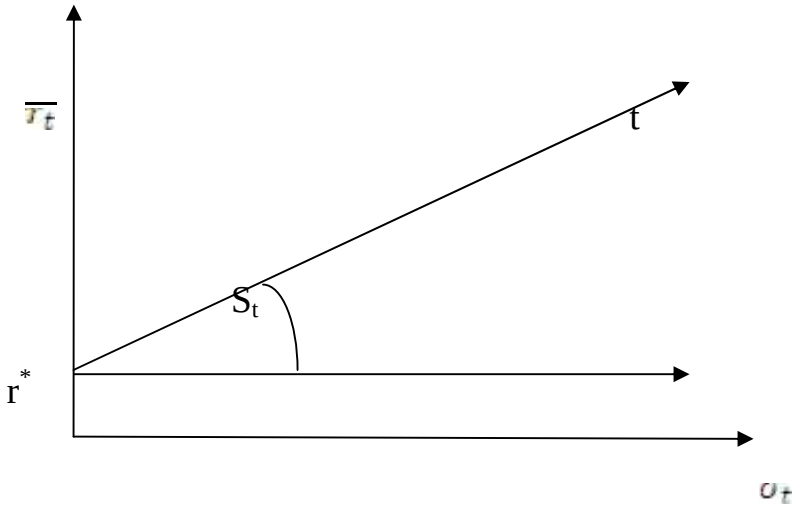
$\bar{r}_t$= Average Return on portfolio t

r^*= Riskless rate of interest

σ_t = Standard deviation (risk) of the returns of portfolio t

Figure No.2.1.

Graphical Representation of Sharpe Index, S_t



Thus, the Sharpe index measures the risk premiums of the portfolio where the risk premium is the excess return required by investors for the assumption of risk) relative to the total amount of risk in the portfolio." *(Fischer and Jordan, 2001:666)*

Graphically, the index, S_t, measures the slope of the line emanating from the risk less rate outward to the portfolio in question. Thus, the Sharpe index summarizes the risk and return of a portfolio in a single measure that categorizes the performance of the fund on a risk-adjusted basis. The larger the S_t, the better the portfolio has performed. (Fischer and Jordan; 2001:666)

"The Sharpe ratio (or reward-to-variability ratio) is a measure of risk-adjusted performance that uses a benchmark based on the ex-post capital market line (CML)." *(Sharpe Alexander and Beiley; 2006:844)*

2.1.8.2. Treynor's Measure:

Closely related to the ex-post alpha measure of portfolio performance is a measure known as the reward-to-volatility ratio. *(Sharpe Alexander and Beiley; 2006:843)*

"A key to understand Treyonr's portfolio-performance measure is the concept of a characteristic line. The slope of the characteristic line is the beat coefficient, a measure of the portfolio's systematic risk. Some people view systematic risk as a type of volatility measure. Thus, by comparing the slopes of characteristic lines, the investor gets an indication of the fund's volatility. The steeper the line, the more systematic risk or volatility the fund possesses, Treynor has proposed incorporating these various concepts into a single index to measure portfolio performance more accurately.

This index is given by the following equation: $T_n = \frac{\overline{r}_n - r^*}{\beta_n}$

Where; T_n= Treynor Index

$\overline{r_n}$ = Average Return on portfolio n

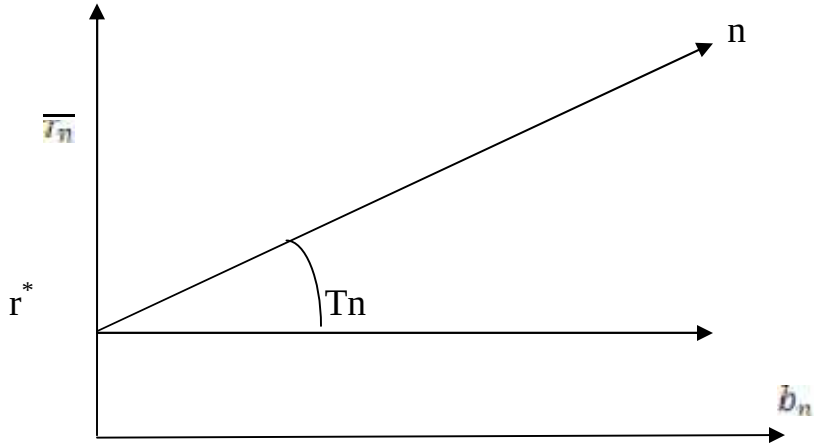
r^* = Riskless rate of interest

β_n = Beta coefficient of portfolio n

returns of portfolio t

Figure No.2.2.

Graphical Representation of Treynor Index, T_n



Thus, the Treynor Index measures the risk premium of the portfolio, where risk premium equals the difference between the return of the portfolio and the riskless rate. This risk premium is related to the amount of systematic risk assumed in the portfolio. So, the Treynor index sums up the risk and return of a portfolio in a single number, while categorizing the performance of the portfolio. Graphically, the index measures the slope of the line emanating outward from the riskless rate to the portfolio under consideration." *(Fischer and Jordan;2001: 667-668)*

2.1.8.3. Jensen's Measure (Portfolio Alpha):

"The Treynor and Sharpe Indexes provide measures for ranking the relative performances of various portfolios, on a risk-adjusted basis, Jensen attempts to construct a measure of absolute performance on a risk-adjusted basis- that is, a definite standard against which performance of various funds can be measured. This standard is based on measuring the "portfolio manager's predictive ability- that is, his ability to earn returns through successful prediction of security prices which are higher than those which we would expect given the level of riskiness of his portfolio. In other words, we are

attempting to determine if more than expected returns are being earned for the portfolio's riskiness." *(Fischer and Jordan; 2001:669)*

"A simplified version of his basic model is given by:

$$\bar{R}_{jt} - R_{Ft} = \alpha_j + \beta_j (\bar{R}_{Mt} - R_{Ft}) \text{-------(i)}$$

Where; $\bar{R}_{jt}$ = Average return on Portfolio j for period t

R_{Ft} = Riskless Rate of interest for period t

α_j = Intercept that measures the forecasting ability of the portfolio manager

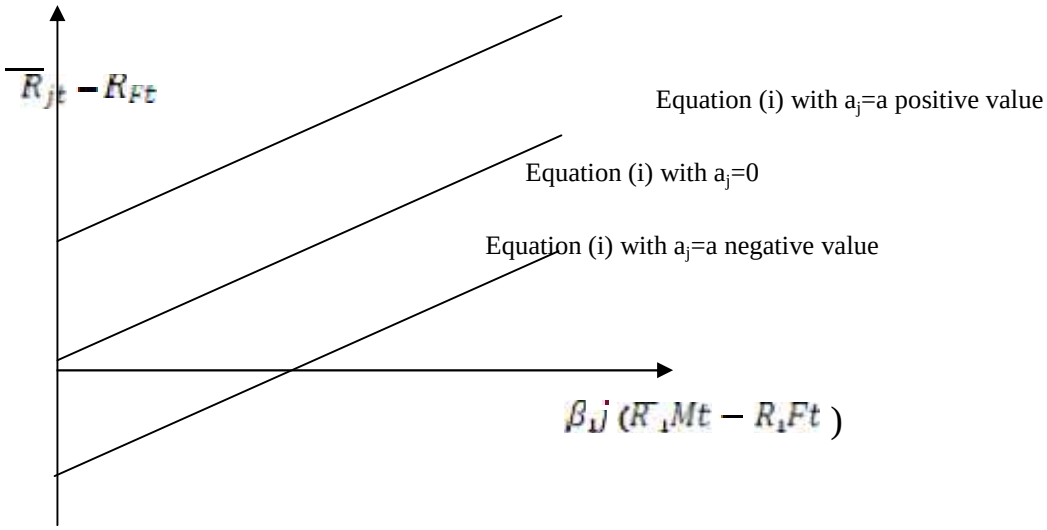
β_j = A measure of systematic risk

$\bar{R}_{Mt}$ = Average return of a market portfolio for period t

It is an ex-post characteristic line.

Figure No.2.3.

Graphical Representation of Jensen's Measure of Management Ability



In the Jensen model, the intercept can be at any point, including the origin. For example, in Figure No.2.3, the upper line represents a case of superior management performance. In fact, α_j = a positive value represents the

average superior management return accruing to that particular portfolio because of superior management talent. The line α_j=0 indicates neutral performance by management; that is, management has done as well as unmanaged market portfolio or a large portfolio, randomly selected portfolio manager with a naïve buy-and-hold strategy. The lower line, α_j = a negative value, indicates inferior management performance, because management did not do as well as an unmanaged portfolio of equal systematic risk. This situation could arise in part because portfolio returns were not sufficient to offset the expenses incurred in the selection and managing process." *(Fischer and Jordan;2001:669-670)*

"The intercept may be interpreted in this fashion by examining equation (i). This occurs because if the portfolio manager is performing in a superior fashion, his intercept will have a positive value because it will indicate that his portfolio is consistently over performing the overall market. This would happen if he either had superior ability in selecting undervalued securities or had superior ability in recognizing turning points in the market. Conversely, if the intercept were negative, it would indicate that the manger consistently underperformed the overall market. That is, the risk-adjusted returns of his portfolio were consistently lower than the risk-adjusted returns of the market over the same period of time." *(Fischer and Jordan;2001:670)*

2.1.8.4. Information Ratio (Appraisal Ratio):

"The information ratio divides the alpha of the portfolio by the non-systematic risk of the portfolio called "Tracking error" in the industry. It measures abnormal return per unit of risk that in principle could be diversified away by holding a market index portfolio." *(Bodie and et.al; 2006:890)*

Information Ratio=$\frac{\alpha_p}{\sigma(e_p)}$

2.1.8.5. M-Squared:

"The measure of M-squared uses standard deviation as the relevant measure of risk. Thus, like the Sharpe ratio, it is based on the ex-post CML. This measure simply takes a portfolio's average return and determines what it would have been if the portfolio's had had the same degree of total risk as the market portfolio." *(Sharpe and et.al; 2006:846)*

$$M_p^2 = \overline{r_f} + SR_p \sigma_m$$

Where, $\overline{r_f}$ =Risk-free Rate

SR_p = Sharpe Measure

σ_m = Standard Deviation of Market

"A variant of Sharpe's measure was proposed by Graham and Harvey, and later popularized by Leah Modigliani of Morgan Stanley and her grandfather Franco Modigliani, past winner of the Nobel Prize for economics. Their approach has been dubbed the M^2 measure (for Modigliani-squared). Like the Sharpe ratio, the M^2 measure focuses on total volatility as a measure of risk, but its risk-adjusted measure of performance has the easy interpretation of a differential return relative to the benchmark index." *(Bodie and et. al; 2006:891)*

To compute the M^2 measure, we imagine that a managed portfolio, P, is mixed with a position in T-bills so that the complete, or "adjusted", portfolio matches the volatility of a market index. The adjusted portfolio, which we call P^*, would then have the same standard deviation as the index. (If the

managed portfolio had lower standard deviation than the index, it would be leveraged by borrowing money and investing the proceeds in the portfolio.) Because the market index and portfolio P^* have the same standard deviation, we may compare their performance simply by comparing returns. Thus is the M^2 measure :*(Bodie and et.al; 2006:891)*

$$M^2=r_{p*}-r_m$$

2.2. Review of the Past Study:

2.2.1. Review of Journals and Articles :

Good et.al. *(1976*) in their article "*Investor's Guide to the Index Fund Controversy*" have explained that the index fund is constructed to have a beta of 1.0 with respect to the SandP 500 Index if that is the index being emulated. In fact, an ideal index fund would be one holding all available common stocks in exact proportion to their outstanding market vale. However, such an ideal fund would actually be impossible to construct and manage. Therefore, one hopes an SandP 500 Index fund will e a good surrogate for this ideal type of fund.

Damato and McGough *(1998)* in their article "*New Gauge Measure Mutual-Fund Risk*" has discussed on the Leah Modigliani reshuffled the best-performing funds of the past five years, using a new gauge of risk-adjusted performance she developed with her grandfather, Nobel laureate France Modigliani.

They added that the work of Leah Modigliani was to encourage investors to consider not only raw performance but also volatility along the way, and to identify funds that have delivered the best results relative to the risks they

took. They found that many investors aren't paying enough attention to risk. Hence, the appeal of risk-adjusted measures such as M-squared.

Shrestha *(2001*) in his article "*Cry for a Nepali*" *CRA* has the opinions on the importance of CRA in context to the development of the stock market in Nepal. He has pointed on through the perspective of the corporate investors and the general investors. He has stated that the general investors cannot rate the credibility of the instruments issued by various companies. So, they suffer because of lack of accurate and timely information. Similarly will be the situation for the corporate investors. So, there might occur in the decision on creating the optimum portfolio. Thus, he recommended for the urgent need of the credit rating agency in the development of the Nepalese capital market.

Ghimire (2002) in his article "*Buy! Buy!*" has given the guide line to the Nepalese investors to make the saving habit and make the logical diversify the investment equally. He pointed out the long term investors to seriously consider the 'market timing', which is the most enabling factor for creation of wealth through the stock market. He has also described the portfolio creation to the listed shares of commercial banks in Nepse to grab the opportunity by the investors. He has given the idea and awareness on the method of decreasing the average cost of the investors' portfolio down.

Paudel (2002) in his article "*Investing in Shares of Commercial Banks in Nepal: An Assessment of Return and risk Elements*" has attempted to determine whether the shares of commercial banks in Nepal are correctly priced and to trace their future price movements when striving towards equilibrium. The correlation coefficients between the returns on individual

shares and the return on market portfolio have been analyzed with the objective of decomposing the total risk into systematic and unsystematic components.

2.2.2.Review of Thesis:

Khatiwada *(2006)* in his thesis "*Optimum Portfolio Analysis of Listed Companies from the Perspective of Investors*" took 56 "A" class listed companies namely: 11 commercial banks, 1 development bank, 11 insurance companies, 32 finance companies and 1 manufacturing company. But only 35 companies were taken as sample for study purpose considering 5 F/y data. He has done the portfolio measures using Sharpe's, Treynor's and Jensen's Portfolio Performance Measure in his study. He has also done the CV and beta analysis for portfolio measure. He found Citizen Investment Trust shares as the best portfolio creator according to Sharpe's measure, Siddhartha Finance Company Ltd.'s shares as per Treynor's as well as Jensen's measure. Similarly, he found from securities of Nepal SBI bank Ltd., Everest bank Ltd., Mahalaxni Finance Company Ltd., and Siddhartha Finance Company Ltd. to be optimal as per Markowitz diversification. He recommended using the various measure models for the selection of assets for investments.

Objectives of Khatiwada's thesis:

1 To analysis portfolio attributes of finance and Commercial Bank.

2 To measure the optimum portfolio by using Sharpe's,Treynor's and Jenses's

Bhattarai *(2008)* in his thesis "*Formation of Optimum Investment Portfolio in Grade "A" Companies Listed in Nepal Stock Exchange*" has taken "A" class 9 commercial banks, 9 finance companies and 6 insurance companies

for creating the portfolios. She found that the return characteristic of the stock of Nabil Bank was the best for investment. She also found that the stocks selected for portfolio purpose were negatively correlated. Therefore, she recommended constructing investment portfolio among the stocks of different industries rather than limiting within one industry.

Objectives of Bhattarai's Thesis:

1 To analysis portfolio of Companies listed in Nepal Stock Exchange.

2 To measure optimum portfolio by using Sharpe's Index

Adhikari *(2009)* in his thesis "*Selection of Optimal Portfolio in Nepal Stock Exchange (NEPSE)*" has taken "A" class listed companies in NEPSE of 71 companies, of which 17 companies were taken as sample. She has found the shares of NIDC as the best share according to Sharpe's measure. From her primary data analysis, Nepalese investors were not in consideration of revising their portfolio. She also found that most of the investors were giving priority to banking securities for creating portfolios. She also found that most of the investors were giving priority to banking securities for creating portfolios. She also found the investors who used to measure the portfolio performance measure in Nepal prefer to use Sharpe's Index.

Objectives of Adhikari's thesis:

1 To analysis portfolio attributes of "A" class listed company in NEPSE.

2 To Measure the optimum portfolio by using Sharpe's index

CHAPTER- III

RESEARCH METHODOLOGY

3.1. Research Design:

Research design is necessary to fulfill the objectives of well-set research. Research design may be defined as framework, plan and structure for collecting, analyzing and evaluating data. It is a procedure and techniques, which provide ways for research viability.

This research is belongs to market prices analysis and portfolio risk and return analysis so the research is based on recent historical data of last five years. Since the given time to finish the research is very limited, more part of the research is analytical rather than descriptive.

3.2. Population and Sample of Data:

The populations of the study are the all the listed companies in the secondary market of the Nepal. The study has covered the following companies:

- Nabil Bank Ltd.
- Himalayan Bank Ltd.
- People's Finance Company Ltd.
- Union Finance Company Ltd.
- Ace Development Bank Ltd.
- Sahayogi Vikas Bank Ltd.
- Chilime Hydropower Company Ltd.
- National Hydropower Company Ltd.

From the above sectors, ${}^{n}C_{r} = \frac{n!}{(n-r)!\,r!} = \frac{8!}{(8-2)!\,2!} = 28$ portfolios have been created for the research purpose.

3.3. Sources of Data:

The data required for the preparation of this report are collected secondary sources. For the collection of the secondary data, the official website of Nepal Stock Exchange Limited and Securities Board of Nepal's www.nepalstock.com and www.sebon.com have been visited.

3.4. Data Collection Procedures:

The collected data have been collected from the respective official websites of the NEPSE and SEBON.

3.5. Tools Used:

The tools used in the analysis of the secondary data are mainly financial and statistical. The major tools used in the study are as follow:

3.5.1. Sharpe's Measure:

The Sharpe Index is given by:

$$S_t = \frac{\overline{r}_t - r^*}{\sigma_t}$$

Where; S_t= Sharpe Index

$\overline{r_t}$= Average Return on portfolio t

r^*= Riskless rate of interest

σ_t = Standard deviation (risk) of the returns of portfolio t

3.5.2. Treyner's Measure:

This index is given by the following equation:

$$T_n = \frac{\bar{r}_n - r^*}{\beta_n}$$

Where; T_n = Treynor Index

$\bar{r}_n$ = Average Return on portfolio n

r^* = Riskless rate of interest

β_n = Beta coefficient of portfolio n

3.5.3. Jensen's Measure:

A simplified version of Jensen's basic model is given by:

$$\bar{R}_{jt} - R_{Ft} = \alpha_j + \beta_j (\bar{R}_{Mt} - R_{Ft})$$

Where; $\bar{R}_{jt}$ = Average return on Portfolio j for period t

R_{Ft} = Riskless Rate of interest for period t

α_j = Intercept that measures the forecasting ability of the portfolio manager

β_j = A measure of systematic risk

$\bar{R}_{Mt}$ = Average return of a market portfolio for period t

3.5.4. Information Ratio:

It measures abnormal return per unit of risk that in principle could be diversified away by holding a market index portfolio. The information ratio or appraisal ratio is used as:

$$\text{Information Ratio} = \frac{\alpha_p}{\sigma(e_p)}$$

3.5.5. M-Squared:

It measures the return an investor would have earned if the portfolio has been altered by use of the risk-free rate through borrowing or lending in order to match the market portfolio's risk level as measured by standard deviation.

$$M_p^2 = \overline{r_f} + SR_p \sigma_m$$

Where, $\overline{r_f}$ =Risk-free Rate

SR_p = Sharpe Measure

σ_m = Standard Deviation of Market

3.5.6. Coefficient of Variation:

If risk is measured by the standard deviation, then risk per unit of expected return can be measured by the coefficient of variation (C.V.). The larger the C.V the larger the relative risk of the investment.

$$\text{Coefficient of Variation (C.V.)} = \frac{\pm}{E(r)}$$

Where, σ = Standard deviation

E(r) = Expected rate of return.

The coefficient of variation is a measure of risk per unit of expected return. The larger the C.V., the larger the relative risk of the investment.

3.5.7. Spearman's Rank Correlation:

Sometimes we come across statistical series in which the variables under consideration are not capable of quantitative measurement but can be arranged in serial order. This happens when we are dealing with qualitative characteristics (attributes) such as honesty, beauty, character, morality, etc., which cannot be measured quantitatively but can be arranged serially. In such situations Karl Pearson's coefficient of correlation cannot be used as such. Charles Edward Spearman developed a formula which consists in obtaining the correlation coefficient between the ranks of *n* individuals in the two attributes under study.

Spearman's rank correlation coefficient, usually denoted by

$$r_s = 1 - \frac{6\sum d^2}{n(n^2-1)}$$

Where *d* is the difference between the pair of ranks of the same individuals in the two characteristics and *n* is the number of pairs.

Similarly, z-test under rank correlation can be tested as follow:

$$\therefore z_{cal} = \frac{r_s - 0}{\sigma_{r_s}} \quad \text{where}, \sigma_{r_s} = \frac{1}{\sqrt{n-1}}$$

CHAPTER- IV

PRESENTATION AND ANALYSIS OF DATA

4.1. Sharpe's Measure:

Sharpe index measures the risk premiums of the portfolio where the risk premium is the excess return required by investors for the assumption of risk) relative to the total amount of risk in the portfolio. $S_t = \frac{\overline{r_t} - r^*}{\sigma_t}$ Where;S_t= Sharpe Index, $\overline{r_t}$= Average Return on portfolio t, r^*= Riskless rate of interest, and σ_t = Standard deviation (risk) of the returns of portfolio t.

Table : 4.1.

Sharpe's Measure

Portfolio	$\overline{r_p} - \overline{r_f}$	σ_p	S_t	**Rank**
Nabil and HBL	33.626%	22.23	1.51	4
Nabil and PFCL	72.646%	90.46	0.80	20
Nabil and UFCL	33.196%	25.20	1.32	6
Nabil and AcDBL	49.856%	38.91	1.28	8
Nabil and SVBL	76.766%	84.77	0.91	15
Nabil and CHPCL	48.756%	35.36	1.38	5
Nabil and NHPCL	39.256%	21.32	1.84	3
HBL and PFCL	56.366%	88.90	0.63	27
HBL and UFCL	16.916%	18.34	0.92	14
HBL and AcDBL	33.576%	34.95	0.96	13
HBL and SVBL	55.406%	83.08	0.67	26
HBL and CHPCL	32.476%	30.82	1.05	12

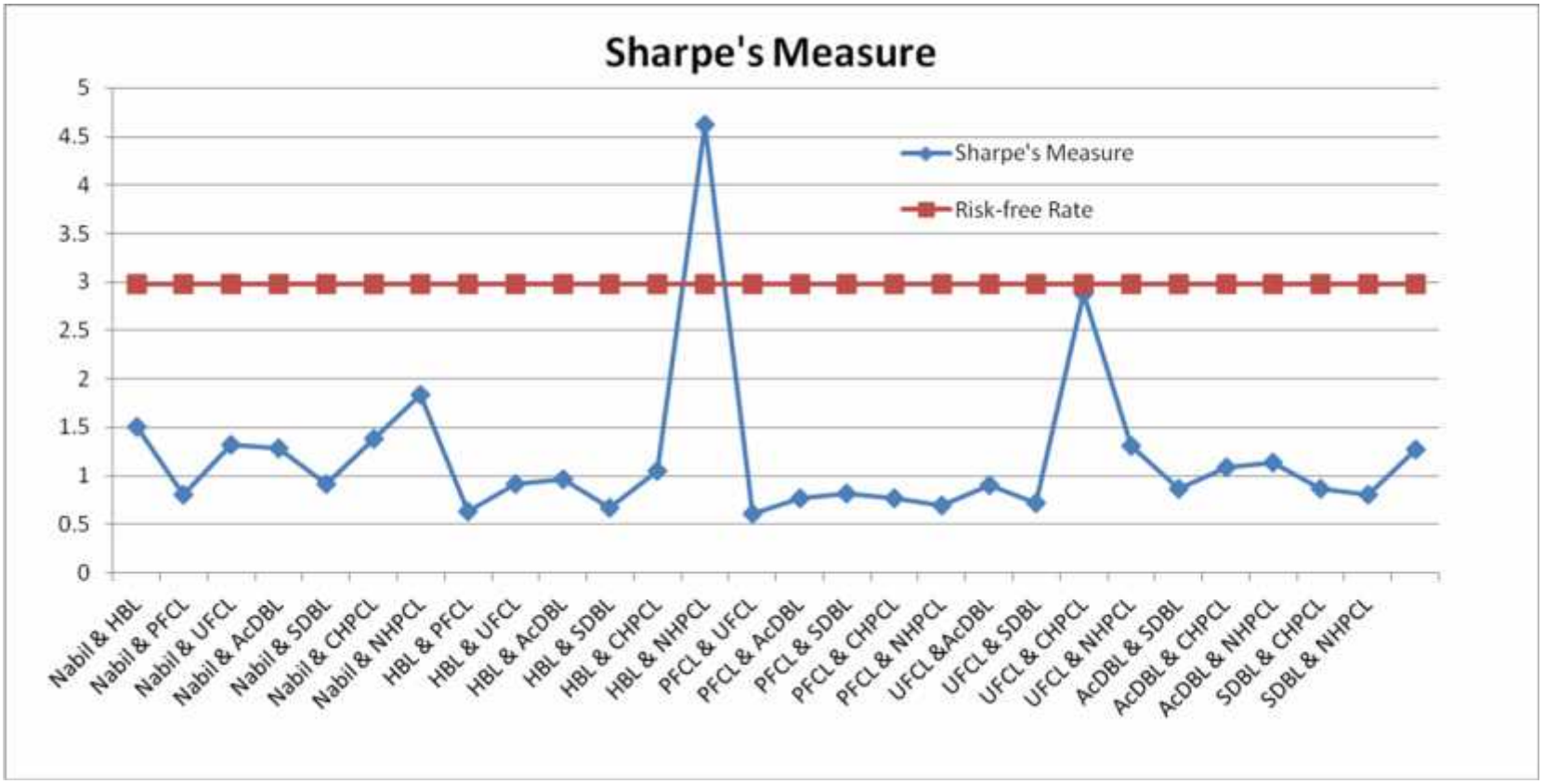
HBL and NHPCL	58.426%	12.65	4.62	1
PFCL and UFCL	55.936%	91.02	0.61	28
PFCL and AcDBL	72.596%	94.78	0.77	22
PFCL and SVBL	99.506%	121.44	0.82	19
PFCL and CHPCL	71.606%	93.05	0.77	23
PFCL and NHPCL	61.996%	88.78	0.70	25
UFCL andAcDBL	33.146%	36.89	0.90	16
UFCL and SVBL	60.056%	83.97	0.72	24
UFCL and CHPCL	95.066%	32.98	2.88	2
UFCL and NHPCL	22.526%	17.22	1.31	7
AcDBL and SVBL	76.716%	89.30	0.86	17
AcDBL and CHPCL	48.706%	44.38	1.09	11
AcDBL and NHPCL	39.206%	34.43	1.14	10
SVBL and CHPCL	75.616%	87.49	0.86	18
SVBL and NHPCL	66.116%	82.91	0.80	21
CHPCL and NHPCL	38.106%	30.11	1.27	9
Here, $\overline{rf}$=2.974%				

Source: Annex-II and III

From the Sharpe's measure, it is found that the portfolio between the shares of HBL and NHPCL brings the highest return. The return as per Sharpe's

measure for the portfolio of HBL and NHPCL is seen 4.62. The least return from the portfolio between the shares of PFCL and UFCL. The least return as per Sharpe's measure for the portfolio of these two finance companies is seen 0.61. The Sharpe's measures reward-to-variability ratio.

Figure No.4.1.


Sharpe's Measure
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Sharpe's Measure
Risk-free Rate
Nabil & HBL
Nabil & PFCL
Nabil & UFCL
Nabil & AcDBL
Nabil & SDBL
Nabil & CHPCL
Nabil & NHPCL
HBL & PFCL
HBL & UFCL
HBL & AcDBL
HBL & SDBL
HBL & CHPCL
HBL & NHPCL
PFCL & UFCL
PFCL & AcDBL
PFCL & SDBL
PFCL & CHPCL
PFCL & NHPCL
UFCL &AcDBL
UFCL & SDBL
UFCL & CHPCL
UFCL & NHPCL
AcDBL & SDBL
AcDBL & CHPCL
AcDBL & NHPCL
SDBL & CHPCL
SDBL & NHPCL

4.2. Treynor's Measure:

Treynor Index measures the risk premium of the portfolio, where risk premium equals the difference between the return of the portfolio and the riskless rate. This risk premium is related to the amount of systematic risk assumed in the portfolio. So, the Treynor index sums up the risk and return of a portfolio in a single number, while categorizing the performance of the portfolio. $T_n = \frac{\overline{r_n} - r^*}{\beta_n}$ Where;T_n= Treynor Index,$\overline{r_n}$ = Average Return on portfolio n, r^*= Riskless rate of interest and β_n = Beta coefficient of portfolio n.

Table : 4.2.

Treynor's Measure

Portfolio	$\overline{r_p} - \overline{r_f}$	β_p	T_n	**Rank**
Nabil and HBL	33.626%	0.0075	4483.47	21
Nabil and PFCL	72.646%	0.00435	16700.23	4
Nabil and UFCL	33.196%	0.008	4149.5	23
Nabil and AcDBL	49.856%	0.008	6232	16
Nabil and SVBL	76.766%	0.0115	6675.30	13
Nabil and CHPCL	48.756%	0.013	3750.46	25
Nabil and NHPCL	39.256%	0.00455	8628.69	9
HBL and PFCL	56.366%	0.00285	19777.54	2
HBL and UFCL	16.916%	0.0065	2602.46	27
HBL and AcDBL	33.576%	0.0065	5165.54	18
HBL and SVBL	55.406%	0.01	5540.6	17
HBL and CHPCL	32.476%	0.0115	2824	26

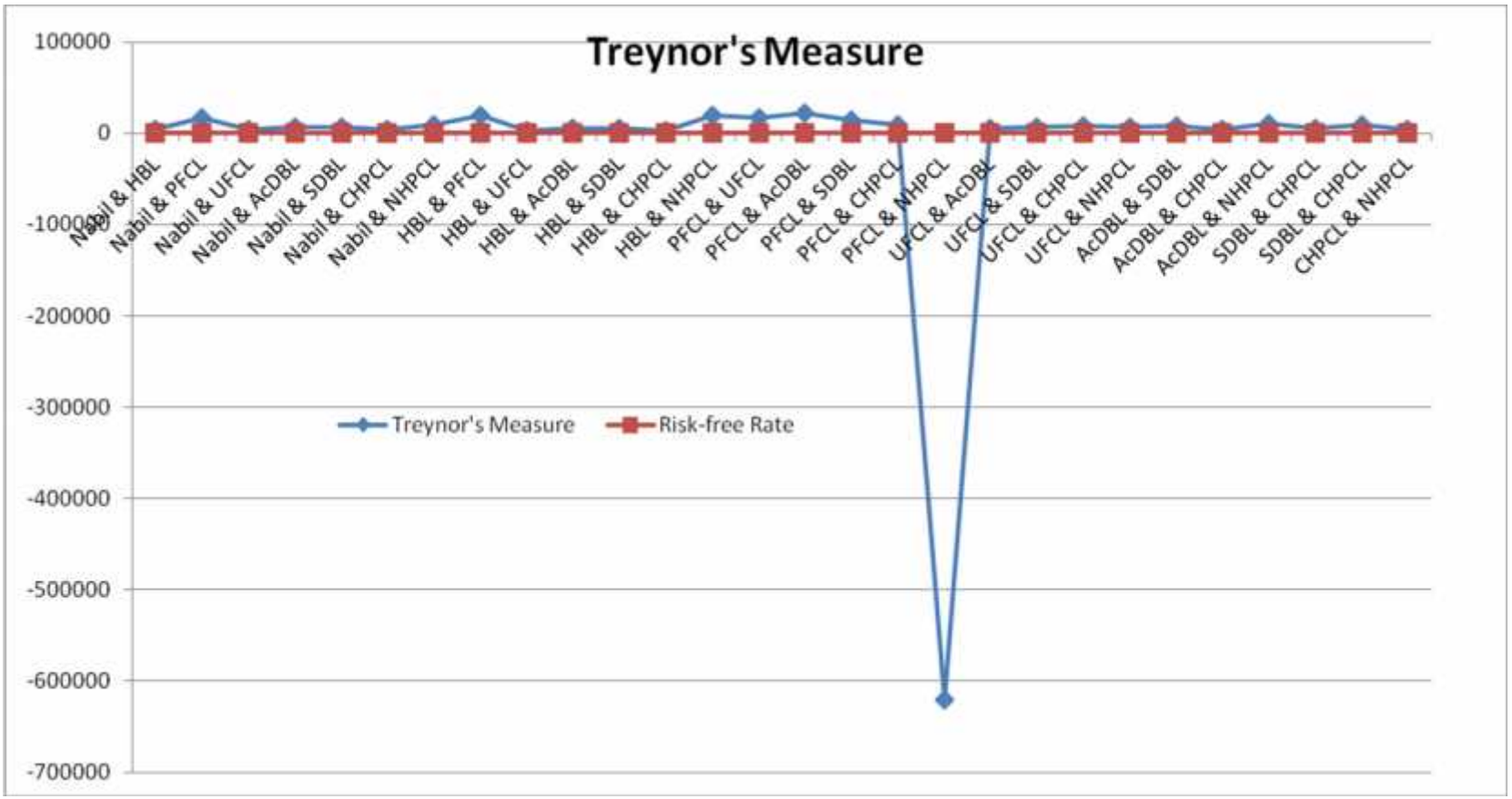
HBL and NHPCL	58.426%	0.00305	19156.07	3
PFCL and UFCL	55.936%	0.00335	16697.31	5
PFCL and AcDBL	72.596%	0.00335	21670.45	1
PFCL and SVBL	99.506%	0.00685	14526.42	6
PFCL and CHPCL	71.606%	0.00835	8575.57	10
UFCL and SVBL	60.056%	0.0105	6291.05	15
UFCL and CHPCL	95.066%	0.012	7922.17	11
UFCL and NHPCL	22.526%	0.00355	6345.35	14
AcDBL and SVBL	76.716%	0.0105	7306.29	12
AcDBL and CHPCL	48.706%	0.012	4058.83	24
AcDBL and NHPCL	39.206%	0.00355	11043.94	7
SVBL and CHPCL	75.616%	0.0155	4878.45	19
SVBL and CHPCL	66.116%	0.00705	9378.16	8
CHPCL and NHPCL	38.106%	0.00855	4456.84	22
Here, $\overline{r_f}$ =2.974%				

Source: Annex-II and IV

As per the Treynor's measure, the portfolio of PFCL and AcDBL brings the highest return and the portfolio between the PFCL and NHPCL shares gives the least return to an investor. The portfolios of PFCL with the other sample development banks are also seen productive under the Treynor's measure ranking.

As per the Treynor's measure, the portfolio among the other companies and the share of Nabil and HBL is seen not so productive. The highest unproductive with the negative return was seen from the portfolio of shares of PFCL and NHPCL.

Figure No.4.2.


Treynor's Measure
100000
0
-100000
-200000
-300000
-400000
-500000
-600000
-700000
Nabil & HBL
Nabil & PFCL
Nabil & UFCL
Nabil & AcDBL
Nabil & SDBL
Nabil & CHPCL
Nabil & NHPCL
HBL & PFCL
HBL & UFCL
HBL & AcDBL
HBL & SDBL
HBL & CHPCL
HBL & NHPCL
PFCL & UFCL
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UFCL & CHPCL
UFCL & NHPCL
AcDBL & SDBL
AcDBL & CHPCL
AcDBL & NHPCL
SDBL & CHPCL
SDBL & CHPCL
CHPCL & NHPCL
Treynor's Measure
Risk-free Rate

4.3. Jensen's Measure:

Jensen attempts to construct a measure of absolute performance on a risk-adjusted basis- that is, a definite standard against which performance of various funds can be measured. This standard is based on measuring the "portfolio manager's predictive ability- that is, his ability to earn returns through successful prediction of security prices which are higher than those which we would expect given the level of riskiness of his portfolio. A simplified version of Jensen's basic model is given by:

$$\bar{R}_{jt} - R_{Ft} = \alpha_j + \beta_j (\bar{R}_{Mt} - R_{Ft})$$

Where; $\bar{R}_{jt}$ = Average return on Portfolio j for period t, R_{Ft} = Riskless Rate of interest for period t, α_j = Intercept that measures the forecasting ability of the portfolio manager, β_j = A measure of systematic risk and $\bar{R}_{Mt}$ = Average return of a market portfolio for period t.

Table No.: 4.3.

Jensen's Measure

Portfolio	$\overline{r_p} - \overline{r_f}$	β_p	$\alpha_p((R)\bar{}jt)$	$\bar{R}_{jt}$/â	Rank
Nabil and HBL	33.626%	0.0075	33.87%	4515.54	21
Nabil and PFCL	72.646%	0.00435	72.79%	16732.31	4
Nabil and UFCL	33.196%	0.008	33.45%	4181.58	23
Nabil and AcDBL	49.856%	0.008	50.11%	6264.08	15
Nabil and SVBL	76.766%	0.0115	77.13%	6707.38	13
Nabil and CHPCL	48.756%	0.013	49.17%	3782.54	25
Nabil and NHPCL	39.256%	0.00455	39.40%	8659.77	9

HBL and PFCL	56.366%	0.00285	56.46%	19809.62	2
HBL and UFCL	16.916%	0.0065	17.12%	2634.54	27
HBL and AcDBL	33.576%	0.0065	33.78%	5197.61	18
HBL and SVBL	55.406%	0.01	55.73%	5572.68	17
HBL and CHPCL	32.476%	0.0115	32.84%	2856.08	26
HBL and NHPCL	58.426%	0.00305	58.52%	19188.14	3
PFCL and UFCL	55.936%	0.00335	56.04%	16729.39	5
PFCL and AcDBL	72.596%	0.00335	72.70%	21702.52	1
PFCL and SVBL	99.506%	0.00685	99.73%	14558.50	6
PFCL and CHPCL	71.606%	0.00835	71.87%	8607.64	10
PFCL and NHPCL	61.996%	-0.0001	61.99%	-619927.92	28
UFCL andAcDBL	33.146%	0.007	33.37%	4767.22	20
UFCL and SVBL	60.056%	0.0105	60.39%	5751.70	16
UFCL and CHPCL	95.066%	0.012	95.45%	7954.24	11
UFCL and NHPCL	22.526%	0.00355	22.64%	6377.43	14
AcDBL and SVBL	76.716%	0.0105	77.05%	7338.36	12
AcDBL andCHPCL	48.706%	0.012	49.09%	4090.91	24
AcDBL and NHPCL	39.206%	0.00355	39.32%	11076.02	7
SVBL and CHPCL	75.616%	0.0155	76.11%	4910.53	19
SVBL and NHPCL	66.116%	0.00705	66.34%	9410.23	8
CHPCL and HPCL	38.106%	0.00855	38.38%	4488.92	22
Here, $\overline{r_f} = 2.974\%, \overline{r_m} - \overline{r_f}$ ***=32.076%(Source: Annex-I)***					

Source: Annex II and IV

Jensen's measure is based on the CAPM model of the return of the portfolio. The risk-free rate of return is considered under this measure. For this purpose, the annualized average rate of 91 days T-bills has taken.

It attempts to construct a measure of absolute performance on a risk-adjusted basis. The difference among the Jensen's model and Shapre's and Treynor's measure is that both the earlier models' intercept of the line is at the origin whereas; the intercept of the Jensen's model can be at any point.

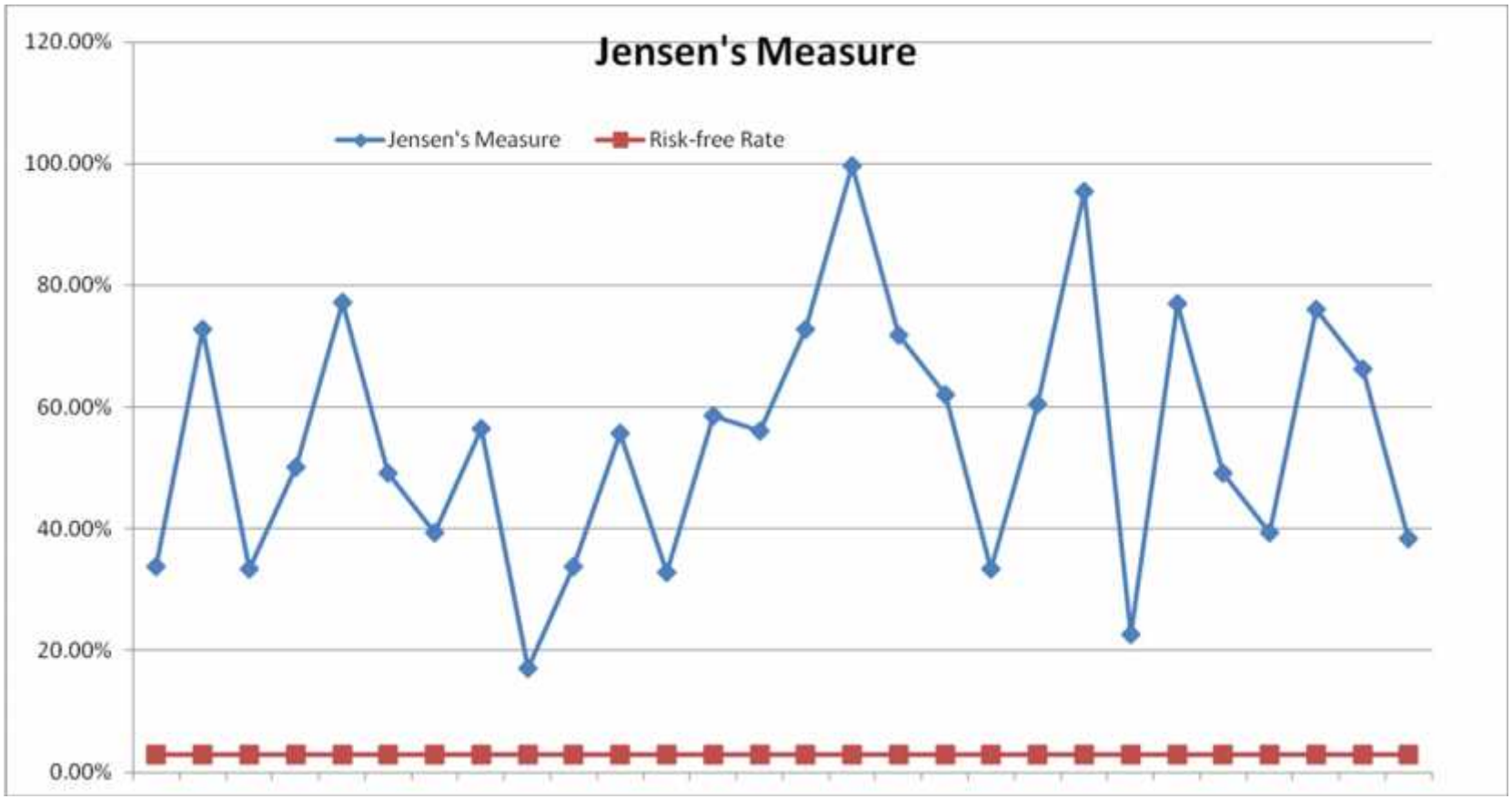
According to the Jensen's measure, α_p being the positive value shows the superior performance of the portfolio whereas, the negative value of the α_p shows the inferior performance of the portfolio as well as their management. The α_p equal to zero indicates the neutral performance.

But to get the actual ranking of the portfolio, the value of α_p has to be divided by the systematic risk. From the ranking of the portfolio, the portfolio with the share of PFCL in the Nepalese stock market will be the most productive as well as the most unproductive return as per the Jensen's measure.

As per alpha analysis, the portfolio of the commercial banks and the finance companies were also seen inferior comparatively. The highest return was seen from the portfolio between the shares of PFCL and

AcDBL and the least return was seen from the portfolio between the shares of PFCL and NHPCL.

Figure No.4.3.


Jensen's Measure
Jensen's Measure
Risk-free Rate
120.00%
100.00%
80.00%
60.00%
40.00%
20.00%
0.00%

4.4. Information Ratio:

It measures abnormal return per unit of risk that in principle could be diversified away by holding a market index portfolio. The information ratio or appraisal ratio is used as: Information Ratio=$\frac{\alpha_p}{\sigma(e_p)}$×100

Table : 4.4.

Information Ratio

Portfolio	$\alpha_p((R)\bar{}_{jt})$	σ_p	α_p/σ_p **×100**	**Rank**
Nabil and HBL	33.87%	22.23	152.36%	4
Nabil and PFCL	72.79%	90.46	80.47%	20
Nabil and UFCL	33.45%	25.20	132.74%	6
Nabil and AcDBL	50.11%	38.91	128.78%	8
Nabil and SVBL	77.13%	84.77	90.99%	15
Nabil and CHPCL	49.17%	35.36	139.06%	5
Nabil and NHPCL	39.40%	21.32	184.80%	3
HBL and PFCL	56.46%	88.90	63.51%	27
HBL and UFCL	17.12%	18.34	93.35%	14
HBL and AcDBL	33.78%	34.95	96.65%	13
HBL and SVBL	55.73%	83.08	67.08%	26
HBL and CHPCL	32.84%	30.82	106.55%	12
HBL and NHPCL	58.52%	12.65	462.61%	1
PFCL and UFCL	56.04%	91.02	61.57%	28
PFCL and AcDBL	72.70%	94.78	76.70%	23
PFCL and SVBL	99.73%	121.44	82.12%	19
PFCL and CHPCL	71.87%	93.05	77.24%	22

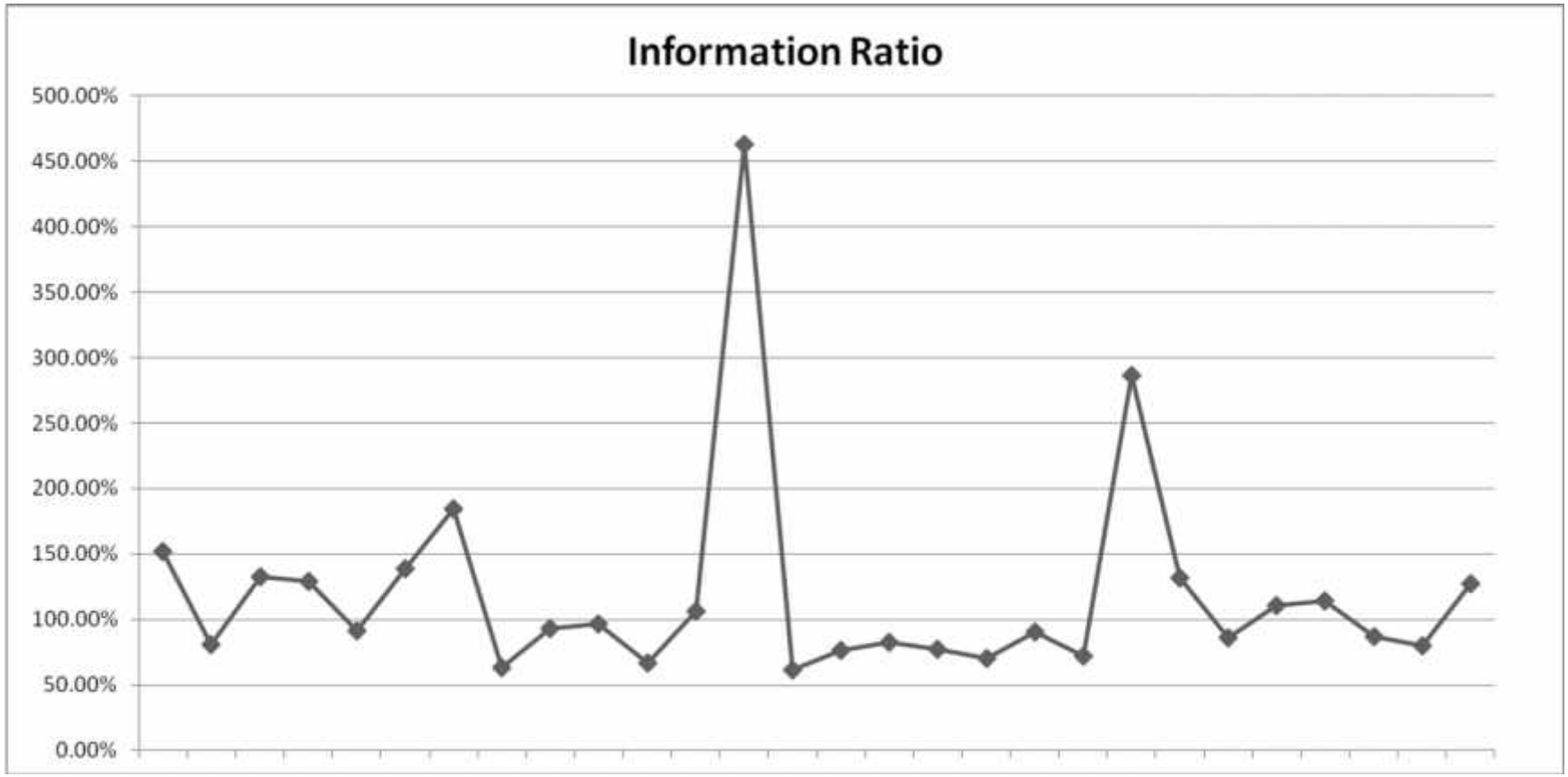
PFCL and NHPCL	61.99%	88.78	69.82%	25
UFCL andAcDBL	33.37%	36.89	90.46%	16
UFCL and SVBL	60.39%	83.97	71.92%	24
UFCL and CHPCL	95.45%	32.98	286.39%	2
UFCL and NHPCL	22.64%	17.22	131.48%	7
AcDBL and SVBL	77.05%	89.30	86.28%	18
AcDBL and CHPCL	49.09%	44.38	110.61%	11
AcDBL and NHPCL	39.32%	34.43	114.20%	10
SVBL and CHPCL	76.11%	87.49	86.99%	17
SVBL and NHPCL	66.34%	82.91	80.01%	21
CHPL and NHPCL	38.38%	30.11	127.47%	9

Source: Annex-III and Table No.4.3

Information ratio measures abnormal return per unit of risk that in principle could be diversified away by holding a market index portfolio. If an investor is a risk averter, he/she surely wants to escape from the risk exposure from the per rupee investment and expected for the good amount of return. Thus, for this purpose, the diversification of the portfolio is one of the options to secure from the loss from investment.

As per information ratio, the highest abnormal return per unit of risk is seen for the portfolio of HBL and NHPCL. And the least abnormal return per unit is seen for the portfolio of PFCL and UFCL. Similarly, the ranking as per the information ratio is seen random for the created portfolios.

Figure No.4.4.


Information Ratio
500.00%
450.00%
400.00%
350.00%
300.00%
250.00%
200.00%
150.00%
100.00%
50.00%
0.00%

4.5. M-Squared:

It measures the return an investor would have earned if the portfolio has been altered by use of the risk-free rate through borrowing or lending in order to match the market portfolio's risk level as measured by standard deviation. $M_p^2 = \overline{r_f} + SR_p\sigma_m$ Where, $\overline{r_f}$ =Risk-free Rate, SR_p= Sharpe Measure and σ_m = Standard Deviation of Market.

Table : 4.5.

M-Squared

Portfolio	$\overline{r_f}$	σ_m	S_t	M_p^2	**Rank**
Nabil and HBL	2.974%	26.63	1.51	43.1853%	25
Nabil and PFCL	2.974%	26.63	0.80	24.278%	8
Nabil and UFCL	2.974%	26.63	1.32	38.1256%	23
Nabil and AcDBL	2.974%	26.63	1.28	37.0604%	21
Nabil and SVBL	2.974%	26.63	0.91	27.2073%	14
Nabil and CHCL	2.974%	26.63	1.38	39.7234%	24
Nabil and NHPCL	2.974%	26.63	1.84	51.9732%	26
HBL and PFCL	2.974%	26.63	0.63	19.7509%	2
HBL and UFCL	2.974%	26.63	0.92	27.4736%	15
HBL and AcDBL	2.974%	26.63	0.96	28.5388%	16
HBL and SVBL	2.974%	26.63	0.67	20.8161%	3
HBL and CHPCL	2.974%	26.63	1.05	30.9355%	17
HBL and NHPCL	2.974%	26.63	4.62	126.0046%	28
PFCL and UFCL	2.974%	26.63	0.61	19.2183%	1
PFCL and AcDBL	2.974%	26.63	0.77	23.4791%	6
PFCL and SVBL	2.974%	26.63	0.82	24.8106%	10
PFCL and CHPCL	2.974%	26.63	0.77	23.4791%	7
PFCL and NHPCL	2.974%	26.63	0.70	21.615%	4
UFCL andAcDBL	2.974%	26.63	0.90	26.941%	13
UFCL and SVBL	2.974%	26.63	0.72	22.1476%	5

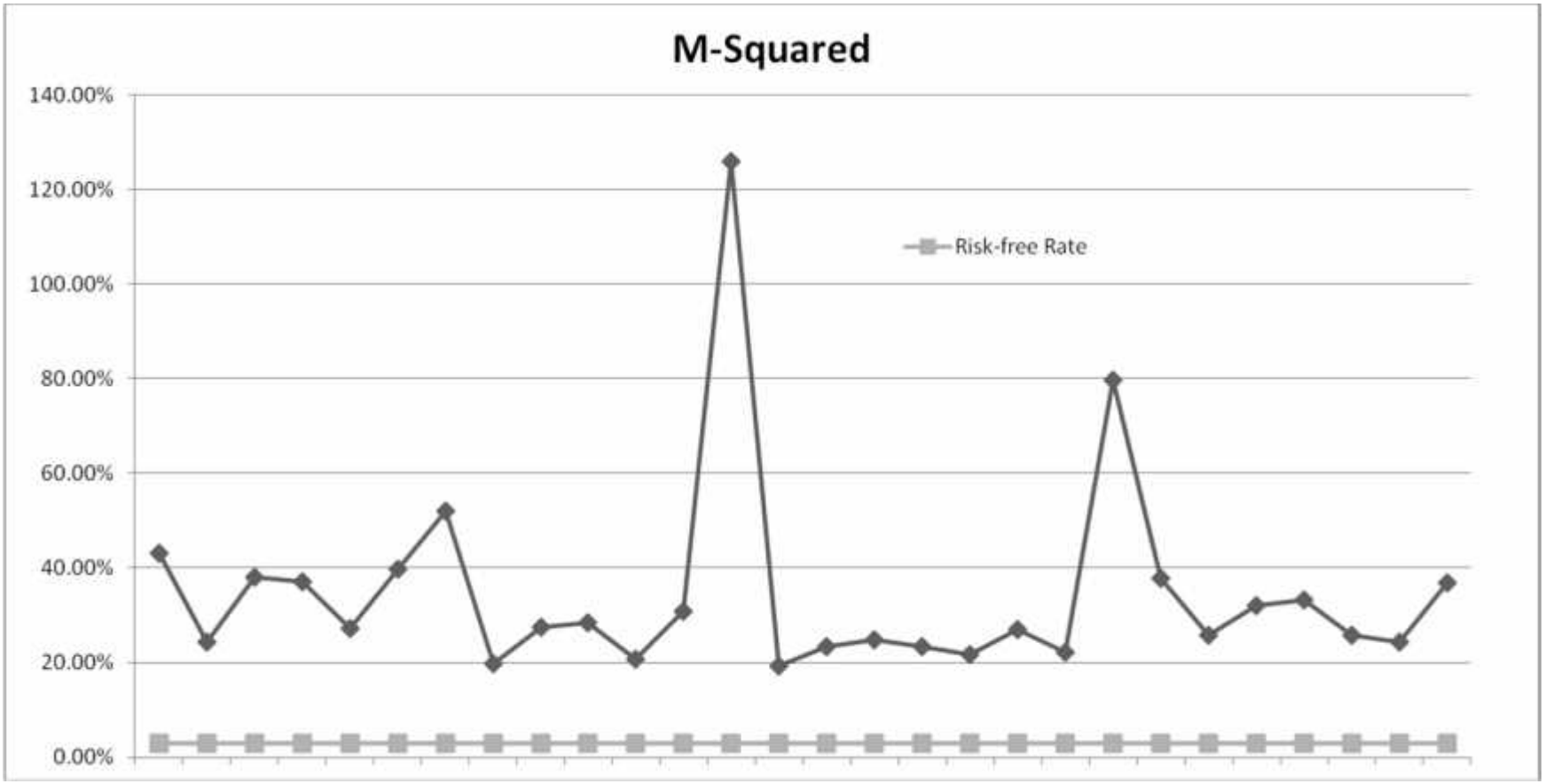
UFCL and CHPCL	2.974%	26.63	2.88	79.6684%	27
UFCL and NHPCL	2.974%	26.63	1.31	37.8593%	22
AcDBL and SVBL	2.974%	26.63	0.86	25.8758%	11
AcDBL and CHPCL	2.974%	26.63	1.09	32.0007%	18
AcDBL and NHPCL	2.974%	26.63	1.14	33.3322%	19
SVBL and CHPCL	2.974%	26.63	0.86	25.8758%	12
SVBL and NHPCL	2.974%	26.63	0.80	24.278%	9
CHPCL and NHPCL	2.974%	26.63	1.27	36.7941%	20

Source: Annex-I and Table No.4.1

Like the Sharpe ratio, the M^2 measure focuses on total volatility as a measure of risk, but its risk-adjusted measure of performance has the easy interpretation of a differential return relative to the benchmark index.

The portfolio with the shares of Nabil Bank and other companies' shares brings out the higher volatile portfolio combination as per M^2 measure. The volatile portfolio in Nepalese stock market is created with the shares of the commercial banks and development banks as well. The least volatile portfolio created is from the shares of PFCL and UFCL with M^2 of 19.2183%.

Figure No.4.5.


M-Squared
140.00%
120.00%
100.00%
80.00%
60.00%
40.00%
20.00%
0.00%
Risk-free Rate

4.6. Measure of Coefficient of Variance:

If risk is measured by the standard deviation, then risk per unit of expected return can be measured by the coefficient of variation (C.V.). The larger the C.V the larger the relative risk of the investment. Coefficient of Variation (C.V.) = $\frac{\pm}{E(r)}$ Where, σ = Standard deviation and E(r) = Expected rate of return.

Table : 4.6.

Measure of Coefficient of Variation

Portfolio	$\overline{r_p}$	σ_p	$\sigma_p / \overline{r_p} \times 100$	**Rank**
Nabil and HBL	36.60%	22.23	60.74%	4
Nabil and PFCL	75.62%	90.46	119.62%	20
Nabil and UFCL	36.17%	25.20	69.67%	7
Nabil and AcDBL	52.83%	38.91	73.65%	9
Nabil and SVBL	79.74%	84.77	106.31%	16
Nabil and CHPCL	51.73%	35.36	68.35%	6
Nabil and NHPCL	42.23%	21.32	50.49%	3
HBL and PFCL	59.34%	88.90	149.81%	27
HBL and UFCL	19.89%	18.34	92.21%	13
HBL and AcDBL	36.55%	34.95	95.62%	14
HBL and SVBL	58.38%	83.08	142.31%	26
HBL and CHPCL	35.45%	30.82	86.94%	12
HBL and NHPCL	61.40%	12.65	20.60%	1
PFCL and UFCL	58.91%	91.02	154.51%	28
PFCL and AcDBL	75.57%	94.78	125.42%	23

PFCL and SVBL	102.48%	121.44	118.50%	19
PFCL and CHCL	74.58%	93.05	124.77%	22
PFCL and NHPCL	64.97%	88.78	136.65%	25
UFCL andAcDBL	36.12%	36.89	102.13%	15
UFCL and SVBL	63.03%	83.97	133.22%	24
UFCL and CHPCL	98.04%	32.98	33.64%	2
UFCL and NHPCL	25.50%	17.22	67.53%	5
AcDB and SVBL	79.69%	89.30	112.06%	18
AcDB and CHPCL	51.68%	44.38	85.87%	11
AcDB and NHPCL	42.18%	34.43	81.63%	10
SVBL and CHPCL	78.59%	87.49	111.32%	17
SVBL and NHPCL	69.09%	82.91	120.00%	21
CHPCL and NHPCL	41.08%	30.11	73.30%	8

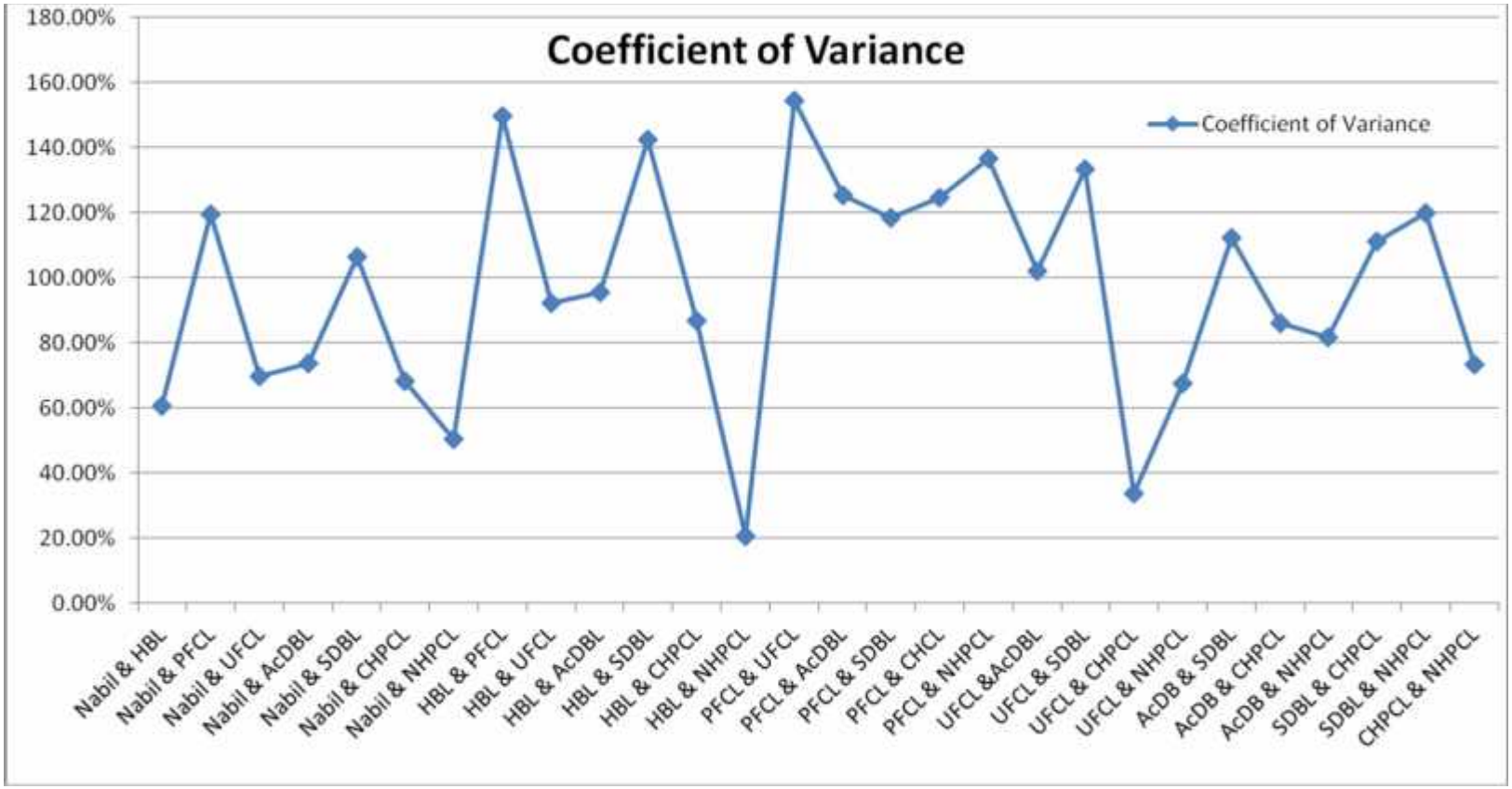
Source: Annex-II and Annex-III

According to CV analysis, lesser the value of CV, more consistent in the return on the portfolio and vice-versa. The return from the portfolio of shares of HBL and NHPCL in the Nepalese stock market is seen the most consistent as per the CV analysis.

The most inconsistent return from the portfolio in the Nepalese stock market is from PFCL and UFCL with the CV of 154.51%. The portfolio created with the commercial banks can be seen beneficiary as the return are seen consistent with relatively lesser CV especially with the

shares of Nabil Bank. Similar, was seen for the portfolio with the hydropower companies.

Figure No.4.6.


Coefficient of Variance
Coefficient of Variance
180.00%
160.00%
140.00%
120.00%
100.00%
80.00%
60.00%
40.00%
20.00%
0.00%
Nabil & HBL
Nabil & PFCL
Nabil & UFCL
Nabil & AcDBL
Nabil & SDBL
Nabil & CHPCL
Nabil & NHPCL
HBL & PFCL
HBL & UFCL
HBL & AcDBL
HBL & SDBL
HBL & CHPCL
HBL & NHPCL
PFCL & UFCL
PFCL & AcDBL
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UFCL & CHPCL
UFCL & NHPCL
AcDB & SDBL
AcDB & CHPCL
AcDB & NHPCL
SDBL & CHPCL
SDBL & NHPCL
CHPCL & NHPCL

4.7. Test of Hypotheses:

4.7.1. Test of Hypothesis on Correlation in the Ranked Data of Sharpe's Measure and Jensen's Measure:

Null Hypothesis, (H_o): ρ_s=0: There is no correlation in the ranked data of Sharpe's Measure and Jensen's Measure.

Alternative Hypothesis, (H_o): $\rho_s \neq 0$: There is correlation in the ranked data of Sharpe's Measure and Jensen's Measure.

Decision: Since, the calculated value of 'z' is lesser than tabulated value of 'z' for two-tailed-test, the null hypothesis, H_0 is accepted. Hence, there is no correlation in the ranked data of Sharpe's Measure and Jensen's Measure. ***(Source: Annex-V)***

4.7.2. Test of Hypothesis on Correlation in the Ranked Data of Sharpe's Measure and Treynor's Measure:

Null Hypothesis, (H_o): ρ_s=0: There is no correlation in the ranked data of Sharpe's Measure and Treynor's Measure.

Alternative Hypothesis, (H_o): $\rho_s \neq 0$: There is correlation in the ranked data of Sharpe's Measure and Treynor's Measure.

Decision: Since, the calculated value of 'z' is lesser than tabulated value of 'z' for two-tailed-test, the null hypothesis, H_0 is accepted.

Hence, there is no correlation in the ranked data of Sharpe's Measure and Treynor's Measure. ***(****Source: Annex-VI****)***

4.7.3. Test of Hypothesis on Correlation in the Ranked Data of Jensen's Measure and Treynor's Measure:

Null Hypothesis, (H_o): ρ_s=0: There is no correlation in the ranked data of Jensen's Measure and Treynor's Measure.

Alternative Hypothesis, (H_o): $\rho_s \neq 0$: There is correlation in the ranked data of Jensen's Measure and Treynor's Measure.

Decision: Since, the calculated value of 'z' is greater than tabulated value of 'z' for two-tailed-test, the null hypothesis, H_0 is rejected. Hence, there is correlation in the ranked data of Jensen's Measure and Treynor's Measure. *(Source: Annex-VII)*

4.8. Major Findings:

The major findings of the study are as follows:

1. From the Sharpe's measure, it is found that the portfolio between the shares of HBL and NHPCL brings the highest return and least of PFCL and UFCL.

2. As per the Treynor's measure, the portfolio between the AcDBL and PFCL is seen productive. The highest unproductive with the negative return was seen from the portfolio of shares of PFCL and NHPCL.
3. As per the Jensen's measure, the highest return was seen from the portfolio between the shares of PFCL and AcDBL and the least

return was seen from the portfolio between the shares of PFCL and NHPCL.

4. As per information ratio, the highest abnormal return per unit of risk is seen for the portfolio of HBL and NHPCL. And the least abnormal return per unit is seen for the portfolio of PFCL and UFCL.
5. The portfolio with the shares of Nabil Bank and other companies' shares brings out the higher volatile portfolio combination as per M^2 measure. The least volatile portfolio created is from the shares of PFCL and UFCL with M^2 of 19.2183%.
6. The most consistent was seen for the portfolio between the shares of HBL and NHPCL but inconsistent return from the portfolio in the Nepalese stock market is from PFCL and UFCL with the CV of 154.51%.
7. There is no correlation in the ranked data of Sharpe's Measure and Jensen's Measure.
8. There is no correlation in the ranked data of Sharpe's Measure and Treynor's Measure.
9. There is correlation in the ranked data of Jensen's Measure and Treynor's Measure.

CHAPTER- V

SUMMARY, CONCLUIONS AND RECOMMENDATIONS

5.1. Summary:

Return is fundamental requirement of investment and a certain level of risk is attached with it. Saving is worthless until and unless used in productive investment. Finance mostly deals with the monetary risk and return which is the most influencing subject matter for an individual and to small and large corporations as well. Past trend shows that the field of finance is gradually improving and it has truly undergone a revolution and it is one of the leading sectors. Stock market has become a global phenomenon.

Generally, investors invest their current cash only to those areas where these is high return and low risk. And investor looking for the common stock investment usually pays the price for stock based on his estimation about future dividends and grown in stock price. This study occupies an important role in the development of stock market.

Lack of information and lean knowledge is chief problem faced by individual investor who are manipulated and exploited by the financial institutions and there market intermediaries. The attitude and perception of investors play chief role in investment decision which is influenced by the information and access to the data required for analysis. Investors invest their wealth on the basis of guess and hunches because they do not have any information about the financial asses and they also lack the idea to reach to ideal investment decision. Investor purchase stocks merely looking past trend of stock prices and sometimes they have to bear heavy loss due to

inadequate knowledge and information related to the stock investment. One expects favorable returns by holding stock. How can one make higher return assuming lower risk?

Since the main objective of the study is to analyze the risk and return of common stocks and optimum portfolio measurement of Nepalese Stock Market in Nepalese context. The study is mainly focused on the performance measure of the portfolio created from the eight of the listed companies in Nepse. For the study purposes, the performance level of 28 portfolios has been done using various risk-adjusted measures.

5.2. Conclusion:

Calculating average portfolio returns does not mean the task is done. Returns must be adjusted for risk before they can be compared meaningfully. The simplest and most popular way to adjust returns for portfolio risk is to compare rates of return with those of other investment funds with similar risk characteristics, for example, high-yield bond portfolios are grouped into one “universe”, growth stock equity funds are grouped into another universe, and so on. Risk is measured using the standard deviation, and then the risk per unit of expected return is measure using C.V. Then the conventional theory of performance evaluation came to exist in the portfolio risk-adjusted performance measures. Under this, using mean-variance criteria came on stage simultaneously with the CAPM.

As, it types or methods of risk-adjusted performance measures of portfolio give emphasis for the particular variable, the ranking of the portfolio also varied according to the types of measures. According to the Sharpe’ measure, the portfolio between the shares of HBL and NHPCL brings the

highest return and least of PFCL and UFCL. As per the Treynor's measure, the portfolio between the AcDBL and PFCL is seen productive. The highest unproductive with the negative return was seen from the portfolio of shares of PFCL and NHPCL.As per the Jensen's measure, the highest return was seen from the portfolio between the shares of PFCL and AcDBL and the least return was seen from the portfolio between the shares of PFCL and NHPCL.

As per information ratio, the highest abnormal return per unit of risk is seen for the portfolio of HBL and NHPCL. And the least abnormal return per unit is seen for the portfolio of PFCL and UFCL.

The measure of M-squared uses standard deviation as the relevant measure of risk M-squared measure shows the higher volatile portfolio combination with the shares of Nabil Bank. The coefficient of variance measures the consistency of the portfolio. Thus, the study shows the return from the portfolio between the shares of HBL and NHPCL was seen the most consistent.

Under the test of hypotheses, there is no correlation in the ranked data of Sharpe's Measure and Jensen's Measure. Similarly, there is no correlation in the ranked data of Sharpe's Measure and Treynor's Measure. But, it was concluded that there is correlation in the ranked data of Jensen's Measure and Treynor's Measure.

5.3. Recommendations:

1. One of the most important recommendations for the investors as per portfolios creation is: "Don't put all the eggs in one basket."

2. Think and review the market trend and the stock price movement before creating the portfolio.

3. Do the risk and return analysis before making the portfolio of any sectors stocks.

4. Try to implement the risk-adjusted measures as far as feasible in the process of making your portfolios.

5. To assess profitable investment, it is better to measure the coefficient of variation because C.V. is a measure of relative dispersion (risk), a measure of risk per unit of expected return and more useful than absolute one i.e. standard deviation of a give security.

6. Do not run after the rumors and hearsay regarding the stock market while making an investment.

7. To get the abnormal profit from the portfolio created, sometime the investors should also follow against the general theory and principle of the stock market.