CHAPTER – I

INTRODUCTION

1.1 Background of the Study

The current state of Nepalese economy is characterized by unutilized natural resources, miserable agriculture, deficit trade, mass poverty, illiteracy, and so forth. Agriculture is the main occupation of almost village people but they have not yet implemented scientific methods of agriculture. The natural resources available here have been remained unutilized due to various reasons. However, it is regarded as one of the richest countries in the world in terms of natural resources. The economic inequality remains high in the nation. Frequent changes in government and even the worsened security situation at present have obstructed the realization of policy reforms and delayed the implementation of development works. While the country has been moving towards market- friendly economy since the early 1990s.In globalization and liberalization environment of world, Nepal adopted open market policy, which attracts several multinational companies to invest in different sector. The open market concept creates several opportunity and threats. Rapid development in IT sector is also milestone for increasing investment activities. The liberalization policy attracts foreign investor as well as national investor, which help to raise the life standard of people.

Nepal has many implicit and explicit obstacles for every facets of the development. Investments in productive sectors are necessary for the economic development of any country. This increases economic activities, which finally accelerates economic growth. The unutilized financial resources should be divided towards productive sectors in order to increase the economic activities. Hence, sustained and balanced economic development of all sectors is possible.

Like blood is necessary for human beings, finance is for business organizations and industries. Each and every business organization should base their decision making in financial management. Financial management is mainly concerned with the acquisition and utilization of funds. Financial market plays vital role in utilizing financial resources for expanding productive sectors in the country. It mobilizes unproductive and unutilized

financial resources towards productive sectors and helps in expanding economic growth of a country.

Capital markets collect necessary funds and divert the collected funds towards the productive sectors. Capital market is a significant mechanism for the development of national economy. It reinvigorates and boosts up the economic activities by mobilizing especially domestic financial resources. It provides best investment opportunities by transaction of financial instruments.

Financial instruments are traded in securities market. Stock market is the largest financial market all over the world where stocks of various business organizations are traded. It has the greatest role in the development of financial system.

Steady and speedy development of the economy is only possible when competitive business and investment activity exist. Saving alone does nothing until it is converted into profitable investment. All kinds of business activities of the country depends on competitive business environment of the economy thus, business activities such as saving and investment provides resources for the development of whole industry of the economy. Investment is the sacrifices of existing resources to generate return in future involving risk.

All investment choices are made at the points of time in respect of personal investment ends and in contemplation of an uncertain future. Because and insofar as investment in securities are revocable as the investment ends of persons are transient and the environment is fluid, as the reliable bases for reasoned expectations become more and more vague as one conceives of the further distant future, investors in securities will from time to time reappraise and reevaluate their various investment commitments in the light of new information and (perhaps) changed expectations and ends.

Investment choices (decisions) are found to be outcomes of three different but related classes of factors. The first is factual or informational premises. The factual premises of investment decisions are provided by many streams of data which, taken together, represent to an investor the observable environment and the general and particular features of the

securities and firms in which he/she may invest. The second classes of factors entering into investment are as expectation premises.

Expectations relating to the outcomes of alternative investment are subjective and hypothetical in any case but their foundations are necessarily provided by the environmental and financial facts available to investors. These limit not only the range of investments, which may be undertaken, but also the expectations of outcomes that may legitimately be entertained. The third and final classes of factors are valuable premises.

For investors generally these comprise the structure of subjective preferences for the size and regularity of the income to be received from, and for the safety and negotiability of, specific investments or combinations of investments, as these are appraised from time to time. When the analysis passes from the stage of description to the higher stage of security selection his frame of reference widens. He now considers not only securities but security holders as well. In the formulation of a program for the acquisition and management of a security portfolio, the first and most basic step is to distinguish clearly between investment and speculation.

Investment decisions traditionally have been concerned primarily with uses of budgeting of money instead with locating the cheapest source of money. Elements of typical investment decisions are:

1. What should be the allocation between current consumption (e.g. dividend payout) and reinvestment (i.e., retained and reinvested earnings)?
2. What is the optimal rate of total investment (i.e., what should be the rate of increase in capacity for production or earnings)?
3. What specific assets should be purchased?
4. What, proportion of the total money available should be invested in each particular asset?
5. How often to evaluate the performance of the portfolio of assets?

Key to successful investment investing involves examination and analysis of three chronological segments of the business's operation – past performance, present condition and future prospects.

Adequate diversification means assortment of investment commitments in different ways. Those who are riot familiar with the aggressive – defensive approach nevertheless often carry out the theory of hedging against inflation – deflation. Vertical diversification occurs when securities of various companies engaged in different phases of production from raw material to finished goods are held in the portfolio.

On the other hand, horizontal diversification is the holding by an investor of various companies all of which carry an activity in the same stage of production. Another way to diversify securities is to classify them according to bonds and stocks and reclassify according to types of bonds and types of stocks. Again, they can also be classified according to the issuers, according to the dividend or invest income dates, according to the products which are made by the firms represented by the securities. An investment is a liquid asset if it can be converted into cash without delay at full market value in any quantity.

For an investment to be liquid it must be (1) reversible (2) marketable. The difference between reversible and marketability is that is the process whereby the transaction is reversed or terminated while marketability involves the sale of the investment in the market for cash. To meet emergencies, every investor must have a sound portfolio to be sure for the additional fund, which may be needed for the business opportunities. Whether money rising is to be done by sale or by borrowing it will be easier if the portfolio contains a planned proportion of high – grade and readily saleable investment.

Investment policy is also a form of long range strategic planning. It delineates the investor's specific goals and how the investor expects those goals to be realized. In this sense, investment policy comprises the set of guidelines and procedures that direct the long-term management of the investor's assets.

Majority of the securities available for investment have uncertain outflows and are thus risky. Investors thus always feel complicated to determine which particular risky securities to own. Source of risk can be diversified away by combining the asset with a portfolio of other assets. This reduction in total risk resulting from combining securities into a portfolio is called portfolio effect. In addition, same complication may be felt while selecting the optimal portfolio from a set of possible portfolios. Hence it is often referred to as the

portfolio selection problem. Harry M. Markowitz developed one solution to this problem in 1952.

Portfolio management is concerned with efficient management of portfolio investment in financial assets, including shares and debentures of companies. The management may be by professionals, by others or by individuals themselves. A portfolio of an individual or corporate unit is the holding of securities and investment in financial assets. These holding are the results of individual preferences and decisions regarding risk and return.

Feorge (1999) Portfolio management is the art of handling a pool of funds so that it not only preserves its original worth but also over time appreciates in value and yields an adequate return consistent with the level of risk assumed. The objective of portfolio management is to analyze different individual assets and delineate efficient portfolios.

The set of portfolios meeting requirement offering maximum return for varying level of risk and offering minimum risk for varying level of expected return is known as the efficient set. Portfolio is simply the concept of diversifying his/her wealth in two or more different securities. This will help to maintain risk and secure the optimal expected return. Risk and return analysis deals with diversification of risk to minimize risk. Portfolio is just the collection or set of several investment securities, which is generally used for minimizing risk and maximizing return. Portfolio is combination of investment in different periodic and return securities at once. The rational investor likely used portfolio set to minimize risk and maximize return. A portfolio simply represents the practice among the investors of having their funds in more than one asset. The combination of investment assets is called portfolio (Weston and Brigham, 1982: 45)

In any investment there exists certain level of risk and it is happened due to market and other factors. Therefore, the risk is categorized as systematic and unsystematic risk. Systematic or diversifiable risk can be eliminated or minimized through portfolio analysis while as unsystematic or non-diversifiable risk can't be minimized or eliminate. It must bear and investors should take defensive assets to reduce unsystematic risk.

The optimal portfolio having positive weights is desirable for investors. It will also lie on efficient frontier curve and the investor's utility curve make tangent in this point. It is most efficient point in which the investors get good outcome. After optimal portfolio is calculated, there is difficult to choose which set is desirable. The desirability of any portfolio is depended upon the preference of investors. Investors having high-risk aversion level move toward risk free assets. It provides low return but it has little amount of risk. We can segregate the optimal proportion to individuals on the basis of their risk.

1.2 Statement of the Problems

Investments are made for positive returns; however, abundances of risk factors may turn returns to negative. Thus, prior to investments in stocks, a sensitive study on the potential investment is required. Price of stocks is market sensitive. Nominal degree of signaling effect will be playing freely in stock market causing a high degree of fluctuation in the stock price. Therefore, market sometimes turns to bullish and sometimes to bearish. Speculative motive of an individual is thus affected by such market characteristics. Apart from this, the dividend policy of the bank including the bonus issue, rights issue and the stock split too affects the price of share.

Returns on the stock are the summation of dividend yield and capital gain yield. However, most of the investors do feel that the higher the value of stock, higher is profitable in the stock investment and vice-versa and dividend at that time is ignored. Thus to make a rational decision on the investment in the assets, its dividend yield should also be considered. Dividend yield is the collective return realized as cash and/or bonus shares.

On the other hand, investment practices of stock investors are very limited in Nepal. Lack of information and knowledge has been the main constraints. Therefore, the chances of being manipulated and exploited by the financial institution and market intermediaries are in its peak. Thus they tend to avoid the risk and are often reluctant to tie their savings into the long-term commitment. Moreover, common stock investment can be hazardous incase of insufficient knowledge of its behavior. In the mean time there are no separate institutions providing required information to make rational decision that can accelerate the stock investment and market efficiency. Government policy in this regard is found less encouraging.

Nepalese stock market has experienced a noticeable growth during last decade. However, the market has been confronted many difficulties. Even, investors have difficulties in choosing the best securities and create a well-diversified portfolio. They are misadvised by the brokers. They only see the market price when making investment. They do not analyze the risk factors associated with the return. In most cases, they have considered stock market as an important gambling place to make fortunes overnight without considering how such irrational behavior can put them possibly into greater loss.

Most investors use linear logic to formulate their investment strategies and make investment decisions. Linear logic is based in the assumption that the future will resemble the past in a highly predictable fashion. Assets having a greater probability of loss are felt as more risky than those with lesser chance of loss. Investment decisions based on research and study are always better than any investment based on gambling (Grewall, 1995).

The rapid expansion is quantum of fund raised, a number of investors in the primary market and increasing number of listed securities has speedily raised the market capitalization which is an indication of bright future of capital market of Nepal.

Optimal portfolio is the combination which provide the highest possible return for any specified degree of risk or the lowest possible risk for any specified rate of return and the fundamental aspect of portfolio theory is the idea that the risk inherent in any single asset held in a portfolio is different from the risk of that asset held in isolation. But this theory actually may not be applicable in the capital market like Nepal where the market is inefficient. In this respect the study deals with following issues.

- Is the Portfolio Management Minimizing the Organization's Losses?
- Is the Portfolio Management Maximization of the Organization's profit?
- Are share prices affected by Portfolio Management in sample banks?
- Is the sample banks guided by specific Portfolio Management?
- Do the sample banks have uniformity in Portfolio Management Ratio?
- Is there any consistency in used of Portfolio Management in the sampled banks?
- Does the Portfolio Management affects Return, Risk, sample banks?

This study will try to answer the above mentioned issues on the basis of major findings.

1.3 Objectives of the Study

The main objective of the study is to examine the portfolio management of sample listed companies i.e. NABIL Bank Ltd., ACE Development Bank Ltd., Bishal Bazaar Company Ltd. and Unilever Nepal Ltd**.** However the specific objectives are as follows:

- To evaluate common stock of sample stocks in terms of risk and return.
- To analyze systematic risk associated with common stock prices and identify the range for true beta and true alpha.
- To measure the relationships between stock returns with market return, and between the stocks of sample companies.
- To construct and evaluate portfolio opportunity sets at different weights of investment and identify optimal portfolio.
- To Recommendation on the basis of Data Analysis

1.4 Significance of the Study

This study is the practical fulfillment required for MBS programme. This study will be helpful to investors regarding the risk return statistics association with investment. The present study attempts to address upon the selection of the assets for the construction of portfolio. For better diversification, it is important to match the investment characteristics of various assets categories to the risk and return characteristics in efficient manner that could maximize return and minimize risk. Risk tolerance, return need, time horizon should also be analyzed which vary among different individuals. While allocating the assets for a portfolio, an investor should compare the relationship between the assets. Their realized return, expected return.

Should be taken into account and correlation between the securities provides the possibilities of eliminating some risk without reducing potential returns. Therefore, this study will be significant for other researcher in the area of investment as it provides suggestion to some extent.

Moreover, investment practices under the organized stock exchanges are heading progressively in Nepal. But very few studies and researches have been undertaken regarding

the stock market. Since we are moving towards the free and open market economy, such studies have become more significant. Due to growing number of investors- individual as well as corporate, such type of studies help them make rational investment decisions.

1.5 Limitation of the Study

The study is made for the partial fulfillment of Master in Business studies program of Tribhuwan University. So, it is not a comprehensive study and it focused to analyze certain aspects secondary data in Nepal. The result obtained from this study can not be generalized. Similarly the time and resources constraints are other limitation.

1.6 Organization of the Study

The study will be organized in to five chapters. Which are:-

Chapter-I: Introduction

This chapter is introductory and deals with background and preface 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 incorporates 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. In review the covered literature includes the definition of the insurance, its principles and premium calculation procedures.

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 adopted, 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, pie charts, etc. will be used accordingly. The statistical will be the different types of test of hypotheses. This chapter also includes major findings of the study.

Chapter-V: Summary, Conclusion and Recommendation

This chapter includes Summary, conclusion and recommendation further important.

Appendices and Bibliography are included at the end of the Chapter.

CHAPTER – II

LITERATURE REVIEW

This chapter reviews the literatures related to the portfolio management from various textbooks, journals and related studies. This chapter deals with theoretical aspects of risk and return characteristics of common stocks, portfolio management; diversification or asset allocation concepts etc. For this, some relevant books, journals, magazines, newspapers, websites and so on related to financial management and other related studies have been renewed. Apart from this various masters degree thesis including independent studies carried out by renowned experts and others are also reviewed.

2.1 Concept Framework

Conceptual review or theoretical review deals with the theoretical aspects of investment, return, risk, portfolio, diversification, different models and methods of stock pricing etc.

2.1.1 Investment

Sharpe et al (2003) define the investment as sacrifice of current dollars for future dollars. They have attributed the involvement of time and risk during investment. Sacrifice takes place in the present and is certain. The reward comes later, if at all, and the magnitude is generally uncertain. Shrestha et al (2002) write investment as utilization of saving for something that is expected to produce profit or benefits. In the words of Cheney and Moses (1992) investment brings forth visions of profit, risk, speculation, and wealth. They have briefly described the categories and types of investment alternatives. They describe that the basic investment objectives, the expected rate of return, the expected risk, taxes, the investment horizon and investment strategies are the factors to be considered in choosing among investment alternatives.

In finance, the purchase of a financial product or other item of value with an expectation of favorable future returns. In general terms, investment means the use money in the hope of making more money. In business the purchase by a producer of a physical good, such as durable equipment or inventory, in the hope of improving future business.

Sharpe et al (2003) make distinction between real investment and financial investment. “Real investments involve some kind of tangible asset, such as land, machinery, or factories. Financial investments involve contracts written on pieces of paper, such as common stocks and bonds” (Sharpe et al, 2003:1).

They further discussed about the globalization of the investment business and write that the growth in foreign security markets significantly increase international opportunities for U.S. investors. They have conducted a comparative study of distribution of total market value of common stock markets around the world in 1970 and in 1996, which reveal that the total proportion of the world’s common stocks represented by the United States has declined over the last 25 years from almost two-thirds to roughly 45% in 1996.

2.1.2 The Investment Process

The investment process describes how an investor should go about making decisions with regard to what marketable securities to invest in, how extensive the investments should be, and when the investments should be made. A five-step procedure for making these decisions forms the basis of the investment process (Bailey, et.al, 2004).

1. Set investment policy
2. Perform security analysis
3. Construct a portfolio
4. Revise the portfolio
5. Evaluate the performance of the portfolio

2.1.3 Set Investment Policy

The initial step, setting investment policy, involves determining the investor's objectives and the amount of his or her investable wealth. Because there is a positive relationship between risk and return for sensible investment strategies, it is not appropriate for an investor to say that his or her objective is to "make a lot of money". What is appropriate for an investor in this situation is to state that the objective is to attempt to make a lot of money while recognizing that there is some chance that large loss may be incurred. Investment objectives should be stated in terms of risk and return.

This step in the investment process concludes with the identification of the potential categories of financial assets for inclusion in the portfolio. This identification will be based on, among other things, the investment objectives, amount of investable wealth, and tax status of the investor.

2.1.4 Perform Security Analysis

Performing security analysis involves examining several individual securities (or groups of securities) within the broad categories of financial assets previously identified. One purpose for conducting such examinations is to identify those securities that currently appear to be mispriced. Two popular approaches to security analysis are Technical Analysis and Fundamental Analysis.

Technical analysis involves the study of stock market prices in an attempt to predict future price movements for the common stock of a particular firm. Initially, past prices are examined in order to identify recurring trends or patterns in price movements. Then more recent stock prices are analyzed in order to identify emerging trends or patterns that are similar to past ones. This analysis is done in the belief that these trends or patterns repeat themselves. Thus by identifying an emerging trend or pattern, the analyst hopes to predict accurately future price movements for that particular stock.

Fundamental Analysis begins with the assertion that the "true" or "intrinsic" value of any financial asset equals the present value of all cash flows that the owner of the asset expects to receive. Accordingly, the fundamental stock analyst attempts to forecast the timing and size of these cash flows and then converts them to their equivalent present value by using an appropriate discount rate. More specifically, the analyst must attempt not only to estimate this discount rate but also to forecast the stream of dividends that a particular stock will provide in the near future; this process is equivalent to forecasting the firm's earning per share and payout ratios. Once the true value of the common stock of a particular firm has been determined, it is compared with the current market price of the common stock in order to see whether the stock is fairly priced. The magnitude of the difference between the true value and the current market price is also important information, because the strength of the analyst's conviction that a given stock is mispriced will depend, in part, on it. Fundamental analysis believe that any notable cases of mispricing will be corrected by the market in the

near future, meaning that prices of undervalued stocks will show unusual appreciation and prices of overvalued stocks will show unusual depreciation.

2.1.5 Portfolio Construction

Portfolio construction, involves identifying those specific assets in which to invest, as well as determining the proportion of the investor's wealth to put into each one. Here the issues of selectivity, timing, and diversification need to be addressed by the investor. Selectivity, also known as micro forecasting, refers to security analysis and thus focuses on forecasting price movements of individual securities. Diversification involves constructing the investor's portfolio in such a manner that risk is minimized, subject to certain restrictions.

2.1.6 Portfolio Revision

Portfolio revision concerns the periodic repetition of the previous three steps. That is, over time the investor may change his or her investment objectives, which, in turn, may cause the currently held portfolio to be less than optimal. Perhaps the investor should form a new portfolio by selling certain securities that are currently held and purchasing certain others that are not currently held. Another motivation for revising a given portfolio is that over time the prices of securities change, meaning that some securities that initially were not attractive may become attractive and others that were attractive at one time may no longer be so. Thus the investor may want to add the former to his or her portfolio, while simultaneously deleting the latter.

2.1.7 Portfolio Performance Evaluation

Portfolio performance evaluation, involves determining periodically how the portfolio performed, in terms of not only the return earned but also the risk experienced by the investor. Thus appropriate measures of return and risk as well as relevant standards (or "benchmarks") is needed.

2.2 Common Stock

Common stock represents equity or an ownership position in a corporation. It is a residual claim, in the sense that creditors and preference shareholders must be paid as scheduled before common stock holders can receive any payments. In bankruptcy, common stock

holders are in the principal entitled only to any value remaining after all other claimers have been satisfied.

Common stock holders are entitled certain rights. They will have the right to control the corporations through voting right. They can elect the Board of Directors. They will also have preemptive right and residual right. Common stock holders have only limited liability. They don't bear liability exceeding the par value of common stock. They are the primary claimer of income after bearing all the costs and expenses. Common stock values are denoted by par value, book value and market value.

Par Value

The face value of one stock established at the time the stock is initially issued is known as par value. The par value of a common stock remains unchanged unless and until the stock split or reverse split exists. Generally, common stocks carry Rs. 100 par value.

Book Value

The sum of the cumulative retained earnings and other entries such as common stock and capital contribution in excess of par value under stockholder's equity is the book value of equity. The book value per share s calculated by dividing the book value of the equity by the number of shares outstanding. Higher profit indicates higher book value.

Market Value

The value of share in secondary market is the market value. Market value is influenced by various factors such as economic and industry conditions, expected earnings and dividends and market and company risk.

2.2.1 The Efficient Markets Hypothesis and the Share Price Movements

An efficient market is one where shares are always correctly priced. In an efficient capital market, current market prices fully reflect available information. Therefore, if the market is efficient, it uses all information available for setting a price. Market efficiency, as reflected by the Efficient Market Hypothesis (EMH), may exist at three levels - the weak form, the semi-strong form and the strong form.

The weak form of EMH states that the current share prices fully reflect all information contained in the past price movements. If this level of efficiency holds, there is no value in trying to predict future price movements by analyzing trend in past price movements. The stock price movements will not follow any pattern; this is known as random walk. Therefore, the weak form of EMH argues that the trend offers no clues as to tomorrow's price - the stock market has no memory. The stock prices will fluctuate more or less randomly, any departure from randomness being too expensive to determine.

The semi-strong form of the EMH states that the current market prices reflect not only all past price movements, but all publicly available information. There is no benefit in analyzing existing information, such as that given in published accounts, after the information has been released; the stock market has already captured this information in the current share price. Only those with the access to information prior to its general release can earn superior or abnormal returns over the normal return expected for the associated degree of risk.

The strong form of the EMH goes beyond the previous two by stating that current market prices will reflect all relevant information- evenly if privately held. The market prices reflect the true or intrinsic value of the share based on the underlying future cash flows. The implications of such a level of market efficiency are clear and no one can consistently beat the market i.e. earn abnormal returns. In the real world, the strong form of EMH does not exist. The stock markets in most of the developed countries appear in the semi-strong form while the stock markets in the developing countries seem to be in the weak form of the EMH. For the later, the stock prices in developing markets thus follow a random walk.

2.2.2 The Concept of Stock Valuation

The concept of value is at the heart of financial management. The value of any tradable item is whatever the bidder is prepared to pay. With a well-established asset market, valuation is relatively simple. So long as the market can be accepted as being reasonably efficient, then the market price can be trusted as a fair assessment of value. Several analytical techniques are available to assist the financial manager for valuing common stock. The investor expects regular earnings in the form dividends and capital gains from the upward movement of the stock price. Therefore, the valuation model should account for all these factors. Some of the

basic valuation models used to determine the intrinsic value of the stocks are: Net Asset Value (NAV); the Dividend Discount Model (DDM); and Price- Earnings (P/E) model. These different models are discussed below:

2.2.3The NAV Model

The NAV is the value of total assets less current liabilities and long term debt, which is financed by shareholders' net-worth. The shareholders' net-worth comprises of paid-up capital, share premium, accumulated profit and other free reserves, which belong to shareholders. The NAV per share or the book value per share is determined dividing the total NAV by number of outstanding shares.

NAV (Book Value) per share = Net Asset Value/Number of Shares Outstanding

2.2.4 The DDM Model

The DDM states that the value of a share now is the sum of stream of future discounted dividends, plus the value of the share as and when sold in some future year. Therefore, the value of a share today is a function of the cash inflows expected by the investors and the risk associated with the cash inflows.

V_0 = D1 /(1+K)1 + D2 /(1+K)2 + D3 /(1+K)3+ .....+ Dt /(1+K)n or
V_0 = □Dt / (1+K)t

In the model, V_0 represents the intrinsic or the theoretical value of the stock today, D_t is the dividend expected in nth year and the K is the firm's cost of equity capital. The equation stated above assumes that dividend will grow at a given rate and the amount of dividend will be different in different years. A zero growth stock is a stock from which the investor expects a constant amount of dividend each year and where the dividend is not expected to grow. In such case the price of the stock now, V0, is calculated by dividing the amount of dividend by the cost of equity.

V_0 = D /K

Generally, dividend is expected to grow at a given rate (g). Myron J. Gordon developed an equation to value the stock price for a growing firm. It is often called the Gordon Model.

$V_0 = D1 /(K -g)$

D1 is the next expected dividend and g is the growth rates in dividends.

2.2.5 The P/E Model

This model requires only an estimate of price–earnings ratio. It uses earnings rather than dividends in determining the intrinsic value of the stock. Under this model, the intrinsic value of the stock today is calculated as follows:

$V_0 = M*E$

M is the estimate if earnings multiplier or P/E ratio and E is the estimates of earnings.

The theoretical multiplier (M) for a company that distributes all earnings as dividends and has no earnings growth is equals to:

M= D/E /K = 1/K

If the company retains parts of its earnings and that result in earnings growth, the theoretical multiplier (M) can be calculated as:

M= [D/E(1+g)]/[K–g]

The growth rate (g), being the product of retention ratio (b) and return on incremental capital (r), will be zero if the company does retain earnings and distributes all its earnings as dividends (b=0) or the if the company produces no additional earnings on retention (r=0).

2.3 Return

Return is reward for investment. Historical returns allow the investor to assess the future or unknown returns, which is also called expected return. Expected returns are the ex-ante returns and such predicted return may or may not occur. Fisher and Jordan (2000) have discussed about components of return. They have identified returns is the composition of periodic cash receipts and change in price of asset. Return can be positive or negative. Cheney and Moses (1992) explain return in terms of single period. They have defined it as holding period return and calculated by comparing the return to the amount initially invested. Brealey and Myers (2000) have written it as summation of cash payment received due to ownership plus price appreciation divided by the beginning price. This is also a

measurement of return for a single period. Cheney and Moses (1992) have further described the calculation of expected return from arithmetic and geometric mean approach. Geometric mean return is consistent with assumption of reinvesting income when it is received. Due to inherent bias in the arithmetic mean, the geometric mean will always be equal to or less than the arithmetic mean. The arithmetic mean and geometric mean will only be equal when the holding period returns are constant over the investment horizon. However, Van Horne and Wachowicz (2002) have also agreed and further defined it a tool for measurement of return for investment horizon of one year or less. They have suggested for longer periods, it is better to calculate rate of return as an investment yield. The yield calculation is present value based and this considers the time value of money. Further, return for the future can be determined from the probabilities of different phases of economy, viz., prosperity, recession, depression and recovery. Weston and Copeland (1992) illustrated the use of probability from the normal distribution concepts. They have defined expected return as summation of the product of probabilities of different stages in an economy and rate or return.

2.4 Risk

Risk is the feeling of negative returns. In the words of Cheney and Moses (1992) risk is uncertainty of whether the money investors lend will be returned. They have regarded such risk as bankruptcy risk. According to them, stockholder of the firm should not only consider bankruptcy risk but also the risk that the firm will yield a rate of return below some targeted rate. They have given range, variance, standard deviation, CV and beta as parameters for the measurement of risk. However, variance may have first been suggested as a measure of economic risk by Fisher (1906).

2.4.1 Systematic risk

Systematic risk has been defined as undiversifiable risk, which is beyond the control of the organization. Beta values for assets generally range between + 0.5 and 2.0. Fisher and Jordan (2000), however, write nearly all betas are positive and most beta lie somewhere between + 0.4 and 1.9. Weston and Copeland (1992) write if the return on the individual investment fluctuates by exactly the same degree as the returns on the returns on the market as a whole, the beta for the security is one. Cheney and Moses further describe that standard deviation contains two parts – diversifiable and non-diversifiable risk. Systematic risk can

be diversified away by combining the assets with a portfolio of other assets. Further, they have explained that systematic risk is the ratio between covariance (j,m) and standard deviation of the market. Unsystematic risk has been defined as product of standard deviation of assets and the $(1 - \rho_{jm})$. But Weston and Copeland (1992) has defined that systematic risk is the product of b^2 and Var $(R_{m,t})$ and Unsystematic risk as Var $(\varepsilon_{i,t})$. Fisher and Jordan (2000) define systematic risk as portion of total variability in return caused economic, political and sociological changes.

Weston and Copeland described that if the undiversifiable (or systematic) risk in the return of an investment is greater than for the market portfolio, then the beta of the individual investment is greater than one, and its risk adjustment factor is greater than the risk adjustment factor for the market as a whole. If the general economic environment is stable, if industry characteristics remain unchanged and management policies have continuity, the measure of beta will be relatively stable when calculated for different time periods. However, if these conditions of stability do not exist, the value of beta will vary.

Beta depicts the sensitivity of the security's excess returns to that of the market portfolio. If the slope is 1, it means that excess returns for the stock vary proportionately with excess returns for the market portfolio. In other words, the stock has the same unavoidable or systematic risk as the market as a whole. A slope greater than 1 means that the stock's excess return varies more than proportionately with the excess return of the market portfolio. This type of stock is often called an "aggressive stock. A slope less than 1 means that the stock has less unavoidable or systematic risk than does the market as a whole. This type of stock is often called a "defensive" stock (Weston & Copeland, 1992).

Changes in the economic, political and sociological environment that effect securities markets are source of systematic risk. Systematic variability of return is found in nearly all securities to varying degrees because most securities tend to move together in a systematic manner.

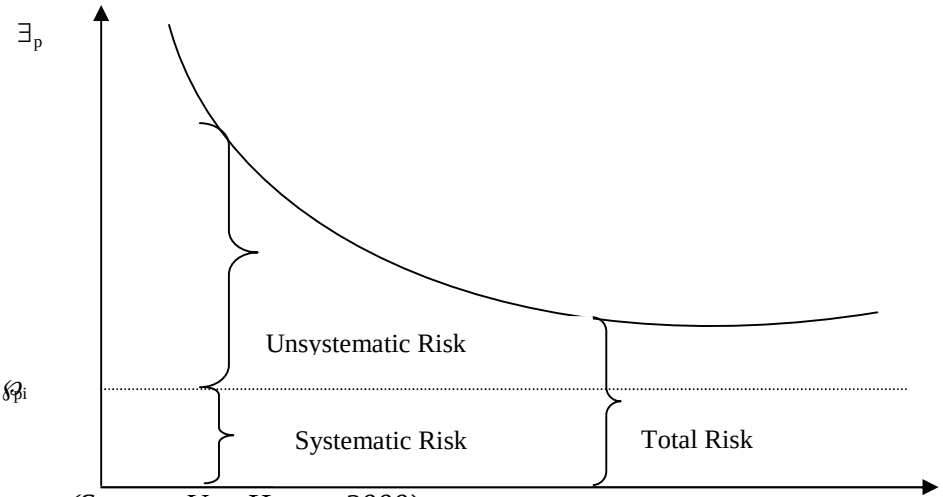
2.4.2 Unsystematic Risk

It is the amount of a stock's variance unexplained by overall market movements. IT can be diversified away. It derives from the variability of the stock's excess return not associated

with movements in the excess return of the market as a whole. "Events such as labor strikes, management errors, inventions, advertising campaigns, shifts in consumer taste, and lawsuits cause unsystematic variability in the value of a market asset. Since unsystematic changes affect one firm, or at most a few firms, they must be forecast separately for each firm and for each individual incident. Unsystematic security price movements are statistically independent from each other, and so they may be averaged to zero when different assets are combined to form a diversified portfolio.

Figure 1.1

Risk and Diversification



(Source: Van Horne, 2000)

2.4.3 Diversification of Risk

Cheney and Moses (1992) define that through the portfolio effect the diversifiable risk can be reduced. However, the reduction in the volatility occurs when the returns of the two securities do not move together. They described that such relationship can be described by the correlation coefficient. High negative correlation only results significant decrease in the total risk. Non-diversifiable risk, also referred to as systematic risk, has as its source factors that affect all marketable assets and thus cannot be diversified away. For example, a chance in expectations about the rate of inflation is pervasive; it will have an influence on all marketable assets and cannot be avoided by diversification. Evans and Archer (1968) write in USA, it has been found that holding about fifteen shares can eliminate unsystematic risk. Gupta (1981) writes in the context of India, a portfolio of forty shares can almost totally eliminate unsystematic risk.

2.4.4 Risk Diversification through Portfolio Construction

Elton and Gruber (2001) described the effect of diversification. They write portfolio with 1 to infinity of assets will have decreasing pattern of the expected portfolio variance. They have supported this interpretation through an artificial example and concluded as more and more securities are added, the average variance on portfolio declines until it approaches the average covariance.

They further write effectiveness of diversification in reducing the risk of a portfolio varies from country to country. The average covariance relative to the variance varies from country to country. Thus in Switzerland and Italy securities have relatively high covariance indicating that stocks tend to move together. On the other hand, the security markets in Belgium and the Netherlands tend to have stocks with relatively low covariance. For these latter security markets, much more of the risk of holding individual securities can be diversified away. Diversification is especially useful in reducing the risk on a portfolio in these markets.

2.4.5 Simple Diversification

Simple diversification is the random selection of securities that are to be added to a portfolio. Simple diversification reduces a portfolio's total diversifiable risk to zero and only un-diversifiable risk remains (Joshi, 2002:23).

Clarkes defines simple diversification as "not putting all eggs in one basket" or "spreading the risks". Evans and Archer (1968), made sixty different portfolios of each size from randomly selected NYSE stocks and proved the decrease in the un-diversifiable risk with increase in the number the securities in the portfolio. They made the portfolio from randomly selected securities and allocated equal weights. "Spreading the portfolio's assets randomly over two or three times as many stocks cannot be expected to reduce risk any further" (Clarkes, 1998: 229).

2.4.6 Superfluous Diversification

"It refers to the investors spreading himself in so many investments on his portfolio. The investor finds it is impossible to manage the asset on his portfolio because the management of a large number of assets require a knowledge of the liquidity of each investment return, tax liability and thus becomes impossible without specialized knowledge" (Joshi, 2002:23).

In this context, Clarkes adds that superfluous diversification usually result in the following portfolio management problems.

Impossibility of good portfolio management

1. Purchase of lackluster performers
2. High search costs
3. High transaction costs

He described that although more money is spent to manage a superfluously diversified portfolio; there will most likely to be no concurrent improvement in the portfolio's performance. Thus, superfluous diversification may lower the net return to the portfolio's owners after the portfolio's management expenses are deducted.

2.4.7 Diversification across Industries

Another diversification can be experienced from the combination of the stocks from different industries. The basic principle of diversifying assets across the industries is the losses incurred in one stock can be compensated through the gain realized from the profitable stocks. Fisher and Lorie (1970) have made an empirical research on random and across industry diversification of portfolios containing 8, 16, 32, and 128 NYSE listed common stocks where they have concluded that diversifying across industries is not better than simple diversification and increasing the number of different assets held in the portfolio above eight does not significantly reduce the portfolio's risk.

2.4.8 Simple Diversification across Quality Rating Categories

Study of Wagner and Lau (1971) explains the effects of simple diversification across stocks that have the same Standard and Poor's quality ratings. Their study consists of six diversified portfolios each containing 20 equally weighted common stocks that all have identical quality ratings. Their empirical study supported the economic theory, which suggest that risk-averse investors should require higher average rates of return in order to induce them to assume higher levels of risk. Further their study revealed simple diversification yields significant risk reductions within homogeneous quality rating categories against the risk reductions within the heterogeneous samples used by Evans and

Archer (1968). They concluded their study, as the highest quality portfolio of randomly diversified stocks was able to achieve lower levels of risk than the simply diversified portfolios of lower-quality stocks. This result reflected the fact that default risk (as measured by the quality ratings) is part of total risk. Their findings suggested that portfolio managers could reduce portfolio risk to levels lower than those attainable with simple diversification by not diversifying across lower-quality assets.

2.4.9 Markowitz Diversification

A rational investor always attempts to minimize risk and maximize return on his investment. Investing in more than one security is a strategy to attain this often-conflicting goal. In 1952, Harry M. Markowitz developed a model that could be used to systematically operationalise the old adage – don't put all eggs in one basket. Markowitz's portfolio model is concerned with selecting optimal portfolio by risk adverse investors. According to the model risk adverse investors should select efficient portfolios, the portfolio that maximizes return at a given level of risk or minimize risk at a given level of return, which can be formed by combining securities having less than perfect positive correlations in their returns. Markowitz model was theoretically elegant and conceptually sound. However, its serious limitation was the volume of work well beyond the capacity of all except a few analysts. To resolve the problem William F. Sharpe developed a simplified variant of the Markowitz model that reduces substantially its data and computational requirements (Sharpe 1963). As per Sharpe's model, the construction of an optimal portfolio is simplified if a single number of measures the desirability of including a stock in the optimal portfolio. If we accept his model, such a number exists. In this case, the desirability of any stock is directly related to its excess return-to-beta ratio. If the stocks are ranked from highest to lowest order by excess return to beta that represents the desirability of any stock's inclusion in a portfolio. The number of stocks selected depends on a unique cutoff rate such that all stocks with higher ratios will be included and all stocks with lower ratios excluded.

Markowitz (1991) writes "The basic concepts of portfolio theory came to me one afternoon in the library while reading John Burr Williams' *The Theory of Investment Value*" (1938). As precocious as Williams was (providing the first derivation of the "Gordon growth formula," the Modigliani-Miller capital structure irrelevancy theorem, and strongly advocated the dividend discount model), Williams had very little to say about the effects of

risk on valuation because he believed that all risk could be diversified away. Markowitz (1952) defined combining assets which are less than perfectly positively correlated can reduce portfolio risk without sacrificing portfolio returns. In 1955, Markowitz made as an elaboration of the ideas in Portfolio Selection in his doctoral thesis.

"Although the Markowitz paradigm for portfolio selection was unquestionably one of the great innovations in financial theory, it left the investor with awesome obstacles to its practical application. The identification of efficient portfolios from a universe of only 50 securities involves a total of 1,225 calculations: 50 expected returns, 50 variances and 1,125 covariance between each pair of securities: for 500 stocks, the calculations run up to nearly 125,000. On a state-of-the-art IBM computer of the late 1950s, the identification of the efficient frontier from a universe of just 100 securities took 33 minutes and, in 1990 dollars, cost at least $300 in computer time" (Bernstein, 1990: 83-84).

Markowitz's dissertation, which appeared as a book published in 1959, provides that the returns on most securities are correlated. If the Standard and Poor's index rose substantially, we would expect United States Steel (Common) to rise and Sweets Company of America (Common) to rise. For this reason, it is more than likely that United States Steel will do well when Sweets Company does well.

Markowitz's paper is the first mathematical formalization of the idea of diversification of investments: the financial version of "the whole is greater than the sum of its parts": through diversification, risk can be reduced (but not generally eliminated) without changing expected portfolio return. The decision to hold a security should not be made simply comparing its expected return and variance to others, but rather the decision to hold any security would defend on what other securities the investor wants to hold. Securities could not be properly evaluated in isolation, but only as a group.

2.4.10 Portfolio Theory Assumption

The portfolio selection model developed by Harry M. Markowitz is based on several assumptions regarding investor's behavior.

- Investors consider each investment alternative as being represented by a probability distribution of expected returns over same holding period.

- Investors maximize one period-expected utility and posse's utility curve, which demonstrates diminishing marginal utility of wealth.
- Individual estimates risk on the basis of the variability of expected returns.
- Investor's base decisions are solely depend upon expected return and variance analysis of return only.
- For a given risk level, investors prefer high returns to lower returns. Similarly, for a given level of expected return, investors prefer less risk to more risk.

2.4.11 Portfolio Analysis of Two Assets and Impact of Correlation Analysis

I) Perfectly Positively Correlated ($r_{AB} = +1$)

If the two assets are perfectly positively correlated with each other i.e. correlation coefficient is +1, diversification of risk technique cannot minimize the risk. In perfectly positively correlation, the increase in expected return will increases the return of other assets simultaneously or vice versa. Therefore, making portfolio with positive correlated assets is not effective.

II) Zero Correlated ($r_{AB} = +0$)

If the correlation between two assets is zero then the correlation is called zero correlation. If the return of two assets is zero correlated, substantial risk reduction benefits can be obtained from diversifying between them.

III) Uncorrelated

The portfolio expected return is unaffected by changing the correlation between assets because r_{AB} is not a variable in the portfolio return equation. The substantial risk reductions available by diversifying across uncorrelated assets are readily available to all investors. The research has shown that common stock price indexes, bond price indexes, and commodity price indexes all tend to be uncorrelated.

IV) Perfectly Negatively Correlated ($r_{AB} = -1$)

If the correlation between two assets is negative unity, it will be known as perfectly negatively correlation. In such correlation, the direction of expected return of one asset is opposite to the direction of return of other assets or if the expected return of one-asset increases, it will decreases the expected return of other assets. The risk is minimized

through combining two assets in correct proportions to form risk less portfolio like the one at $X_A = 2/3$ and $X_B = 2/3$.

2.4.12 Mean-Variance Indifference Curves

Indifference curves represent the investor's risk-return preferences. Through indifference curves, it is possible for an investor to determine the various combinations of expected returns and risks that provide a constant utility. Joshi (2002) writes that the curves can be drawn on a two dimensional figure, where the horizontal axis indicates risk as measured by standard deviation (denoted by σ_p) and the vertical axis indicates reward as measured by expected return (denoted by r_p)

"The sets of mean-variance indifference curves are literally a theory of choice. The only assumptions necessary to draw the indifference curves for risk-averse investors are People prefer more wealth to less

They have diminishing marginal utility of wealth. These assumptions, if valid, imply that all decision makers are risk averse and will require higher return to accept greater risk" (Weston and Copeland, 1992: 361-363). Indifference curves cannot intersect. "A risk averse investor will find any portfolio that is lying on an indifference curve that is "farther north-west" to be more desirable (that is, to provide greater utility) than any portfolio lying on an indifference curve that is "not as far northwest". Last, he further describes that an investor has an infinite number of indifference curves" (Sharpe et al, 2003: 147).

2.4.13 Efficient Frontier or Efficient Set Theorem

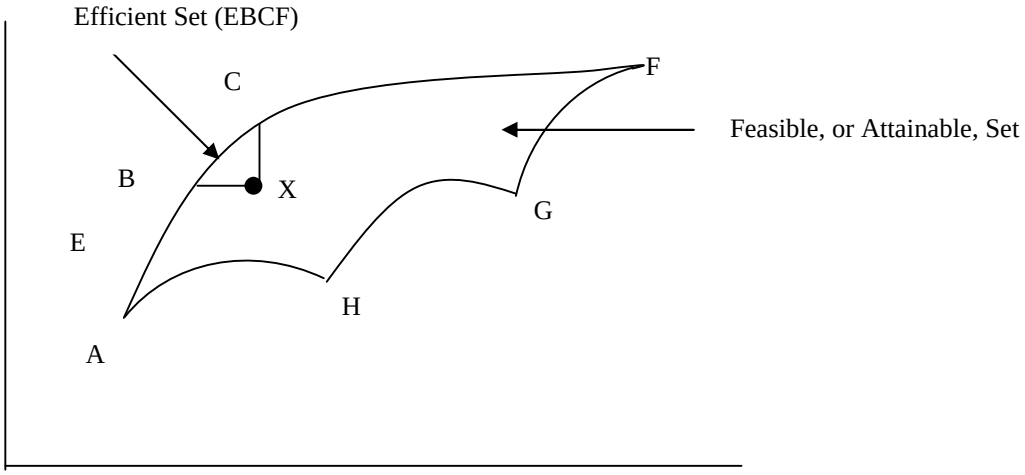
Collections of possible portfolios are the attainable sets. Cheney and Moses (1992) define at any given level of risk or return, however there is one portfolio that provides the highest (lowest) level of expected return or risk. This set of portfolio that dominates all other portfolios in the attainable set is referred to as the efficient frontier. They further add once the investor has determined the expected returns and standard deviations for each of the assets and the correlation coefficients between the assets, then the portfolios on the efficient frontier can be identified. Estimation of the efficient frontier requires quadratic programming that will simultaneously estimate the minimum portfolio risk at each level of expected return.

If we consider the infinite number of portfolios that could be formed from two or more securities and plotted portfolios expected return and risk, we would create a graph like the one in figure 2. An efficient frontier or portfolio is a portfolio that

1. Offers maximum expected return for varying levels of risk, and
2. Offers minimum risk for varying level of expected return.

Figure 2.2

The Efficient Frontier



(Source: Sharpe 2002:172)

Portfolios to the left of the efficient frontier are not possible, because they lie outside the attainable set. Portfolios to the right of the efficient frontier are inefficient because some other portfolio could provide either a higher return with same degree of risk or a lower risk for the same rate of return. In figure above, C is the portfolio that provides higher return than portfolio X with same level of risk. Another portfolio B is the portfolio that provides the same return as portfolio X with less risk. Because of both portfolios C and B lies in efficient frontier.

2.4.14 Selection of the Optimal Portfolio

To select an optimal portfolio, an investor should plot his or her indifference curves on the efficient set and then proceed to choose the portfolio that is on the indifference curve that is farthest northwest. This portfolio will correspond to the point at which an indifference curve is just tangent to the efficient set. As can be seen in the figure 2.3, this is portfolio O* on indifference curve I2. Although the investor would prefer a portfolio on I3, no such portfolio exists; wanting to be on this indifference curve is just wishful thinking. In regard

to I1, there are several portfolios that the investor could choose (for example O). However, the figure shows that portfolio O* dominates such portfolios because it is on an indifference curve that is farther northwest. The portfolio selection for a highly risk- averse investor has been shown in Figure 2.4.

Figure 2.3

Selecting an Optimal Portfolio

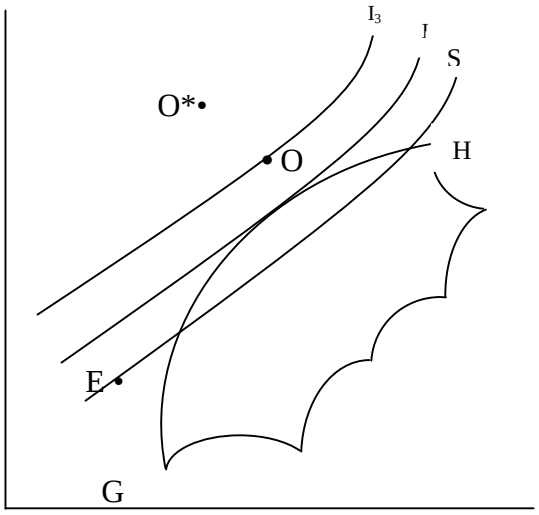
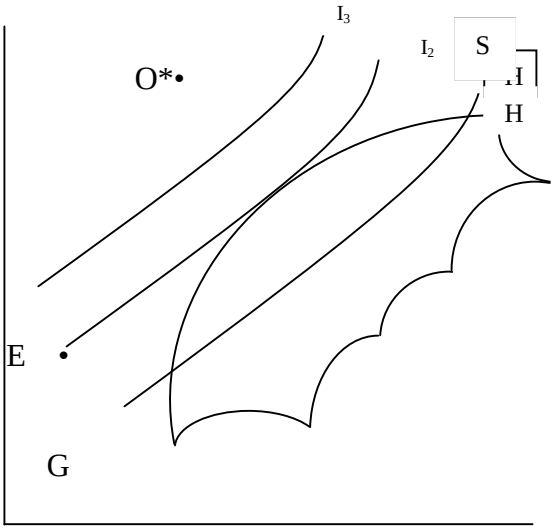


Figure 2.4

Portfolio Selection for a Highly Risk- Avers Investor



(Source: Sharpe 2002: 173)

Upon reflection, the efficient theorem is quite rational. The efficient set theorem, stating that the investor needs to be concerned only with portfolios that lie on the northwest boundary of the feasible set, is a logical consequence.

2.4.15 Security Market Line or CAPM Equation

Sharpe, Treynor, Mossin and Lintner originally developed Security Market Line or the CAPM Equation. SML shows the picture of market equilibrium. Weston and Copeland (1992) explain SML provides a unique relationship between undiversifiable risk (measured by β) and expected return. Capital Assets Pricing Model is an equilibrium theory of how to price and measure risk. Logic of the security market line is that the required return on any investment is the risk-free return plus a risk-adjusted factor.

Myers & Brealey, (2003) the capital assets pricing model states that the expected risk premium on each investment is proportional to its beta. This means that each investment

should lie on the sloping security market line connecting Treasury bills and market Portfolio.

Brigham and Weston (n.d.) have defined that if the rate of change in the risk free rate and market rate of return is the same, then the slope of the SML remains the constant, and however, the slope does not remain constant if the rate of change differs.

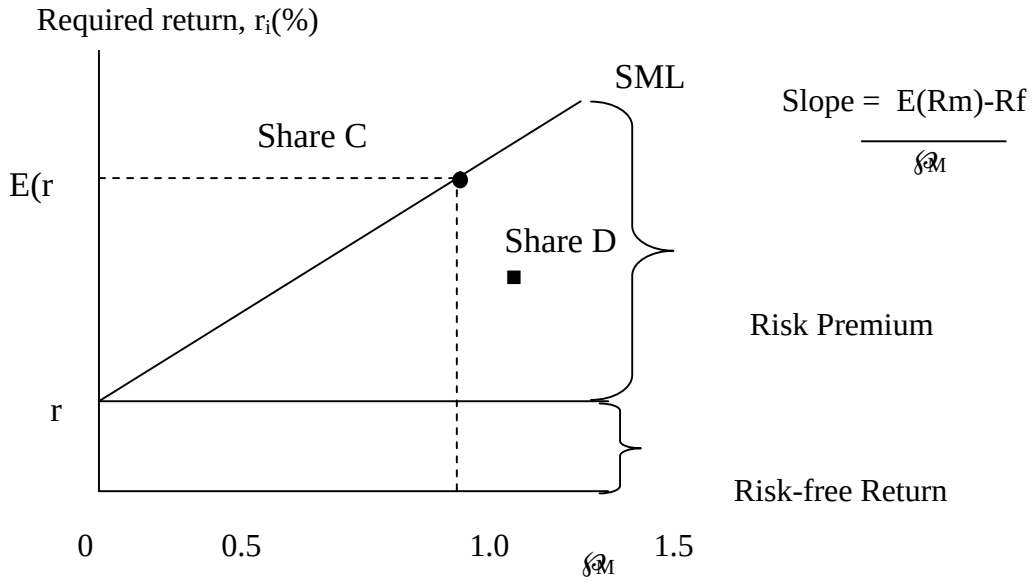
In market equilibrium, the relationship between an individual security's expected rate of return and its systematic risk, as measured by beta, will be linear. The relationship is known as the security market line.

Weston and Copeland (1992) write that the changes in expected inflation do not change the slope of the Security Market Line (SML). Rather they cause parallel shifts in the SML.

It assumes equilibrium where required rate of return is equal to the expected rate of return. Further the model defines disequilibrium condition appears when:
Expected Rate of Return > Required Rate of Return = Under priced
Expected Rate of Return < Required Rate of Return = Overpriced

Figure 2.5

The Security Market Line / CAPM



(Source: Van Horne, 2000:71)

Share C lies above the SML, it is expected to offer a return greater than that required by the market for that level of risk: its expected return $E(r_M)$is greater than its required return. Share C is undervalued or under priced. Alternatively, share D lies below the SML, it is expected to provide a return below that required by the market for that corresponding level of risk. When the expected rate of return is greater than the required rate, investors will try to purchase shares of the stock; this will drive the price upward.

If the expected rate of return is less than the required rate; investors will desire to sell the stock; there will also be a tendency for the price to decline.

2.4.16 Assumptions of the CAPM

Capital market theory (CMT) uses portfolio theory; thus the assumptions underlying portfolio theory also pertain to the CAPM. The additional assumptions underlying CMT and the CAPM appear less realistic than the portfolio theory assumptions. The assumptions of CMT are as follows:

1. All investors are risk- averse. Thus, all investors seek to be on the efficient frontier.
2. There are no constraints on the amount of money that can be borrowed or lent. Borrowing and lending occur at the identical risk-free rate, $R_{f.}$
3. All investors have identical beliefs about the expected returns and risks of assets and portfolios; that is all investors have homogeneous expectations.
4. All investors have a common investment horizon, whether it be one month, three months, one year, or whatever.
5. All the investments are infinitively divisible and marketable; that is, it is possible to buy or sell any portion of an asset or portfolio.
6. Taxes and transaction costs do not exist. That is, there are no tax effects, costs of acquiring information or transaction costs associated with buying or selling securities. These are often referred to as perfect market assumptions. Markets are assumed to be competitive; therefore, the same investment opportunities are available to all investors.
7. There are no unanticipated changes in inflation or interest rates.
8. The capital markets are in a state of equilibrium or striving toward equilibrium. There are no under priced or overpriced securities; if under pricing or overpricing exists, the prices will move to correct this disequilibrium situation.

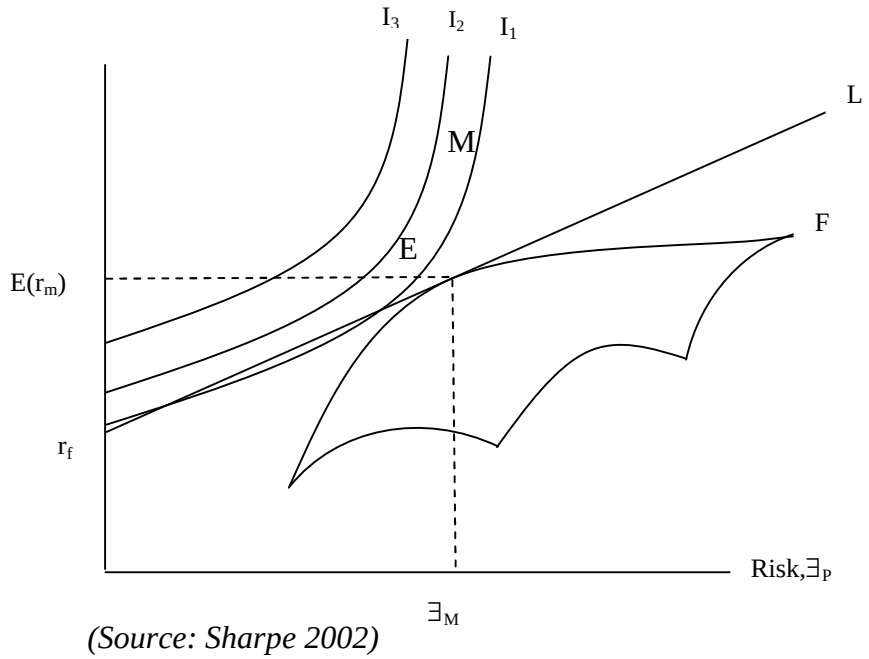
2.5 Capital Market Line

"The efficient frontier that can be constructed without borrowing or lending is convex towards the E(r) axis in risk-return space. However, if borrowing and lending opportunities are included in the analysis, linear set of investment opportunities called the capital market line (CML) emerges" (Clarks, 1998: 251).

Sharpe (1964) writes the CML is the locus of the portfolios that wealth-seeking risk-averse investors will find more desirable than any other portfolios. Fisher and Jordon (2000) describe that all investors will end up with portfolios somewhere along the CML and all efficient portfolios would lie along CML. However, not all securities or portfolios lie along the CML. From the derivation of the efficient frontier we know that all portfolios, except those that are efficient, lie below the CML. Observing the CML tells us something about the market price of risk.

Figure 2.6

The Capital Market Line



(Source: Sharpe 2002)

The CML starts with the risk free asset r_f and is tangent to the risky portfolio M on the Markowitz efficient frontier. Portfolio M is the only risk portfolio.

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

To the right of M, investors are borrowing at if and investing more in M they are utilizing leverage. Portfolio M is called the market portfolio and contains all assets. All portfolios on the line between M and L represent borrowing portfolis.

R_f ML represents the risk return trade off for efficient portfolios. It shows the capital market equilibrium relationship between risk and return for efficient portfolios consisting of various combinations of the risk free asset and the market portfolio. If investors are to invest in risky securities they must receive a risk premium [E(rM)-rf] to compensate for the added risk. Risk premium is an excess return over the risk free rate, expected for incurring the risk associated with the market portfolio, $\exists_{M.}$

Therefore,

Slope of CML $\dfrac{[E(Rm)-Rf]}{\exists_M}$

The slope of the CML is called the market price of risk and is reward per unit of risk. Because the CML shows the trade off between return and risk for efficient portfolios, the unit of risk must be the portfolio standard deviation. Therefore the equation for the CML is:

$$E(R_P) = \frac{R_f + [E(R_M)-R_f]}{\exists_M} \times \exists_P$$

Where,

$E(r_P)$ = the required rate of return on any efficient portfolio on the CML.

Rf = the risk free rate of return

E(rM) = the expected rate of return on the market portfolio.

$\exists_M$ = the standard deviation of returns on the market portfolio.

$\exists_P$ = the standard deviation of returns on the efficient portfolio.

2.5.1 Investment Performance Evaluation

Sharpe (1963) devised an index of portfolio performance. His model is generally accepted as single parameter portfolio performance index and can be calculated from the both risk and return statistics. This technique ranks the stocks from its excess return-to-beta ratio. If stocks are ranked by excess return to beta (from its highest to lowest), the ranking represents the desirability of any stock's inclusion in a portfolio. Treynor (1965) conceived an index of portfolio performance that is based on systematic risk, as measured by portfolios' beta coefficients. Jensen (1968) has developed another performance measure by modifying the characteristic regression line. His performance measure is a one-parameter investment performance measure. The basic random variables in Jensen's model are risk premiums.

2.5.2 Sharpe's Portfolio Performance Measure

Ranking portfolio's average returns ignores the skill with which they minimize risk and therefore presents an oversimplified picture. Hence, in assessing the performance of a portfolio, it is necessary to consider both risk and return. William F. Sharpe devised an index of portfolio performance for portfolio i as:

$$S_i = \frac{\text{Risk Premium}}{\text{Total Risk}} = \frac{\overline{r_i} - R_f}{\exists_i}$$

Where,

S_i = Sharpe index of portfolio performance for portfolio i

$\overline{r_j}$ = Average return from portfolio i

$\exists_I$ = Standard deviation of returns for portfolio i

R_f = Risk free rate of interest

$r_i - R_f$ is the risk premium for portfolio i. The risk premium is the additional return over the above the risk-less rate that is paid to induce investors to assume risk.

2.5.3 Treynor Portfolio Performance Measure

Jack Treynor conceived an index of portfolio performance that is based on systematic risk, as measured by portfolios beta coefficients. He suggests measuring a portfolio's return

relative to its systematic risk rather than relative to its total risk, as does the Sharpe measure. Treynor's index is ascertained as:

$$T_p = \frac{\text{Risk Premium}}{\text{Systematic Risk Index}} = \frac{r_i - R_f}{\beta_p}$$

Where,

T_p = Treynor's index of portfolio performance for portfolio i

r_i = Average return from portfolio i

β_p = Systematic risk index of returns for Portfolio i

R_f = Risk free rate of interest

2.5.4 Jensen's Portfolio Performance Measure

Dr. Michael C. Jensen has modified the characteristic regression line to make it useful as a one-parameter investment performance measure. The basic random variables in Jensen's model are risk premiums, such as:

$rp_{i,t} = r_{i,t} - R_t$

Where,

$rp_{i,t}$ = Risk premium for asset I in period t

$r_{i,t}$ = One period rate of return from asset I in period t

R_t = Risk free rate observed in period t.

2.6 Review of Previous Articles

Under this section, various masters level dissertation were reviewed. Though the same research topic wasn't available in TU library, some research papers, which are slightly related to this study, have been reviewed. These are as follows. Investing in stocks means owning a share of the company's earnings and any voting rights attached to that investment. A stock certificate is a piece of paper showing roof of ownership. More than likely investors won't see the certificates because their karate keeps these records electronically. A brokerage provides services to investors based upon the market trends.

Morris (1990), in his discussion on "Latin American Banking System in the 1980"s" has concluded that most of the bank concentrated on compliance with central bank rules on reserve requirement credit allocation (Investment Decision) and interest rates. While

analyzing loan portfolio quality, operating efficiency and soundness of bank investment management has largely been overlooked. He further add that miss management in financial

institution has involved inadequate and over optimist loan appraisal high risk diversification of loan portfolio and investment high risk concentration related parties lending etc are major cause of investment and loan that has gone bad.

Pradhan, (1996). has presented a short glimpse on investment in different sectors, its problems and prospects through his article, 'Deposit mobilization, its problem and prospects; In his article, he has expresses that, "Deposit is the life blood of any financial institution, be it commercial bank, finance company co-operative or non-governmental organization; He also added, in consideration of 10 commercial banks and nearly three dozen of finance companies, the latest figure does product a strong feeling that a serious review must be made of problems and prospects of deposit sector. Except few j0int venture banks, other organization rely on the business deposit receiving and credit disbursement In the light of this, Mr. Pradhan has pointed out following problems of deposit mobilization in Nepalese perspectives.

Due to the lesser office hours of banking system people prefers for holding the cash in the personal possession.

- Unavailability of the institutional services in the rural areas.
- No more mobilization and improvement of the employment of deposits in the loan sectors.
- Due to the lack of education most of Nepalese people do not go for saving in institutional manner.

However, they are very much used of saving, be it in the form of cash, ornaments or kind. Their reluctance to deal with institutional system are governments, office hours withdrawal system, availability of depositing facility and so on.

Mr. Pradhan mentioned, deposited mobilization carried out effectively is in the interest of deposits, society, financial sectors and the nation. Lower level of deposit rising allows

squeezed level of loan delivery leaving more room to informal sector. That is why; higher priority to deposit mobilization has all the relevance.

Shrestha (**1997)** in this article 'Nepal Ma Banijya Bank Haruko Bhumika,' has pointed out some important activities and its present scenario. In his words, there activities are to be studied and revised as soon as possible. Otherwise, there may be disaster for the sound and effective banking system. The article is written in Nepali language. Some of the main points of his article are given as:

Possibility of capital flight: In Nepalese perspective, capital flight becomes a major problem whatever capitals were constructed in Rana regime, were already flowed outside the country. Due to misimplementation of 'Bhumi Sudhar' most of the constructed capitals were also flowed away outside the country. Due to the unstable political situation, the possibilities of capital flight seem to be developed in high scale. In this controversial situation joint venture banking become to main sources or medium of capital flight. Therefore, this problem and situation should be seriously studied and analyzed so that corrective action can be taken as soon as possible.

Minimum deposit amounts: in these years, it can be seen that most of the commercial banks and other financial institution have increased the minimum deposit amount (Threshold). This policy may harass the lower level depositors It also affects the banking habits of lower level depositors negatively. This is why this must also be analyzed and implemented after doing long homework.

Effective evaluation of collateral and effective use of loan from the debtor's side: This must be said an effective and crucial step towards the debt recovery from the government side that 'Debt Recovery Act' was announced to be implemented during the Ninth plan.

Shrestha (1998A.D) had written an article "Portfolio Management in Commercial Banks: Theory and Practice" in Nepal Bank Patrikas published by Nepal Bank Limited. In his article, he stated that the portfolio management becomes very important both for individual as well as institutional investors. Investors want to select the best mix of investment assets subject to-

- Higher return
- Good liquidity with adequate safety of investment
- Flexible investment
- Certain capital gains
- Economic, efficient and effective investment mix, and
- Maximum tax concessions.

Shrestha stated that the investors try to hold a well-diversified portfolio that helps to achieve these stated benefits. Investors want to increase their return with certainty by making investment in different sectors.

Sapkota, (1999), we has study performed an analysis of risk and return on common stock investment with special reference to banking industry. The main objective of the study is to analyze risk and return of the common stock in Nepalese security market. The study is focused on the common stock of commercial banks.

In his findings, banking industry is the biggest one in term of market capitalization and turnover. Excepted return on common stock of Nepal bank ltd is maximum i.e. 66.99 percent and common stock of SBI bank is found minimum. In this regard, common stock of Nepal bank ltd. is risky and common stock of SBI bank ltd is least risky. In the context of industries, excepted return of finance and insurance industry is found highest. Excepted return of banking industry is 60.83 percent.

The portfolio standard deviation is less than each individual stock's standard deviation. Hence, the portfolio approach of investment is better way to win the stock market.

Ghimire (1999), has (facts and reality; commercial banks in Nepal, Nepal Samschar patra) published his article in which he has mentioned that must of the commercial banks of Nepal are ready to pay the penalty in spite of investing on rural, priority sector, poverty stricken and deprived areas. In the directives of Nepal Rastra Bank, it is clearly mentioned and directed all the commercial banks (under NRB) should invest 3percent to the lower class of countrymen. However, these commercial banks are unable to meet the requirement of NRB.

Paudel, (2000) conducted a study with the objective of whether the shares of commercial banks were correctly priced by analyzing the realized rates of returns and the required rates of return using the CAPM.

The study was based on the data of Shares of seven sample commercial banks from 1996 to 2001. For the purpose of analyzing risk characterizes of the shares of those commercial banks, Poudel had used standard deviation, the coefficient of variation, the correlation coefficient between the returns of individual bank's share and the return on market portfolio and the beta coefficient. Average return on the 91-day Treasury bill was taken as a risk- free rate of return.

On the basis of this study, it was found that the shares of BOK offers the highest realized rate of return. The prices of the shares of SCBNL, NSBIB, NBBL, EBL and BOK were under priced.

Based on the standard deviation of the returns on shares, the shares of EBL could be considered as high-risk security. The standard deviation of the returns on shares of HBL was the lowest one. On the basis of CV, the share of BOK had the lowest risk per unit of return, the highest being with the shares of NABIL. It was also observed that the systematic risk was negative with the shares of NABIL. Therefore, the total risk on the returns on shares of NABIL was due to company specific characterizes rather than market pervasive. Returns on all the shares except NABIL had positive correlation with the returns on market.

Most of the shares appeared to be defensive as beta coefficients were less than 1. Only the return on shares of BOK had beta coefficient of greater than 1, indicating that the share was more risk than the market.

Paudel (2003), "The shares of commercial banks in Nepal are heavily traded in the stock market and, therefore, these shares play a key role in the determination of stock exchange indicators. All the shares produced higher rates of return than the return on market portfolio. However, the risk-return characteristics did not seem to be the same for all the shares reviewed. "HE further concluded, "Most of the shares fall under the category of defensive

stocks, except the shares of Bank of Kathmandu Limited. From the analysis, it appears that none of the shares are correctly priced."

Nevertheless, Shrestha presented approaches to find out the risk of securities depending upon the attitude of investor towards risk, to develop alternative investment strategies for selecting a better portfolio, which will ensure a trade off between risk and return so as to attach the primary objective of wealth maximization at lowest risk and finally to identify securities for investment to refuse volatility of return and risk.

Pant (2005), Managing Director of Bank of Kathmandu, in his exclusive interview to the expressed that in the case of Nonperforming Assets (NPA), bank must first and foremost, focus on corporate governance and credit risk management.

They need to maintain the transparency and analyze project cash flows and conduct feasibility studies of project before extending credit. In addition, corporate ethics and strong corporate culture with high degree of awareness of credit risk should be present. As a prerequisite, establishing adequate policies and procedures is advisable.

Government authorities including Nepal Rastra Bank can also play a major role in addressing the problem of NPAS. There is a need for a seamless working relationship between all the government authorities such that coordinated efforts to reduce NPAS can be carried out.

Finally the business sector needs to be transparent as well good financial discipline amongst the borrowers; international accounting, auditing and disclosure standard and professionalism are some of the other requirement to reduce NPAS in the future.

2.7 Review of Previous Thesis

Joshi (2002) undertook a thesis work entitled *"Investors' Problems in Choice of Optimum Portfolio of Stocks in Nepal Stock Exchange".* The study is related to this research since his study focused on the creation of optimum portfolio between the stocks of listed companies and the relevant objective of the study was to try to find out the best portfolio of NEPSE to invest".

Joshi used historical common stocks data in order to achieve the objectives. He had constructed two-asset and three-asset portfolio between 21 'A' Grade stocks of listed companies. He had ignored those stocks, which were more variable in terms of covariance.

After analyzing the stocks, Joshi summarized, "Portfolio management is a new concept for Nepalese investors. Due to lack of sufficient information, proper investment is not possible. Proper investment needs huge information internal as well as external. The only one stock exchange located in Kathmandu. Traditional cry system for trading stocks, limited number of securities broker, lack of opportunity of investment and many reasons are there, which are acting as barrier of development of NEPSE."

Joshi further stated that Nepalese investors don't know in which stock to make investment and how to construct a portfolio. Many brokers are not willing to provide information to the investors. Investors are trading the securities mostly under the pressure of brokers.

Joshi had further concluded regarding the portfolio that among the available opportunity sets, available set H seemed very attractive than others sets. Set H had the least covariance of all the available sets and was the optimum portfolio, which consisted of stocks of Paschimanchal Finance Company (PFC) Ltd. and Citizen Investment Trust (CIT) in the proportion of 55% and 45% respectively.

Pandey (2003) conducted a study entitled *"Risk and Return Analysis of Common Stock Investment"*. Under the study, the relevant objectives were to examine risk and return on common stock of individual companies; to calculate risk and return of their portfolio; and to construct the optimum portfolio from listed common stocks.

Pandey had used secondary data of 6 finance companies from F/Y 2052/53 to F/Y 2058/59 (seven years) listed in NEPSE. Besides finance companies, common stocks of Everest Bank Limited from Banking and of Salt Trading Corporation from trading sector had been taken as sample for portfolio analysis. His study is more empirical and less descriptive on the basis of historical data. Opinion survey was also conducted with individual investors, insurance officials, NEPSE staff members, and stock brokers.

The major findings of the study were:
Without proper analysis of individual security industry and overall market, it is almost impossible to beat the stock market.

CV suggests finance and investment sectors are the best for investment. Banking sector is the best for investment from ERR point of view and CV is also not so higher than finance and insurance sectors. KFL is undoubtedly the best investment from the ERR and CV point of view. CIT has lesser volatility with beta of 0.915 from market sensitivity point of view.

Shrestha (2004) conducted a study entitled *" Portfolio Management in Nepal: A Case Study of Listed Commercial Banks in NEPSE"*. In his study, it was found that the expected return of NBB is the highest among all. Similarly, the variance and standard deviation is also considerably high in compare to the returns of the other stocks. /in terms of systematic risk the value of beta is high with the stock of BOK and the portion of systematic risk is also the maximum with the same. SBI stocks recorded the lowest beta and the systematic risk associated with it is also the lowest.

SBI stocks possess the highest value of unsystematic risk, whereas, it is lowest with NIC stocks. Value Coefficient of determination is highest with the stocks of BOK i.e. 0.9691 (96.91%). It implies that 96.91% of BOK's risk is explained by the market.

The tools developed by Sharpe, Treynor and Jensen explain investment performance evaluation. In his study it was revealed that Sharpe's evaluation criteria has ranked the stocks of HBL the first and NIC the last. Whereas, Treynor's and Jensen's criteria has ranked SBI the first and NIC the last.

Shrestha had identified that the NIC banks stocks are overpriced stock and rest of the bank's stock are under priced according to the SML.

In search of optimal portfolio, 747 portfolios at different weights are constructed. To earn 57% rate of return, a portfolio has been identified as an optimal one constructed from the stocks of EBL, BOK, HBL and SCB. Optimal portfolio at 89% return is identified as a portfolio constructed from the stocks of NABIL, NBB and NIC. Portfolio from the

combination of stocks of NABIL, NBB, NIC, NIB, SBI and SCB realized a return of 39%. Similarly, the portfolio of EBL, BOK, HBL, NABIL, NIC, NIB, SBI and SCB yield return of 30% at minimum portfolio standard deviation. However, the research has shown that the optimal portfolio is the portfolio of the stocks of SBI, HBL and SCB with 3%, 68% and 29% investment of funds respectively.

Research hypothesis has shown that there is no significant difference between portfolio return and market return.

Sharma (2004) undertaken a study entitled *"Portfolio Management of Listed Commercial Banks and Insurance Companies in Nepal"*. The study was based on five years historical data from F/Y 1998 to F/Y 2002. The relevant objective of his study were to analyze the return and risk of the common stocks of listed commercial banks and insurance companies; to analyze the diversifiable and undiversifiable risk; and to determine whether the shares of commercial banks and insurance companies are correctly priced or not. Mr. Sharma had analyzed the risk and return of the portfolio created by commercial banks and insurance companies based on two-asset (risk- free and risky market portfolio) portfolio. Major findings of the study were:

- Considering the overall market return and risk, the shares of commercial banks are attractive for investment. However, the common stocks of HBL seemed attractive among all considering risk per unit return. Investors retaining the stocks of SCBNL should assume more risk than any others.
- Considering the return and risk characteristics of the common stock of all the selected insurance companies, the common stock of Everest Insurance Company was more attractive than others.
- The returns on common stocks of all the commercial banks as well as insurance companies in F/Y 1999/2000 were highest among sampled years.
- Almost common stocks of commercial banks and insurance companies moved in the same direction meaning they had positive correlation between them. Hence, no stocks with negative correlation or low positive correlation were available in the stock market.

- The stocks of commercial banks as well as the insurance companies were under priced since their required rates of return were less than their average rates of returns. Hence, active strategy could not work effectively in Nepalese market.
- The major objective of portfolio management of commercial bank was maintaining the liquidity. For insurance companies, the major objective was risk reduction and liquidity maintenance.

Bhatta, (2005) prepared a thesis entitled "Portfolio Management of Listed Finance Companies in Nepal." The main objective of the study was to identify the present situation of portfolio management of finance Company in Nepal with the help of risk return and other relevant variables. This concludes that the most of finance companies have enough unsystematic risk (diversifiable risk) that means there is no effective portfolio management of listed finance companies. In the context of portfolio risk and return of Nepalese finance companies investor has to bear a higher portfolio risk to increase little bid of portfolio return.

The major problem to manage the portfolio is volatility of different securities in Nepalese capital market. For the selection of portfolio in Nepal technical analysis does not work effectively but fundamental analysis work effectively. In Nepalese stock market passive strategy is more suitable then active strategy to achieve better results. Corporate investor think portfolio evaluation is necessary but lack of specific knowledge, they depend on conventional method.

Gautam. (2005) conducted a research on "Portfolio Analysis of investment in Listed Companies". The study was based on five years historical data from F/Y 1999/00 to F/Y 2005/06. Gautam had undertaken the study based on different category, which consists of Commercial Banks, Insurance Companies, Finance Companies, Manufacturing and Processing Companies, Hotels and Trading. The Samples included were Standard Chartered Bank Nepal Limited (SCBNL), Bank of Kathmandu Limited (BOK), Himalayan General Insurance Company Limited, Sagarmatha Insurance Company, Kathmandu Finance Company Limited (KFL), Nepal Housing and Merchant (NHandMFL) finance Limited, NIDC Capital Market (NIDCCM), Nepal Lever Limited (NLL), Bottlers Nepal Limited

(BNL), Hotel Soaltee, Bishal Bazar Company Limited (BBCL) and Salt Trading Corporation (STC).

The major findings were:

- The share of NIDCCM offers the highest average rate of return with the highest standard deviation of returns i.e. 160.69% where as the share of STC offers the negative rate of return with the lowest standard deviation i.e. 7.02%.
- On the basis of Coefficient of variation, the common stock of NH and MFL Merchant finance Limited seems attractive among all with CV 2.03 where as the CV of BBCL was the highest with 169.23.
- The stocks of SCBNL, BNL, BBCL and NLL appeared to be defensive since their beta coefficients were found less than 1.
- NIDCCM has the highest systematic risk i.e. 148.21% where as the stock f BBCL has the least systematic risk.
- All stocks except BBCL were found under priced.
- On the basis of Sharpe index of the portfolio, the portfolio of NHandMFL and KFL were the best performers.
- The portfolio between the stocks of NH and MFL, KFL, BNL and SCBNL with the weights of 15.63%, 14.69%, 20.77% and 48.91% respectively was the best and optimum portfolio from available alternatives.

Kisi, (2006). Entitled "Portfolio Analysis of Commercial Banks in Nepal." Mr. Satya Ram Kisi has made an effort to examine the concept of investment and loans and advances portfolio of commercial banks. In this study he has analyzed financial performance and portfolio of commercial banks with ratio analysis, investment portfolio analysis, loans and advances portfolio, risk and return analysis and trend analysis. He concluded that commercial banks are investing considerably higher amount of their fund in government securities. They are investing very low amount of their fund in shares of other companies i.e. less than 1% on average. The banks are providing very high amount of their funds on private sector i.e. more than 82% on average. Joint venture banks are giving second priority to the foreign bills purchase and discount.The beta coefficient of commercial banks has higher than1, the commercial banks have some risky assets. The return of CBs lies above the security market line, which indicates that commercial banks stock, is under price and

accepted. Through the trend of loans and investment and total deposits of CBs are increasing, the percentage change in each year is decreasing. The financial performance of CBs the joint venture banks are found to be performing better than the domestic Nepalese banks operating in the same environment.

Bhandari, (2007). In his thesis "A Study on Impact of Interest Rate Structure on Investment Portfolio of CBs of Nepal". The main objective of his study was to see the impact of interest rate structure on investment portfolio of CBs by analyzing their deposit, loans and advances, interest spread investment and bills purchased and discounted. He has concluded that the deposit rates and lending rates of the CBs have been changing time to time. It is found that the deposit rates and lending rates slightly increased after liberalization of interest rates on august 31, 1989 after that these rates started to decline. CBs investment in government and other securities dramatically increased which is due to lack of proper utilization of collected resources in other sectors. He further found that commercial banks invest a small part of their resources in non fund based areas such as purchase and discount of bills. His recommendation was to attract more deposits, commercial banks offer more incentives and other low yields securities.

Mahat (2008) Conducted research on the topic of "Future prospect of NEPSE in capital mobilization" is able to analyzed situation in Nepal where the industrial sector has very little access to private saving. Also be indicates the availability of industrial securities is nearly absent and the development of financial institutions that link the surplus spending units with the deficit spending ones is in the rudimentary stage.

He further concluded notwithstanding the underdevelopment state of financial institution in the country, growth of invest able funds becoming available recent years. This study also demonstrated the relatively very limited financial contribution of other financial institution to this sector but he does no indicate these factors, which help to uplift the financial contribution to the other sectors like provident fund and NIC etc.

It is acknowledged that a much greater use of resources available in the financial system of the industrial development of the country may not be very smooth and easy. He only specified the growth and potential (measures) of security market, capital market regarding

primary and secondary market. It was absent to show the problems face by the NIDC and other industrial as well as financial sectors. He just shows the preliminary and basic problems of industrial sector but not in broad way. His topic was "future prospects of NEPSE in capital mobilization" but according to the topic the sufficient future prospects/measures are not available in this study but can find thin basic context. There is not indication in the relations of primary and secondary market with economic condition of country in his study. But it is able to give the theoretical version of relationship of capital market with economic growth.

The findings on the term nature of sources and uses of funds and the current ratios of various size and industry groups also do not give any ground for complacency. Some industries were found to have financed a large part of the increase in current assets with the long-term sources of funds, while for others the increase in long-term source was hardly sufficient even to finance the long-term assets formations. He was given high attention to the working capital management in Nepalese industries

Bhandari (2008) studied "Structure and Efficiency of Securities Market Intermediation Service in Nepal". In Nepalese context very few studies have been done by the individual researcher in this topic. He tried to find out the efficiency of securities market intermediation service in Nepalese Securities Market. Major finding of his study are as follows:

- With the elapse of time, there are a lot of changes in structure of intermediaries. The total number of intermediaries is in decreasing trend over his study period and the mixture of market intermediaries are often changing. He considered ten years data for the study.
- Number of listed companies, traded companies, paid-up capital, market capital and NEPSE index are increasing during his study periods, besides some exception. These indicators show the increasing efficiency in comparison with the earlier year.
- Number of permitted brokers during the study periods was decreasing. Some of the brokers hold license only but not submitted financial and transaction reports to NEPSE on time.
- Other sector of Nepalese economy have not moving except capital market in the later days, there is abnormal development in capital market only.

- The high proportion of the investor was not satisfied with issue manager/under writing service available.
- The market makers are not existed from 2002/03 to onwards. The main reason for the failure of the markets was the inability of the market makers to acquire a sufficient buffer stock of shares initially required by them for market making and introduced very initial stage of the security market.
- Overall his study's conclusion is that the structure of the securities market is not well defined as lack of adequate mixture of all typical market. Securities markets intermediation service is inefficient. But, interesting things is that amount and volume of share transaction, paid-up capital, market capitalization, and NEPSE index all are in increasing trends. Nepalese Security market is small in quantity and poor in quality as compared to other develop stock market.

Pandey (2009) Conducted research on the topic of "Public response to Primary Issue of Shares in Nepal," with the objective of: identify the problem s of primary share issue market, assess the growth of primary issue market, analyze the pattern of public response to shares & find the reasons of variation. He has summarized the finding as: Public response in primary market is high due to lack of opportunities for investment in other fields. No proper investment analysis is been made. Despite this, public are attracted towards shares than other sectors, basically to increase their value of investment, be it dividend capital gain or bonus shares. It can be seen that public response to primary issues on Banking and Financial sectors is normally higher than that of the manufacturing and services sector. Major causes for poor response in the period 1995-1998 were; interest rates were higher as compared to dividend yield, the public companies were not performing well and people did not know about the importance of investing securities. Now the response is highly positive because people are aware, money flow in the market is higher, people have seen that most companies are distributing dividends, share prices are increasing for most companies and a lack of better alternatives for investment. Now that the average interest rates have gone down, more can be obtained from investment in stock.

3.8 Research Gap

The purpose of research work is quite different from the studies done by the above persons. This study focuses the effectiveness on Portfolio Management of Listed Companies is NABIL Bank Ltd., ACE Development Bank Ltd., Bishal Bazaar Company Ltd. and Unilever Nepal Ltd. in comprehensive manner considering the major items. The method of analysis is fully different. Financial tools and statistical tools are used in this study as Risk Return analysis and testing of hypothesis. The above research is completely based on the secondary data. Hence, this research is distinct in the sense of presenting secondary data as well as primary data which shows the concise figure of Portfolio Management adopted by the three listed campiness

This Research work is also based on the current directives and circulars issued by NRB regarding Portfolio Management. Also, the study is limited to the numerical data and the numerical values for measuring the Portfolio Management, keeping the thought and intensions away.

This study is done on a listed company (NABIL Bank Ltd., ACE Development Bank Ltd., Bishal Bazaar Company Ltd. and Unilever Nepal Ltd) and has tried to indicate the effectiveness of Portfolio Management of concern listed company.

CHAPTER – III

RESEARCH METHODOLOGY

This chapter describes the methodology employed in the present study. The research methodology consists of research design, data collection procedure, data processing procedures and techniques. Research methodology is a scientific process of finding the solution of the problem through planned and systematic dealing with the collection, analysis and interpretation of fact and figure. Research is a systematic method, which finds out solution to a problem where as research methodology refers to the various sequential steps to adopt by a researcher in studying problems with certain objectives in view. In this study, among various companies listed in NEPSE, four companies are taken as sample. Each sample is taken from different sector. A detail of population and sample will be described in coming sub chapter. The study is more analytical and empirical. It covers quantitative methodology using statistical and financial tools.

3.1 Research Design

A research design 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. Research design is the plan, structure and strategy of investigations conceived so as to obtain answers to research questions and to control variances.

To meet the stated objectives of the study, descriptive cum analytical research design has been adopted. According to which all the historical closing stock prices of the banks, percentage of cash and stock dividend, NEPSE index including the market capitalization of the samples are enumerated. Descriptive research design describes the general pattern of the Nepalese investors, problems of Portfolio management etc. The analytical research design makes analysis of the gathered facts and information and makes a critical evaluation of it. For this, samples are selected to describe the expected returns, risk associated with the stocks and optimal portfolios constructed through the combination of different stocks at different weights. A complete list of the returns, standard deviation of returns, coefficient of variation, covariance, correlation, and beta for the stocks are prepared, utilizing various

tools and techniques. List of information gathered are analyzed and critical evaluation are made.

3.2 Population and Sample

The objective of the research is to explore and describe the portfolio management in different listed companies in NEPSE; it includes four sectors they are Banking, Insurance, Hotel and Manufacturing. This study is based on recent five years historical data. Portfolio is made from the investor's point of view. Therefore, in this study, all listed companies, i.e., 160 till the end of this fiscal year are considered to be the population of the study. However, with regard to the availability of the financial information, four samples were identified purposively from the different sector, the sample represents 2.98 % of the entire population. Apart from this, a random sampling technique has been followed to identify the optimal portfolio from the population by combining stocks of all the four sectors at different weights of investment.

- NABIL Bank Ltd.
- ACE Development Bank Ltd.
- Bishal Bazaar Company Ltd.
- Unilever Nepal Ltd.)

3.3 Nature and Sources of Data

Secondary data has been extensively collected and utilized to accomplish this study. The study, according to the research question, is conducted on the basis of the quantitative data. Further, qualitative data is also collected to enrich the study. To complete the study, a substantial amount of information from secondary sources, i.e., NEPSE, published and unpublished written documents like books, journals, dissertations etc. are collected. Besides this in some case, primary data also used, they are collected through direct interview and observation. For data collection, personal visit on respective organization, bulletin of NRB, and pertinent web sites are used more frequently.

3.4 Tools and Techniques of Analysis

Different tools and techniques were adopted while collecting the data for this study. Collected secondary information was analyzed during the course of the deskwork. However,

during the desk study, an information gap was found. This gap was fulfilled by the discussion with the thesis advisor and finance experts of the security board and the NEPSE.

Information collected from different sources were systematized, arranged in order, and analyzed to serve the objectives. Data processing comprised the activities like tabulating data, avoiding repetition, verification of data, and arranging them in a logical order, which eventually helped during the course of data analysis. Detailed calculations have been carried out to identify the conclusive results; various financial as well as statistical tools are used.

The study has been carried out on the basis of the historical data analyzed from the financial as well as statistical tools.

Single Period Rate of Return (R_j)

Single period return may be defined as the change in value plus any cash distributions expressed as a percentage of the beginning of period investment value. An investor can obtain two kinds of income from an investment in a share of stock. They are

- Income from price appreciation (or losses from price depreciation, also called capital gains (or losses). It is denoted by $P_t - P_{t-1}$
- Cash flow income from cash dividend

Symbolically,

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

where,

R = Actual Rate of Return on Common Stock at time t

P_t = Price of Stock at Time t

P_{t-1} = Price of Stock at Time (t-1)

D_t = Dividend Per Share Including Cash and Stock Dividend

Model for Dividend

D_t = Cash Dividend + Stock Dividend % x Next Year's MPS

Rate of Return of Common Stock [$E(R_j)$]

It is the average of the single period return over the periods.

Symbolically,

$$E(R_j) = \frac{R_j}{N}$$

where,

$E(R_j)$ = Rate of Return on Stock

$\sum R_j$ = Summation of the Annual Return

N = Number of observations (year)

Standard Deviation (σ_j)

It is a measure of dispersion and explains the variability of return around its mean. It is the square root of variance and the value denotes the percentage of risk associated to returns of the stock.

Symbolically,

$$\pm_j \frac{\{R_j \; Z E \int R_j A^2}{N \; Z 1}^{1/2}$$

Coefficient of Variation (CV_j)

Coefficient of Variation can depict the exact position of risk per unit of return. Higher the CV higher the risk and lower the CV lower the risk.

Symbolically,

$$CV_j \; X \frac{\pm_j}{E(R_j)}$$

Covariance (Cov_{ij})

Covariance is a measure of the degree in which two variables "move together" over time. Positive Co-variance between two assets indicates the rate of return tend to move in the same direction. If covariance is negative the rate of return of the assets tend to move in opposite direction and zero value of covariance means there is no relationship between two assets at all.

Symbolically,

$$\text{Covij } X \frac{\{Ri - E(Ri)\}\{Rj - E(Rj)\}}{N - 1}$$

Correlation (ρ_{ij})

It measures the intensity or magnitude of linear relationship between the two variable series. The correlation coefficient will always lie between +1.0 and –1.0.

Symbolically,

$$p_{jj} \; X \frac{cov_{jj}}{\pm_j \pm_j}$$

Beta Coefficient (β)

It is a measure for systematic risk. It gives us the value of slope of the SML.

Symbolically,

$$X \frac{N \quad X Y - \quad X \quad Y}{N \quad Y^2 - (\quad Y)^2}$$

X = Annual Returns of Common Stocks

Y = Return of market

Alpha (α)

It gives the value of y-intercept in SML. It is a measure for unsystematic risk.

Symbolically,

$$\sim X \frac{X}{N} Z \quad \frac{Y}{N}$$

Systematic Risk

It gives us the portion of risk, which cannot be diversified away. It is also called undiversifiable risk.

Symbolically,

Systematic Risk = $\beta^2 \times \sigma^2_m$

or,

Systematic Risk = $\rho^2_{ij} \times \sigma^2_j$

Unsystematic Risk

It gives us the portion of risk, which can be diversified away. It is also called diversifiable risk.

Symbolically,

Unsystematic Risk = Total Risk – Systematic Risk

Coefficient of Determination (ρ^2_{ij})

The coefficient of determination between the two variables series is a measure of linear relationship between them and indicates the amount of one variables series is a measure of linear relationship between them and indicates the amount of one variable which is associates with or accounted for another in the dependent variable that is accounted for by the independent variable. Moreover, it gives the ratio of the explained variance to the total variance and it is given by square of the correlation i.e., $\rho^2_{ij.}$

Symbolically,

$$p^2_{jj} = \frac{\text{Explained Variance}}{\text{Total Variance}} = (\text{Correlation})^2$$

Standard Deviation of Random Error Term

The value of standard deviation of random error term gives us the value of sampling or estimation errors.

Symbolically,

Standard deviation of Random Error Term = $\int X^2 = x \quad X = \frac{x \quad XY}{N = 2}^{1/2}$

Standard Error of Beta

We know that true beta cannot be calculated. It can only be estimated. The standard error helps in identifying the range of true beta. It attempts to indicate the extent of estimation errors in the estimated beta.

Symbolically,

$$\text{Standard Error of Beta} = \frac{\text{Standard deviation of Random Error Term}}{\sum X^2 - \frac{(\sum X)^2}{N}}$$

Standard Error of Alpha

Similarly, the true alpha also cannot be determined. Its value too can only be estimated. Standard error of alpha provides an indication of the magnitude of the possible sampling error that has been made in estimating alpha.

Symbolically,

$$\text{Standard Error of Alpha} = \frac{\text{Standard deviation of Random Error Term}}{N \sum X^2 - \frac{(\sum X)^2}{N}}$$

Investment Performance Evaluation Sharpe's Performance Measure

Investment performance evaluation provides the investor with a solution to select the stocks with high return at low degree of risk.

Sharpe's performance measure defines a single parameter portfolio performance index that is calculated from both the risk and return statistics.

Symbolically,

$$S_p = \frac{Risk\ Premium}{TotalRisk} = \frac{R - R_f}{\pm_j}$$

where,

R = Average Return

R_f = Risk-free Rate of Return

Security Market Line (SML)

It shows relationship between the measure of systematic risk, β, and the required return of an asset. It describes that required return of an asset is a function of the return on the risk-free asset, the risk premium in the market and the asset's beta.

Symbolically,

$R_j = \quad R_f + (R_m - R_f)\,\beta$

where,

R_m = Market Rate of Return

Capital Market Line (CML)

Capital market line represents the market equilibrium trade off between risk and return. CML assists the investors to borrow and lend at the risk less rate, R_f. Further, the CML provides the risk averse investors with opportunities to choose the optimal portfolios from the combinations of the risk less assets and the risky portfolios. Perhaps the most important aspect of the capital market line is that it describes the market price of risk. Market price of risk is the market rate of exchange between risk and return in equilibrium. It is also called market equilibrium price of risk. Market price of risk often spoken as price of risk provides marginal rate of substitution for each investor in his or her rate of exchange between return and risk.

Symbolically,

$$Rp \text{ X } Rf \ \Gamma \frac{Rm \text{ Z } Rf}{\pm_m} \pm_p$$

where,

Rp = Expected Rate of Return for Portfolios along the CML, that is, Combinations of R_f and R_m

σ_m = Standard Deviation of Return on the Market Portfolio

σ_p = Standard Deviation of Portfolios along the CML

$\frac{Rm \text{ Z } Rf}{\pm_m}$ = Slope of CML or Equilibrium Market Price of Risk

Correlation Coefficient

Correlation coefficient helps to find out whether two variables are inter-correlated or not. Correlation coefficient helps to define relationship between these two variables. To be inter-correlated they should fall in between the correlated point. Investing wealth in more than

one security can reduce risk. However, the extent of benefits of portfolio diversification depends on correlation between returns of securities. Correlation coefficient measures the relationship between two assets. The range of correlation varies from +1(perfectly positive) to –1 (perfectly negative). The correlation +1 represents that the portfolio risk cannot be diversified by forming portfolio from these assets and the correlation –1 represents that portfolio risk can be totally diversified if we form the portfolio from such assets. Thus, correlation helps to know whether we can or cannot minimize the risk and to what extent, while forming the portfolio from such assets. To find out correlation coefficient the most widely used application is Karl Pearson's Coefficient of Correlation which is calculated as under:

$$\text{Correlation Coefficient} = \frac{N \quad XY \,\mathrm{Z}(\quad X)(\quad Y)}{\sqrt{N \quad X2 \,\mathrm{Z}(\quad X)2}\sqrt{N \quad Y2 \,\mathrm{Z}(\quad Y)2}}$$

Probable Error

Probable error helps is determining the reliability of the value of Pearson's coefficient of correlation. The process of measuring the reliability is, if 'r' is the calculated correlation coefficient in a sample of 'n' pairs of observation, then its standard error, usually denoted by S.E. is given by:

$$\text{S.E. (r)} = \frac{1 \,\mathrm{Z} r2}{\sqrt{n}}$$

Probable error of the coefficient of correlation can also be calculated form S.E. of the coefficient of correlation. Probable error can be calculated with the help of the following formula:

$$\text{Probable Error (P.E.)} = 0.6745 \ \mid \frac{1 \,\mathrm{Z} r2}{\sqrt{n}}$$

Where r= coefficient of correlation

n= no of observations

The probable error is used to test whether the calculated value of correlation is significant or not.

If r<6* P.E(r), then the value of r is not significant

If r>6* P.E(r), then the value of r is significant

Portfolio Return (Rp)

It is the weighted average returns of the stocks in the portfolio of two or more securities.

Symbolically,

$R_p = w_1R_1 + \ldots\ldots + w_nR_n$

Where,

R_p = Expected return of the portfolio

w_1 = weight of stock 1

R_1 = Expected Return of stock 1

w_n = weight of nth stock

R_n =Expected Return of stock n

Portfolio Standard Deviation (σ_p)

It is the combined standard deviation of the standard deviation of the individual stocks return in the portfolio of two or more securities.

Symbolically,

$\sigma_p = (w^2_1\sigma^2_1+\ldots\ldots+w^2_n\,\sigma^2_n + 2\, w_1\, w_2\, \rho_{12}\, \sigma_1\sigma_2 +\ldots\ldots+2\, w_{n-1}\, w_n\, \rho_{n-1,\,n}\, \sigma_{n-1}\, \sigma_n)^{1/2}$

where,

σ_p = Standard deviation of the portfolio returns of stock 1 to n

σ^2_1 = Variance of returns of stock1

σ^2_n = Variance of returns of nth stock

ρ_{12} = Correlation between returns of stock 1 and stock 2

$\rho_{n-1,\,n}$ = Correlation between returns of stock n-1 and stock n.

CHAPTER – IV

DATA PRESENTATION AND ANALYSIS

This chapter deals with the critical analysis and detailed interpretation of collected data. Most of the data are presented in a tabular form with appropriate figures where necessary. Proper statistical test for inference is also carried out.

Logically, the chapter is divided into three sections: Analysis of secondary data, analysis of primary data and major findings of the study. First the data are summarized and presented in tabulated form and thereafter they are analyzed in terms of risk, return, and coefficient of variance, beta calculation, correlation, covariance, the minimum risk portfolio and test of significance. Moreover, tables, diagrams and charts have been used to depict the information precisely wherever necessary.

This chapter includes the presentation and analysis of quantitative as well as qualitative data and information to achieve the stated objectives of the study.

4.1 Presentation and Analysis of Secondary Data

Analysis of Holding Period Return

Holding period or single rate of return is just change in price of stock with addition of total dividend consisting of cash and stock dividend distributed in current period.

$$HPR \text{ X} \frac{\text{Ending Price - Beginning Price + Dividend}}{\text{Beginning Price}}$$

The summary table below showed five year HPR of four sampled companies stocks. The table and chart below shows the mix trend of HPR.

Table 4.1

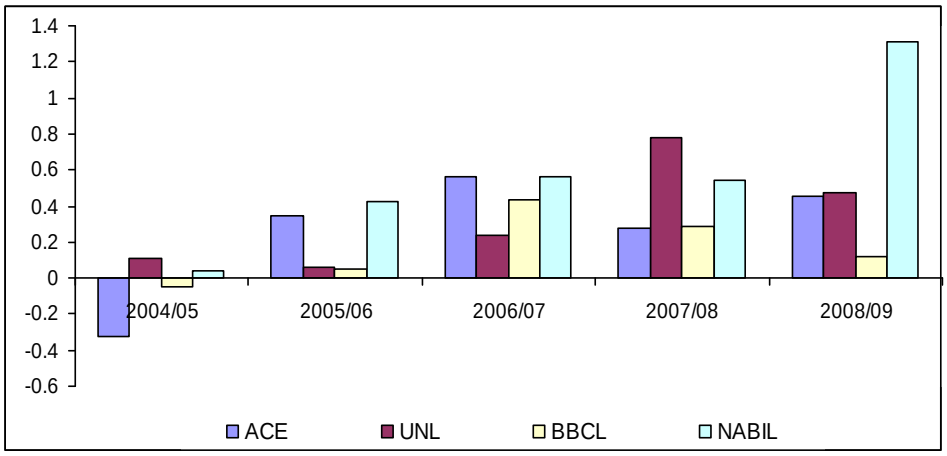
Holding Period Return (HPR)

S.No	Companies	HPR				
		2004/05	2005/06	2006/07	2007/08	2008/09
1	ACE (R_A)	-0.326	0.343	0.566	0.275	0.450
2	UNL (R_U)	0.107	0.060	0.236	0.778	0.470
3	BBCL (R_B)	-0.045	0.050	0.439	0.290	0.115
4	NABIL (R_N)	0.041	0.429	0.565	0.543	1.312

Source: Annual Report of Bank & Company

Figure 4.1

Holding Period Return



The past five years data shows that the holding period return is in mix trend. Two of them from the samples ACE and BBCL have negative return in the year 2004/05. The return of ACE is maximum in the year 2006/07 with 56.6% and minimum in the year 2004/05 with negative return 32.6%. The return of UNL is maximum in the year 2007/08 with 77.8% and minimum in the year 2005/06 with 6%. Similarly, the return of BBCL is maximum in the year 2006/07 with 43.9% and minimum in the year 2004/05 with negative return 4.5%. Likewise, The return of NABIL is maximum in the year 2008/09 with 131.2% and minimum in the year 2004/05 with 4.1%.

Table 4.2

Rate of Return, Variance and Standard Deviation

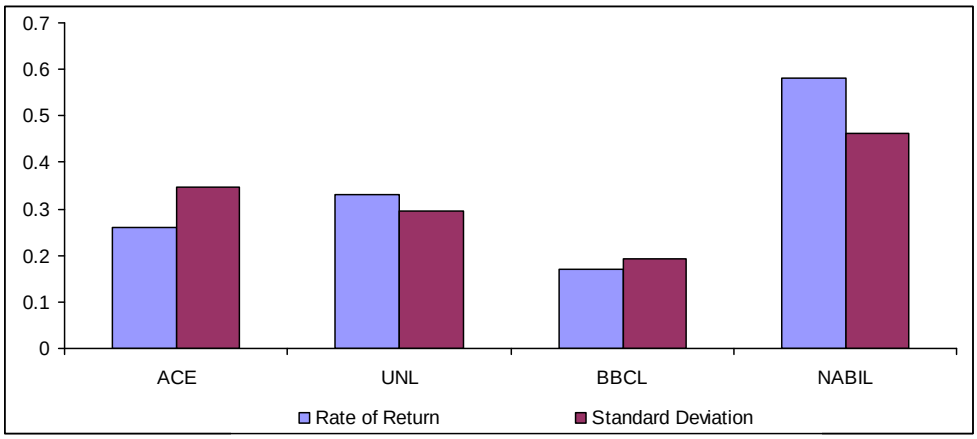
S.No	Stock	Rate of Return (R_j)	Variance (σ^2_j)	Standard Deviation (σ_j)
1	ACE	0.26	0.12	0.347
2	UNL	0.33	0.09	0.296
3	BBCL	0.17	0.038	0.194
4	NABIL	0.58	0.21	0.461

Source: Annual Report of Bank & Company

Rate of return is simply the average of HPR of five years. According to the table2.4, the return realized from stocks of NABIL dominates returns from all other stocks. It means NABIL stock is profitable among the stocks but involves the highest standard deviation i.e. risk. On the Contrary BBCL has the lowest rate of return with lowest standard deviation. This case has followed the universal phenomenon of higher the risk higher the return Risk bearing investor seeking higher profit will invest in NABIL stock and risk averters who are satisfied in current return of the stock will invest in BBCL stock. From the chart below it is clear that risk i.e. Standard deviation is always lower than the rate of return except in the case of ACE Development Bank and BBCL.

Figure 4.2

Return and Risk



4.2 Market Sensitivity Analysis

We have small and growing stock market. Overall market movement is represented by market index (NEPSE Index). The following table shows the market risk and return.

Table 4.3

Risk and Return of Market (NEPSE Index)

Year	NEPSE Index (NI)	R_M	$\overline{R}_M - R_M$	$(R_M - \overline{R}_M)^2$
2003/004	222.02	0		
2003/005	286.67	0.29	-0.03	0.0008
2003/006	386.83	0.35	0.35	0.1221
2003/007	683.95	0.77	0.77	0.5900
2003/008	963.36	0.41	0.41	0.1669
2003/009	749.1	-0.22	-0.22	0.0495
	Total	1.59	**Total**	0.9292
	Mean Return (R_M)	0.32	**Variance (σ^2_M)**	0.01
			S.D (σ_M)	0.32

Figure 4.3

NEPSE Index (NI)

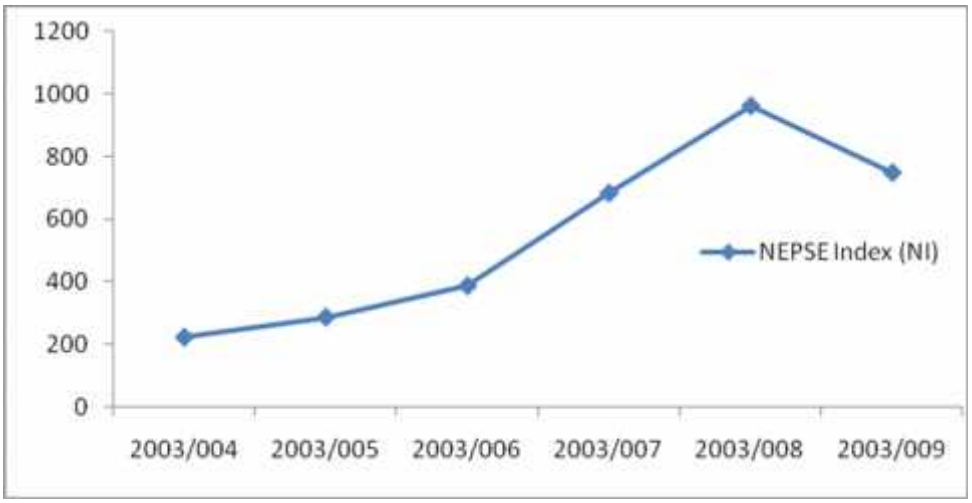
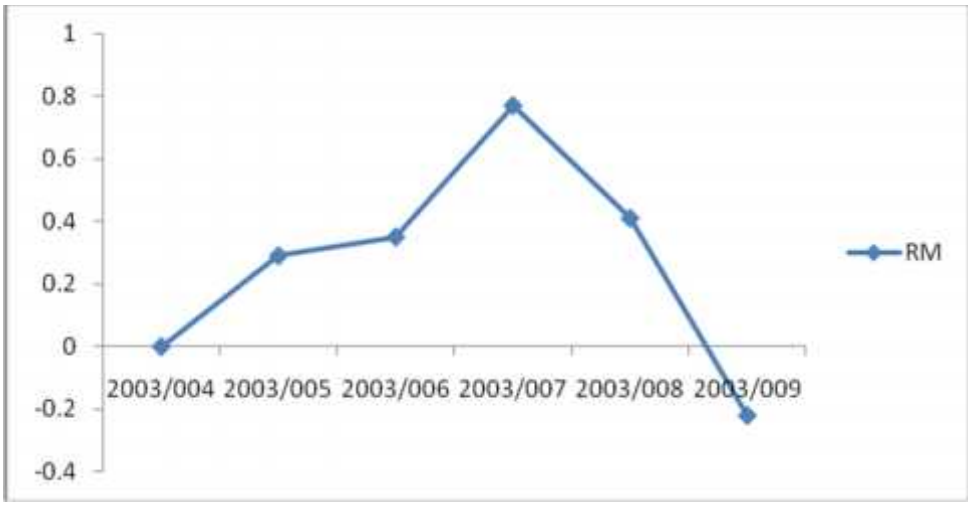


Figure 4.4

Return of Market



The market index indicates that there is no similarity for all years. It is in growing trend and the highest NEPSE index is 963.36 in 2007/2008. From the year 2003/04, the index is in increasing trend & Decrease in 2008/09. The base year of the above market index is 2003 and the base value of market index is 100 started in year 12th February of 1994. The market index is population for this study and it provides significant information regarding market risk and return.

Calculation,

The above figure 4.4 shows the yearly market return. The market experiences the negative market return with 0.22 in the year 2008/2009. The market return is then in increasing trend from 2003/2004 onwards. The market return is relatively higher in the year 2007/08 compared to previous fiscal years.

4.3 Risk Parameters

Forces that contribute to variations in return – price or dividend (interest) - constitute elements of risk. Some influences are external to the firm, cannot be controlled, and affect large numbers of securities. Other influences are internal to the firm and are controllable to a large degree. In investment, those forces that are uncontrollable, external, and board in their effect are called sources of systematic risk. Conversely, controllable, internal factors somewhat peculiar to industries and/or firms are referred to as sources of unsystematic risk. Beta measures systematic/non-diversifiable risk. Beta shows how the price of a security

responds to the market forces. Stocks having betas of less than 1 will be less responsive to changing returns in the market, and therefore are considered defensive stock and vice-versa.

Table 4.4

CV, Covariance, Correlation, Beta and Alpha

S.No	Stock	CV	Covariance	Correlation	Beta (β)	Alpha ($\mathfrak{I}$)
1	ACE	1.33	0.08	0.70	0.71	0.065
2	UNL	0.90	0.06	0.62	0.55	0.177
3	BBCL	1.14	0.03	0.47	0.21	0.112
4	NABIL	0.80	0.15	0.99	1.40	0.195

Source: Annual Report of Bank & Company

Table 4.4 reveals the Coefficient of variation, Covariance, Correlation and Beta. Coefficient of variation reveals risk per unit of return and provides better possible value for risk. Coefficient of variation is used to standardize the risk per unit of return i.e. measure the risk per rupee. ACE stocks possess the highest value of CV with 1.33 that means it has 1.33 unit of risk in 1 rupee return. Thus, ACE stocks are the most risky stock.

Covariance presented in table 4.4 is the covariance of each stocks return with market. Since all values of covariance is positive. It indicates securities' return tend to move in the same direction where the market is moving. Positive covariance implies positive correlation. Therefore, correlation of stocks' return with market is positive in case of all companies.

ACE, UNL and BBCL stocks are expected to possess the volatility less than the market in contrast to the stocks NABIL bank since its beta is higher than 1. They can therefore be termed as defensive assets whereas NABIL stock is expected to possess high volatility than the market and can be termed as aggressive assets. It is also a parameter used for measurement of systematic risk inherent in the stocks. Beta of NABIL is the highest and represents that stocks are 0.40 times (1.40-1) more volatile than the market.

While the value of the alpha representing the y-intercept provides the return of the stocks at zero percentage risk. Alpha of NABIL is the highest in compare to the alpha of other different stocks. It refers to NABIL's expected yearly return as 0.195 (19.5%) when the

market earns nothing. The value is least in the case of ACE Development Bank with 0.065 (6.5%)

4.4 Estimation of True Beta and True Alpha

Security's true historical beta cannot be observed but can be estimated. Thus, even if security's "true" beta remained the same forever, its estimated value, obtained in the manner shown in table 4.5, would still change from time to time because of mistakes (known as sampling errors) in estimating it.

Table 4.5

True Beta and True Alpha

S.No	Stock	SD of Random Error Term	SE of Beta	SE of Alpha	True Beta		True Alpha	
					High	Low	High	Low
1	ACE	0.298	0.4543	0.1567	1.161	0.252	0.222	-0.091
2	UNL	0.271	0.413	0.1425	0.967	0.140	0.319	0.034
3	BBCL	0.210	0.1091	0.1103	0.3184	0.10	0.2220	0.001
4	NABIL	0.1117	0.1704	0.0588	1.5464	1.2056	0.2542	0.137

Source: Annual Report of Bank & Company

Standard error of beta shown in the table 4.5 attempts to indicate the extent of estimation errors. The beta of different stock has confidence range between values presented in the table 6 representing the true values of the beta. However, the chances are roughly two out of three that the 'true' beta a standard error, plus or minus, of the estimated beta. Thus, ACE's beta is likely to be larger than 1.161 and smaller than 0.252, and not exactly 0.71.

As in the case of beta coefficient, the standard error of the alpha provides an indication of the magnitude of the possible sampling error that has been made in estimating alpha.

Table 4.6

Systematic Risk, Unsystematic Risk & Coefficient of Determination

S. No	Stock	Systematic Risk	Unsystematic Risk	Proportion of Systematic Risk	Proportion of Un Systematic Risk	Coefficient of determination ∂^2_{ij}
1	ACE	0.054	0.066	0.454	0.546	0.49
2	UNL	0.033	0.055	0.371	0.629	0.38
3	BBCL	0.005	0.033	0.125	0.875	0.22
4	NABIL	0.212	0.001	0.994	0.006	0.98

Source: Annual Report of Bank & Company

Similarly the table also gives us the portion of systematic risk and unsystematic risk in the total risk, i.e., variance. The stocks of ACE, UNL, BBCL and NABIL have the systematic risk of 5.4%, 3.3%, 0.5% and 21.2% respectively. Comparing with each other NABIL has the highest systematic risk where as the stock of Bishal Bazar Limited posses the nominal amount of systematic risk with 0.5%. The result shows that the BBCL stock price is not affected by market factors. Changes in economic, political and sociological and other relevant factors in environment don't affect the securities of BBCL. On the basis of systematic risk, the stock of BBCL is the most attractive than others.

Out of total risk of individual stock's return, the proportion of systematic risks of ACE, UNL, BBCL and NABIL are 45.4%, 37.1%, 12.5% and 99.4% respectively. It means that 45.4% variability of returns of the common stocks of ACE development bank is systematic or caused by market factors. The NABIL bank has the highest systematic risk with 99.4% which means the returns of the stock of NABIL is highly influenced by the external factors and environmental factors and can't be diversified at all. Creating portfolio can't minimize the NABIL stocks' risk. Therefore, the investors need to consider the market forces and other relevant forces that affect the market while investing in NABIL stock. Among all the stock of BBCL has the lowest portion of systematic risk in total risk with only 12.5%. The investors will be in safe position in regarding with the risk generated by the market forces in case of BBCL.

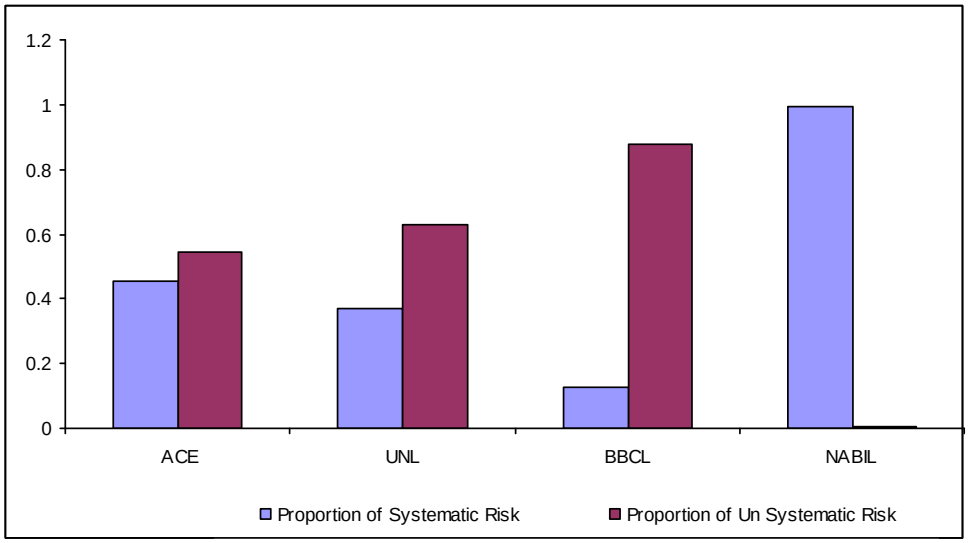
Considering the unsystematic risks, the BBCL has the highest degree of unsystematic risk among all. 87.5% represents the portion of unsystematic risk out of total risk. 87.5 % risk

out of total risk can be diversified by creating the optimal portfolio i.e. 87.5% of risk can be controlled by the rationale investors. Among the samples, NABIL stocks unsystematic risk is nominal and can't be minimized by the investors in any way. Likewise, 54.6% of ACE and 62.9% of UNL risk can be diversified away from total risk.

Coefficient of determination computed in the table 4.6 shows how much of the movements in the samples' returns are explained by movements in the returns on index. With the value of 0.49, it can be explained that 49% of the movements in the return on ACE during the five-year is attributed to movements in the return on the market. While 51% (1-0.49=0.51) of the movements in the stocks cannot be attributed to movement in the market. Therefore, 51% of the risk can be diversified away with optimal portfolio construction. The highest coefficient of determination value of NABIL 98% indicates that the movement in the return on NABIL during the five-year s attributed to movements in the return on the market. The investors haven't control over the stocks of NABIL.

Figure 4.5

Proportion of Stock



4.5 Correlation Analysis

By the term statistical analysis the focus is on the application of various statistical tools to develop the relationship between various variables from profit and loss account, balance sheet, cash flow statement and other documents if necessary. It shows the quantitative

aspects of various figures and tries to develop a relationship between these figures. The main tools that are used for statistical analysis are outlined below:-

A) Correlation Coefficient of returns of Stocks between ACE and UNL

r	r^2	P.E	6P.E	Remarks
02733	0.0747	0.2791	1.6747	Not Significant

The above calculation of correlation of the stocks shows positive correlation between ACE and UNL indicating that the risk can't be fully diversified away by combining assets and creating optimum portfolio. It can be observed that if the return of the stock of ACE increases then the return of the stock of UNL also increases. Accordingly if the risk of stock of ACE increases then the risk of the stock of UNL also increases which means that the changes in return and risk of the stocks move in same direction. The value of r^2 of 7.47% suggest that it depends upon the risk that can be observed in the return of the stocks taken under calculation and rest all depends upon unknown factor concerned with the return of the stocks in the security stock market.

B) Correlation Coefficient of returns of Stocks between BBCL and ACE

r	r^2	P.E	6P.E	Remarks
0.6940	0.4816	0.1564	0.9384	Not Significant

The above calculation of correlation of the stocks shows positive correlation between BBCL and ACE indicating that the risk can't be fully diversified away by combining assets and creating optimum portfolio. It can be observed that if the return of the stock of BBCL increases then the return of the stock of ACE also increases. Accordingly if the risk of stock of BBCL increases then the risk of the stock of ACE also increases which means that the changes in return and risk of the stocks move in same direction. The value of r^2 of 48.16% suggest that it depends upon the risk that can be observed in the return of the stocks taken under calculation and rest all depends upon unknown factor concerned with the return of the stocks in the security stock market

C) Correlation Coefficient of returns of Stocks between ACE and NABIL

r	r^2	P.E	6P.E	Remarks
0.6910	0.4775	0.1576	0.9456	Not Significant

The above calculation of correlation of the stocks shows positive correlation between ACE and NABIL indicating that the risk can't be fully diversified away by combining assets and creating optimum portfolio. It can be observed that if the return of the stock of ACE increases then the return of the stock of NABIL also increases. Accordingly if the risk of stock of ACE increases then the risk of the stock of NABIL also increases which means that the changes in return and risk of the stocks move in same direction. The value of r^2 of 47.75% suggest that it depends upon the risk that can be observed in the return of the stocks taken under calculation and rest all depends upon unknown factor concerned with the return of the stocks in the security stock market

D) Correlation Coefficient of returns of Stocks between BBCL and UNL

r	r^2	P.E	6P.E	Remarks
0.4410	0.1945	0.2430	1.4580	Not Significant

The above calculation of correlation of the stocks shows positive correlation between BBCL and UNL indicating that the risk can't be fully diversified away by combining assets and creating optimum portfolio. It can be observed that if the return of the stock of BBCL increases then the return of the stock of UNL also increases. Accordingly if the risk of stock of BBCL increases then the risk of the stock of UNL also increases which means that the changes in return and risk of the stocks move in same direction. The value of r^2 of 19.45% suggest that it depends upon the risk that can be observed in the return of the stocks taken under calculation and rest all depends upon unknown factor concerned with the return of the stocks in the security stock market

E) Correlation Coefficient of returns of Stocks between UNL and NABIL

r	r^2	P.E	6P.E	Remarks
0.4560	0.2079	0.2389	1.4334	Not Significant

The above calculation of correlation of the stocks shows positive correlation between UNL and NABIL indicating that the risk can't be fully diversified away by combining assets and creating optimum portfolio. It can be observed that if the return of the stock of UNL increases then the return of the stock of NABIL also increases. Accordingly if the risk of stock of UNL increases then the risk of the stock of NABIL also increases which means that the changes in return and risk of the stocks move in same direction. The value of r^2 of 20.7 9% suggest that it depends upon the risk that can be observed in the return of the stocks taken under calculation and rest all depends upon unknown factor concerned with the return of the stocks in the security stock market

F) Correlation Coefficient of returns of Stocks between BBCL and NABIL

r	r^2	P.E	6P.E	Remarks
0.2477	0.0614	0.2832	1.6988	Not Significant

The above calculation of correlation of the stocks shows positive correlation between BBCL and NABIL indicating that the risk can't be fully diversified away by combining assets and creating optimum portfolio. It can be observed that if the return of the stock of BBCL increases then the return of the stock of NABIL also increases. Accordingly if the risk of stock of BBCL increases then the risk of the stock of NABIL also increases which means that the changes in return and risk of the stocks move in same direction. The value of r^2 of 6.14% suggest that it depends upon the risk that can be observed in the return of the stocks taken under calculation and rest all depends upon unknown factor concerned with the return of the stocks in the security stock market

4.5.1 Price Situations of the Sample Companies

The required rate of return is the minimum rate of return that an investor expects from his/her investment is risky assets. It is the function of real rate of return and systematic risk. The required rate of return is the return on risk free assets i.e. government securities plus risk premium. It is determined by CAPM/SML method.

4.5.2 Security Market Line (SML)

Security market line helps distinguish whether the stocks are overpriced or under priced. It shows relationship between the measures of systematic risk, $\beta_{j,}$ and the required return, R_j,

of an asset. The line slopes upward originating from Y-axis, generally higher than the value of origin and confirms that investors are risk averse: the higher the risk (*βj*), the higher the required return. The greater the beta of a security, greater will be the systematic risk and the greater the required return and vice versa.

The SML equation is developed as

$$Rj = Rf + (Rm - Rf)\,\beta_j$$
$$= 0.0386 + (0.28 - 0.0386)\,\beta_j$$
$$= 0.0386 + 0.2414\,\beta_j$$

where,

Rj = Required Rate of Return

Rf = Risk Free Rate of Return

The beta coefficient, risk premium and required rate of return on the stocks of sample companies have been summarized in table 4.8.

Table 4.7

Evaluation of Stock Price

Stocks	β_j	R_f	R_m	Risk premium (R_m- R_f)	Required rate of return	Mean return	Evaluation
ACE	0.71	0.0386	0.28	0.2414	0.210	0.26	Underpriced
UNL	0.55	0.0386	0.28	0.2414	0.171	0.33	Underpriced
BBCL	0.21	0.0386	0.28	0.2414	0.089	0.17	Underpriced
NABIL	1.4	0.0386	0.28	0.2414	0.377	0.58	Underpriced

Source: Annual Report of Bank & Company

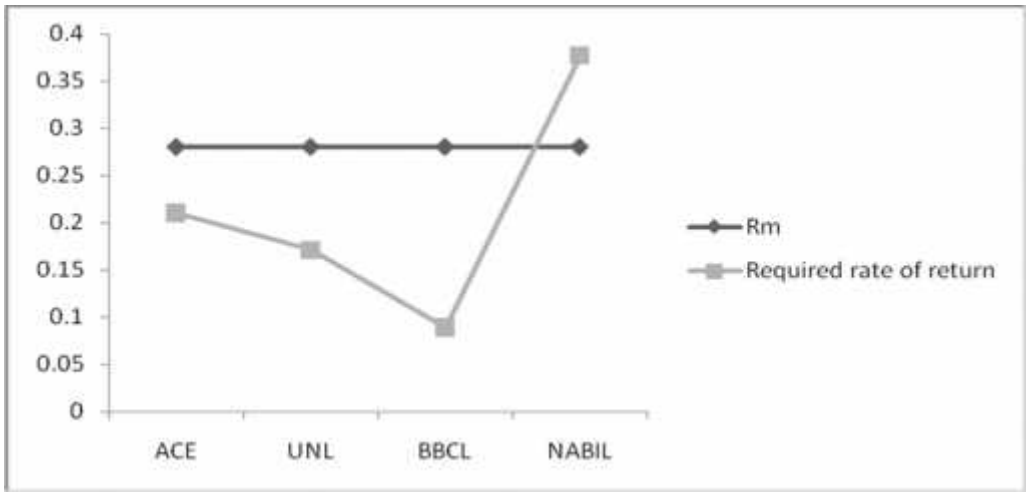
Table 4.8 shows the positive relationship between the risk and the return indicating higher the tolerance for risk, higher is the return and vice versa. Criteria for rating the securities overpriced and under priced are defined by the CAPM.

From table 4.7, it has been observed that the overall average market return is 28%. The 91-Treasury bill rate or risk free rate is 3.86%. The risk premium for the stocks of all the companies in the market is the difference between risk free rate and market rate of return i.e. 24.14%. Based on the risky ness of the stocks, NABIL has the highest required rate of return among all i.e. 37.7%. Its required rate of return is highest because of highest beta

among sample securities. Analyzing the table, all the stocks are under priced. The stock of all the companies given in the above table appears attractive to investors. Hence, investors are advised to take long position to gain i.e. to purchase the shares of these companies.

Figure 4.6

Security of Market



4.5.3 Capital Market Line (CML)

CML assists in identifying the efficient portfolio that is perfectly correlated with the market portfolio since they all fall on the CML.

Table 4.8

Capital Market Line

Stocks	R_f	$\frac{R_m Z R_f}{\pm_m}$	σj	Required return (Rj)
ACE	0.0386	0.7349	0.347	0.2684
UNL	0.0386	0.7349	0.296	0.2290
BBCL	0.0386	0.7349	0.194	0.1501
NABIL	0.0386	0.7349	0.461	0.3566

From the use of CML, the required return only for those efficient portfolios that are perfectly correlated with the market portfolio can be determined since they fall on the CML. CML provides the highest expected return for each level of risk and represents the market equilibrium trade off between risk and return. It assists investors to borrow and lend at the

risk less rate, R_f. Thus in equilibrium, all risk-averse investors will choose their optimal portfolios from combinations of the risk less asset and the risky portfolio.

The most important aspect of the Capital Market Line is that it describes the market price of risk or risk premium, which is used by all individuals who make decisions in the face of uncertainty. Risk premium in the present study has been identified as 0.2414

4.5.4 Portfolio Analysis

The objective of portfolio analysis is to develop a portfolio that has the maximum return at whatever level of risk the investor deems appropriate. Because a portfolio is a collection of securities the optimal portfolio has been selected from a set of possible portfolios. For this purpose different sets have been created and different weights have been assigned to them.

Portfolio Return (R_p) = $X_1R_1+X_2R_2$ …… Two Asset case

Portfolio Return (R_p) – $X_1R_1+X_2R_2+X_3R_3$……..Three Asset case

Here, X_1, X_2, X_3 Portfolio Return (R_p) represent the investment proportion in asset 1,2 and 3 respectively. Likewise, R1, R_2, R_3 represent the return of assets 1,2 and 3 respectively.

4.6 Portfolio Construction

In this section, the portfolio is constructed by using varying level of weight or proportion including optimal portfolio weight. The portfolio construction is based on two assets and three-portfolio model. For this purpose different set is formed and within the sets group is formed from A to K. The portfolio is constructed with by assigning different weights to individual stock. The efficient frontier curve is based on best portfolio among the group.

Table 4.9

Portfolios between ACE and UNL (Set 1)

Portfolios	**W1**	**W2**	**R_P**	**σ_p**	**CV**
A	0	1	0.33	0.296	0.897
B	0.1	0.9	0.323	0.278	0.8604
C	0.2	0.8	0.316	0.264	0.8365
D	0.3	0.7	0.309	0.256	0.8286
E	0.4	0.6	0.302	0.254	0.8395
F	0.5	0.5	0.295	0.257	0.8711
G	0.6	0.4	0.288	0.266	0.9242
H	0.7	0.3	0.281	0.280	0.9982
I	0.8	0.2	0.274	0.299	1.0921
J	0.9	0.1	0.267	0.322	1.2047
K	1	0	0.26	0.347	1.3346

Source: Annual Report of Bank & Company

From group A to K the optimal portfolio that is positive and concave is selected as best portfolio.

From the different portfolios formed with ACE and UNL shown in table 4.10, the highest portfolio return is derived from portfolio A and the least portfolio risk is derived from portfolio E. However, the total risk can be significantly reduced with a well-diversified portfolio. The different combination with different weight provides varying level of return and risk but there is no such big difference in return and risk. The portfolio K provides the least level of return; highest level of risk and highest CV i.e. the risk per unit of return. The CV is the highest where there is 100% investment in ACE stock. It reveals that the investors are advised to invest in greater portion in UNL stock to generate higher return. The high-risk taker investor will invest in portfolio, A which provides the highest return of 33%. Among portfolios, portfolio E i.e. 40% in ACE stock and 60% in UNL stock is the minimum variance portfolio.

Figure 4.7

Portfolios between ACE & UNL

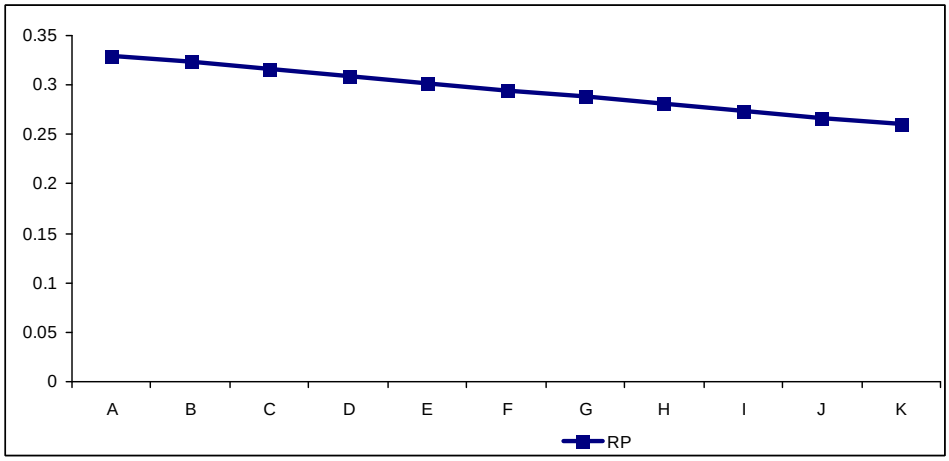


Table 4.10

Portfolios between ACE and BBCL (Set 2)

	W_1	W_2	R_P	σ_p	CV
A	0	1	0.17	0.194	1.1412
B	0.1	0.9	0.179	0.200	1.1187
C	0.2	0.8	0.188	0.209	1.1139
D	0.3	0.7	0.197	0.221	1.1225
E	0.4	0.6	0.206	0.235	1.1409
F	0.5	0.5	0.215	0.251	1.1662
G	0.6	0.4	0.224	0.268	1.1962
H	0.7	0.3	0.233	0.286	1.2291
I	0.8	0.2	0.242	0.306	1.2637
J	0.9	0.1	0.251	0.326	1.2991
K	1	0	0.26	0.347	1.3346

Source: Annual Report of Bank & Company

From the different portfolios formed with ACE and BBCL shown in table 4.11, the highest portfolio return is derived from portfolio K with highest level of standard deviation and the highest level of CV. The least portfolio risk is derived from portfolio A. However, the total risk can be significantly reduced with a well-diversified portfolio. The different combination with different weight provides varying level of return and risk but there is no such big difference in return and risk. The CV is the highest where there is 100%

investment in ACE stock. It reveals that the investors are advised to invest in greater portion in ACE stock to generate higher return. The high-risk taker investor will invest in portfolio, K that provides the highest return of 26%. Among portfolios, portfolio A i.e. 0% in ACE stock and 100% in BBCL stock is the minimum variance portfolio.

Figure 4.8

Portfolios between ACE and BBCL

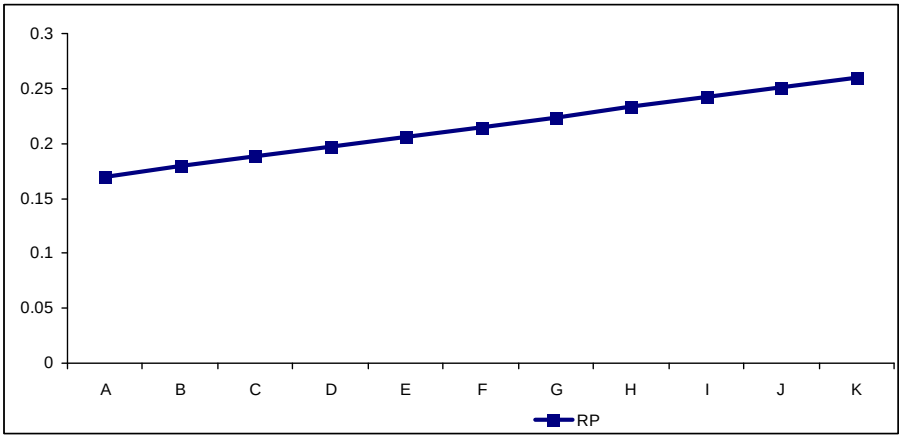


Table 4.11

Portfolios between ACE and NABIL (Set 3)

Portfolios	W_1	W_2	R_P	σ_p	CV
A	0	1	0.58	0.461	0.795
B	0.1	0.9	0.548	0.440	0.802
C	0.2	0.8	0.516	0.420	0.813
D	0.3	0.7	0.484	0.402	0.830
E	0.4	0.6	0.452	0.386	0.854
F	0.5	0.5	0.42	0.372	0.886
G	0.6	0.4	0.388	0.361	0.931
H	0.7	0.3	0.356	0.353	0.991
I	0.8	0.2	0.324	0.348	1.073
J	0.9	0.1	0.292	0.346	1.184
K	1	0	0.26	0.347	1.335

Source: Annual Report of Bank & Company

From the different portfolios formed with ACE and NABIL shown in table 4.12, the highest portfolio return is derived from portfolio A and the least portfolio risk is derived from portfolio J. However, the total risk can be significantly reduced with a well-diversified portfolio. The different combination with different weight provides varying level of return

and risk but there is no such big difference in return and risk. The portfolio K provides the least level of return and highest CV i.e. the risk per unit of return. The CV is the highest where there is 100% investment in ACE stock. It reveals that the investors are advised to invest in greater portion in NABIL stock to generate higher return. The high-risk taker investor will invest in portfolio, A which provides the highest return of 58%. Among portfolios, portfolio J i.e. 90% in ACE stock and 10% in NABIL stock is the minimum variance portfolio.

Figure 4.9

ACE and NABIL

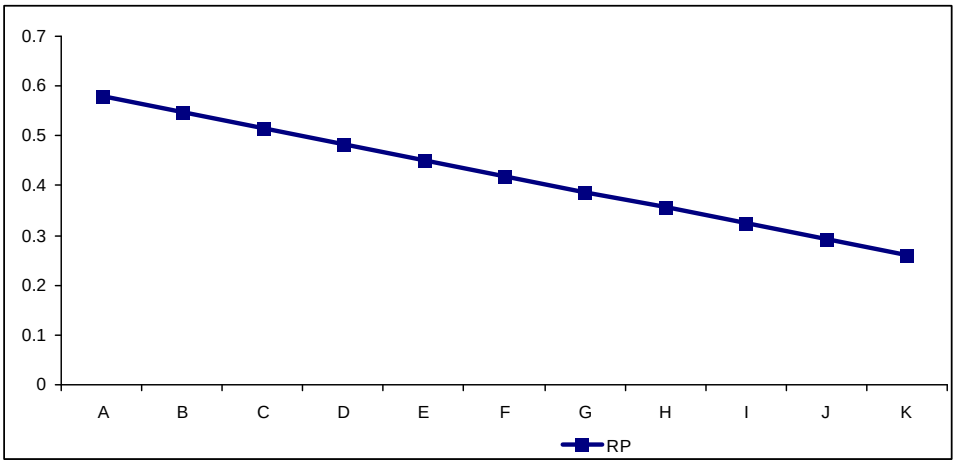


Table 4.12

Portfolios between UNL and BBCL (Set 4)

Portfolios	W_1	W_2	R_P	σ_p	CV
A	0	1	0.170	0.194	1.141
B	0.1	0.9	0.186	0.190	1.019
C	0.2	0.8	0.202	0.189	0.935
D	0.3	0.7	0.218	0.192	0.882
E	0.4	0.6	0.234	0.199	0.852
F	0.5	0.5	0.250	0.210	0.839
G	0.6	0.4	0.266	0.223	0.838
H	0.7	0.3	0.282	0.239	0.846
I	0.8	0.2	0.298	0.256	0.860
J	0.9	0.1	0.314	0.276	0.877
K	1	0	0.330	0.296	0.897

Source: Annual Report of Bank & Company

From the different portfolios formed with UNL and BBCL shown in table 4.13, the highest portfolio return is derived from portfolio K and the least portfolio risk is derived from

portfolio C. However, the total risk can be significantly reduced with a well-diversified portfolio. The different combination with different weight provides varying level of return and risk but there is no such big difference in return and risk. The portfolio A provides the least level of return and highest CV i.e. the risk per unit of return. The CV is the highest where there is 100% investment in BBCL stock. It reveals that the investors are advised to invest in greater portion in UNL stock to generate higher return. The high-risk taker investor will invest in portfolio, K that provides the highest return of 33%. Among portfolios, portfolio C i.e. 20% in UNL stock and 80% in BBCL stock is the minimum variance portfolio.

Figure: 4.10

Portfolios between UNL and BBCL

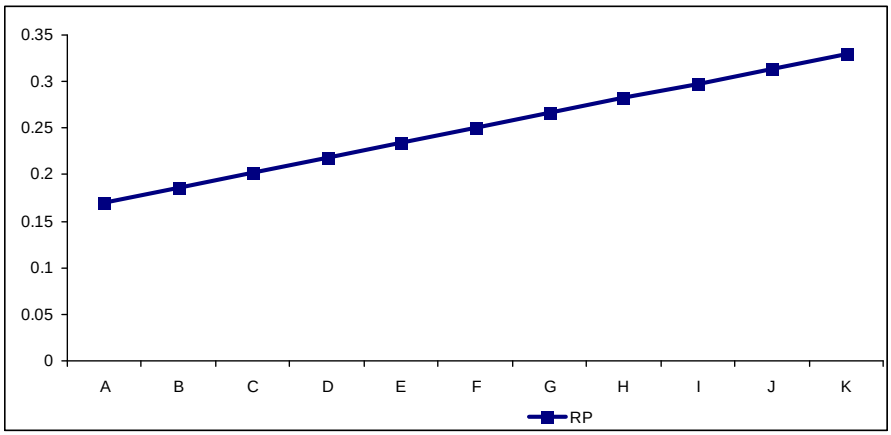


Table 4.13

Portfolios between UNL and NABIL (Set 5)

Portfolios	W_1	W_2	R_P	σ_p	CV
A	0	1	0.580	0.461	0.795
B	0.1	0.9	0.555	0.429	0.773
C	0.2	0.8	0.530	0.399	0.753
D	0.3	0.7	0.505	0.372	0.736
E	0.4	0.6	0.480	0.347	0.723
F	0.5	0.5	0.455	0.326	0.716
G	0.6	0.4	0.430	0.309	0.718
H	0.7	0.3	0.405	0.297	0.733
I	0.8	0.2	0.380	0.291	0.765
J	0.9	0.1	0.355	0.290	0.818
K	1	0	0.330	0.296	0.897

Source: Annual Report of Bank & Company

From the different portfolios formed with UNL and NABIL shown in table 4.14, the highest portfolio return is derived from portfolio A and the least portfolio risk is derived from portfolio J. However, the total risk can be significantly reduced with a well-diversified portfolio. The different combination with different weight provides varying level of return and risk but there is no such big difference in return and risk. The portfolio K provides the least level of return and highest CV i.e. the risk per unit of return. The CV is the highest where there is 100% investment in UNL stock. It reveals that the investors are advised to invest in greater portion in NABIL stock to generate higher return. The high-risk taker investor will invest in portfolio, A which provides the highest return of 58%. Among portfolios, portfolio J i.e. 90% in UNL stock and 10% in NABIL stock is the minimum variance portfolio.

Figure 4.11

UNL and NABIL

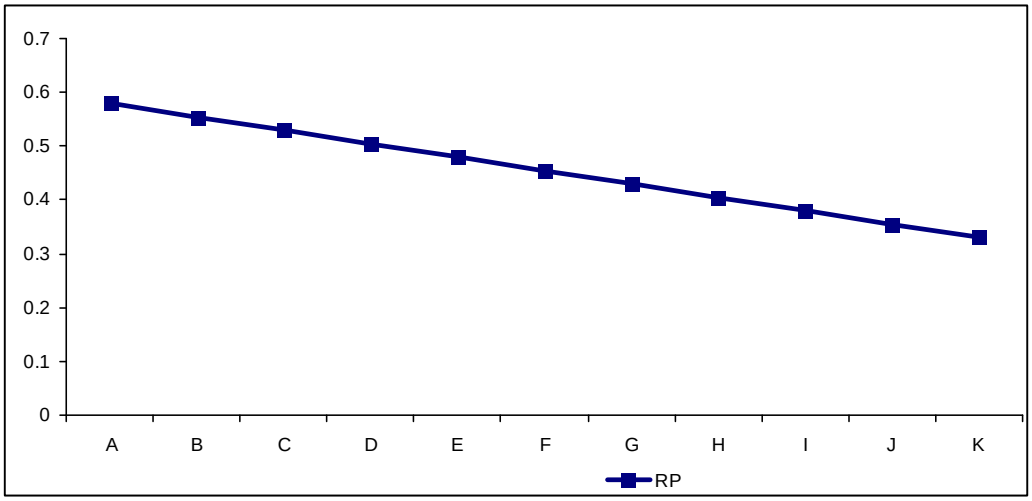


Table 4.14

Portfolios between BBCL and NABIL (Set 6)

	W_1	W_2	R_P	σ_p	CV
A	0	1	0.58	0.461	0.795
B	0.1	0.9	0.539	0.420	0.779
C	0.2	0.8	0.498	0.380	0.764
D	0.3	0.7	0.457	0.342	0.748
E	0.4	0.6	0.416	0.305	0.734
F	0.5	0.5	0.375	0.271	0.724
G	0.6	0.4	0.334	0.241	0.722
H	0.7	0.3	0.293	0.217	0.739
I	0.8	0.2	0.252	0.199	0.790
J	0.9	0.1	0.211	0.191	0.907
K	1	0	0.17	0.194	1.141

Source: Annual Report of Bank & Company

From the different portfolios formed with BBCL and NABIL shown in table 4.15, the highest portfolio return is derived from portfolio A and the least portfolio risk is derived from portfolio J. However, the total risk can be significantly reduced with a well-diversified portfolio. The different combination with different weight provides varying level of return and risk but there is no such big difference in return and risk. The portfolio K provides the least level of return and highest CV i.e. the risk per unit of return. The CV is the highest where there is 100% investment in BBCL stock. It reveals that the investors are advised to invest in greater portion in NABIL stock to generate higher return. The high-risk taker investor will invest in portfolio, A which provides the highest return of 58%. Among portfolios, portfolio J i.e. 90% in BBCL stock and 10% in NABIL stock is the minimum variance portfolio.

Figure 4.12

BBCL & NABIL

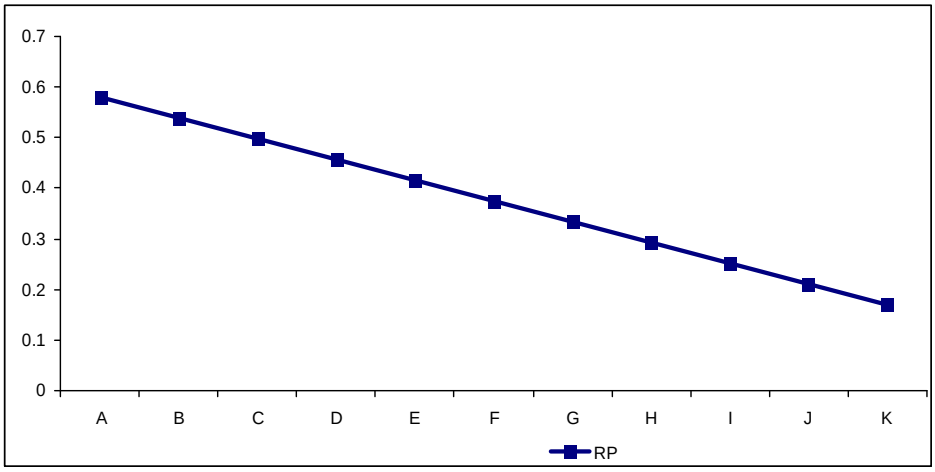


Table 4.15

Portfolios between ACE, BBCL and NABIL (Set 7)

Portfolios	W_1	W_2	W_3	R_P	σ_p	CV
A	0.1	0.1	0.8	0.507	0.400	0.788
B	0.2	0.1	0.7	0.475	0.381	0.802
C	0.3	0.1	0.6	0.443	0.365	0.823
D	0.4	0.1	0.5	0.411	0.351	0.853
E	0.5	0.1	0.4	0.379	0.339	0.895
F	0.6	0.1	0.3	0.347	0.331	0.954
G	0.7	0.1	0.2	0.315	0.326	1.035
H	0.8	0.1	0.1	0.283	0.324	1.146
I	0.1	0.2	0.7	0.466	0.361	0.775
J	0.1	0.3	0.6	0.425	0.324	0.763
K	0.1	0.4	0.5	0.384	0.290	0.755
L	0.1	0.5	0.4	0.343	0.259	0.755
M	0.1	0.6	0.3	0.302	0.233	0.770
N	0.1	0.7	0.2	0.261	0.213	0.816
O	0.1	0.8	0.1	0.22	0.202	0.916
P	0.7	0.2	0.1	0.274	0.303	1.107
Q	0.6	0.3	0.1	0.265	0.283	1.069
R	0.5	0.4	0.1	0.256	0.264	1.032
S	0.4	0.5	0.1	0.247	0.246	0.996
T	0.3	0.6	0.1	0.238	0.229	0.964
U	0.2	0.7	0.1	0.229	0.214	0.936

Source: Annual Report of Bank & Company

From the different portfolios formed with ACE, BBCL and NABIL shown in table 4.16, the highest portfolio return is derived from portfolio A and the least portfolio risk is derived from portfolio O with standard deviation 0.202. However, the total risk can be significantly reduced with a well-diversified portfolio. The different combination with different weight provides varying level of return and risk but there is no such big difference in return and risk. The portfolio O provides the least level of return of 22%. The portfolio H provides the highest CV where there is 80% investment in ACE stock, 10% in BBCL and 10% in NABIL stock. It reveals that the investors are advised to invest in greater portion in NABIL stock to generate higher return. The high-risk taker investor will invest in portfolio, A which provides the highest return of 50.7%. Among portfolios, portfolios O i.e. 10% in ACE stock, 80% in BBCL and 10% in NABIL stock is the minimum variance portfolio.

Figure: 4.13

ACE, BBCL and NABIL

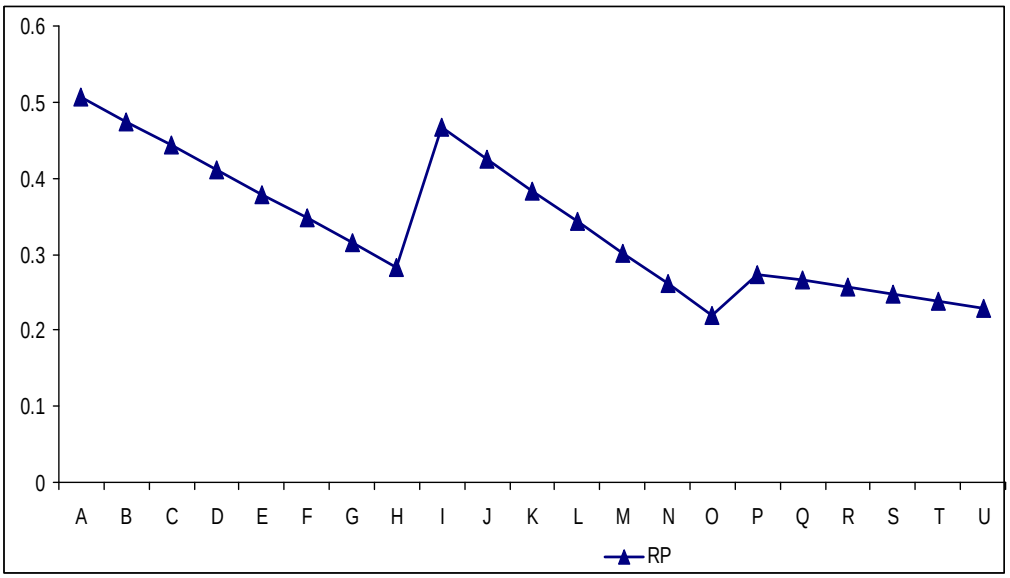


Table 4.16

Portfolios between ACE, UNL and BBCL (Set 8)

Portfolios	W_1	W_2	W_3	R_P	σ_p	CV
A	0.1	0.1	0.8	0.195	0.196	1.003
B	0.2	0.1	0.7	0.204	0.205	1.003
C	0.3	0.1	0.6	0.213	0.216	1.016
D	0.4	0.1	0.5	0.222	0.230	1.037
E	0.5	0.1	0.4	0.231	0.246	1.065
F	0.6	0.1	0.3	0.240	0.263	1.097
G	0.7	0.1	0.2	0.249	0.282	1.132
H	0.8	0.1	0.1	0.258	0.301	1.168
I	0.1	0.2	0.7	0.211	0.195	0.923
J	0.1	0.3	0.6	0.227	0.198	0.870
K	0.1	0.4	0.5	0.243	0.204	0.840
L	0.1	0.5	0.4	0.259	0.214	0.826
M	0.1	0.6	0.3	0.275	0.227	0.825
N	0.1	0.7	0.2	0.291	0.242	0.831
O	0.1	0.8	0.1	0.307	0.259	0.844
P	0.7	0.2	0.1	0.265	0.280	1.056
Q	0.6	0.3	0.1	0.272	0.262	0.965
R	0.5	0.4	0.1	0.279	0.250	0.896
S	0.4	0.5	0.1	0.286	0.243	0.850
T	0.3	0.6	0.1	0.293	0.242	0.827
U	0.2	0.7	0.1	0.300	0.248	0.826

Source: Annual Report of Bank & Company

From the different portfolios formed with ACE, UNL and BBCL shown in table 4.17, the highest portfolio return is derived from portfolio O and the least portfolio risk is derived from portfolio I with standard deviation 0.195. However, the total risk can be significantly reduced with a well-diversified portfolio. The different combination with different weight provides varying level of return and risk but there is no such big difference in return and risk. The portfolio A provides the least level of return of 19.5%. The portfolio H provides the highest CV where there is 80% investment in ACE stock, 10% in UNL and 10% in BBCL stock. It reveals that the investors are advised to invest in greater portion in UNL stock to generate higher return. The high-risk taker investor will invest in portfolio, O that provides the highest return of 30.7%. Among portfolios, portfolios I i.e. 10% in ACE stock, 20% in UNL and 70% in BBCL stock is the minimum variance portfolio.

Figure 4.14

ACE, UNL and BBCL

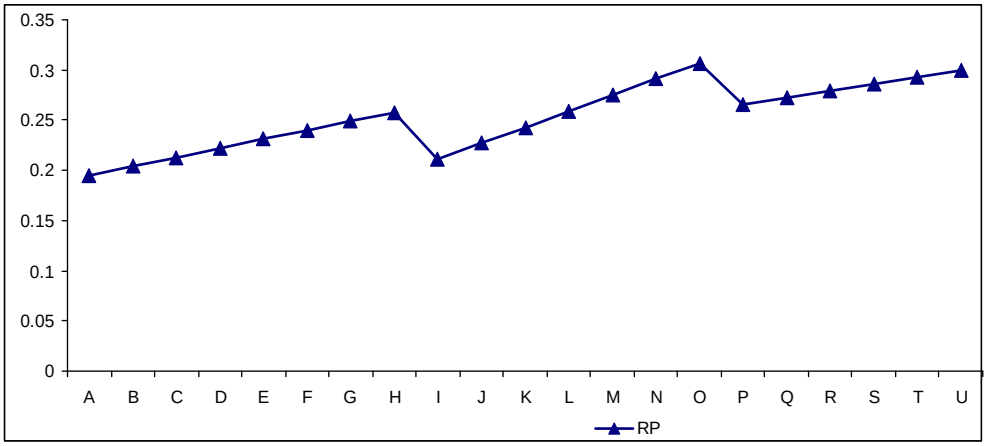


Table 4.17

Portfolios between ACE, UNL and NABIL (Set 9)

	W_1	W_2	W_3	R_P	σ_p	CV
A	0.1	0.1	0.8	0.523	0.408	0.780
B	0.2	0.1	0.7	0.491	0.388	0.790
C	0.3	0.1	0.6	0.459	0.370	0.807
D	0.4	0.1	0.5	0.427	0.355	0.831
E	0.5	0.1	0.4	0.395	0.342	0.866
F	0.6	0.1	0.3	0.363	0.332	0.915
G	0.7	0.1	0.2	0.331	0.325	0.982
H	0.8	0.1	0.1	0.299	0.322	1.076
I	0.1	0.2	0.7	0.498	0.378	0.759
J	0.1	0.3	0.6	0.473	0.351	0.741
K	0.1	0.4	0.5	0.448	0.326	0.729
L	0.1	0.5	0.4	0.423	0.306	0.723
M	0.1	0.6	0.3	0.398	0.290	0.729
N	0.1	0.7	0.2	0.373	0.280	0.751
O	0.1	0.8	0.1	0.348	0.276	0.793
P	0.7	0.2	0.1	0.306	0.301	0.983
Q	0.6	0.3	0.1	0.313	0.284	0.906
R	0.5	0.4	0.1	0.32	0.271	0.847
S	0.4	0.5	0.1	0.327	0.264	0.807
T	0.3	0.6	0.1	0.334	0.262	0.785
U	0.2	0.7	0.1	0.341	0.266	0.781

Source: Annual Report of Bank & Company

From the different portfolios formed with ACE, UNL and NABIL shown in table 4.18, the highest portfolio return is derived from portfolio A and the least portfolio risk is derived from portfolio T with standard deviation 0.262. However, the total risk can be significantly reduced with a well-diversified portfolio. The different combination with different weight provides varying level of return and risk but there is no such big difference in return and risk. The portfolio H provides the least level of return of 29.9% with the highest CV where there is 80% investment in ACE stock, 10% in UNL and 10% in NABIL stock. It reveals that the investors are advised to invest in greater portion in NABIL stock to generate higher return. The high-risk taker investor will invest in portfolio A that provides the highest return of 52.3%. Among portfolios, portfolios T i.e. 30% in ACE stock, 60% in UNL and 10% in

Figure 4.15

ACE, UNL and NABIL

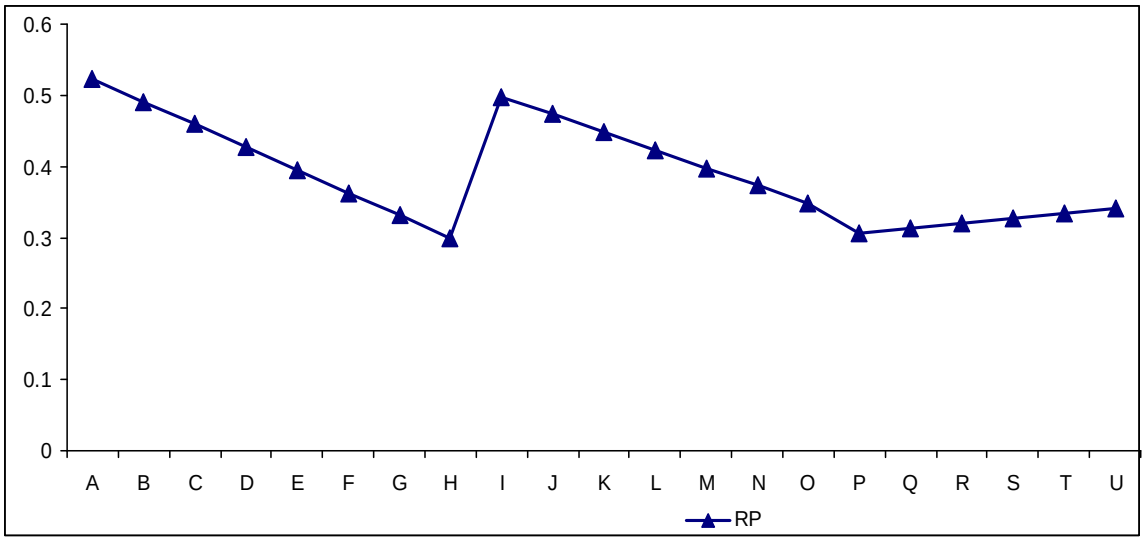


Table 4.18

Portfolios between UNL, BBCL and NABIL (Set 10)

	W_1	W_2	W_3	R_P	σ_p	CV
A	0.1	0.1	0.8	0.514	0.389	0.757
B	0.2	0.1	0.7	0.489	0.360	0.736
C	0.3	0.1	0.6	0.464	0.334	0.719
D	0.4	0.1	0.5	0.439	0.311	0.708
E	0.5	0.1	0.4	0.414	0.292	0.706
F	0.6	0.1	0.3	0.389	0.279	0.717
G	0.7	0.1	0.2	0.364	0.271	0.746
H	0.8	0.1	0.1	0.339	0.270	0.797
I	0.1	0.2	0.7	0.473	0.350	0.740
J	0.1	0.3	0.6	0.432	0.313	0.724
K	0.1	0.4	0.5	0.391	0.278	0.710
L	0.1	0.5	0.4	0.350	0.246	0.704
M	0.1	0.6	0.3	0.309	0.220	0.711
N	0.1	0.7	0.2	0.268	0.200	0.747
O	0.1	0.8	0.1	0.227	0.190	0.835
P	0.7	0.2	0.1	0.323	0.251	0.779
Q	0.6	0.3	0.1	0.307	0.234	0.764
R	0.5	0.4	0.1	0.291	0.219	0.754
S	0.4	0.5	0.1	0.275	0.207	0.753
T	0.3	0.6	0.1	0.259	0.198	0.763
U	0.2	0.7	0.1	0.243	0.192	0.789

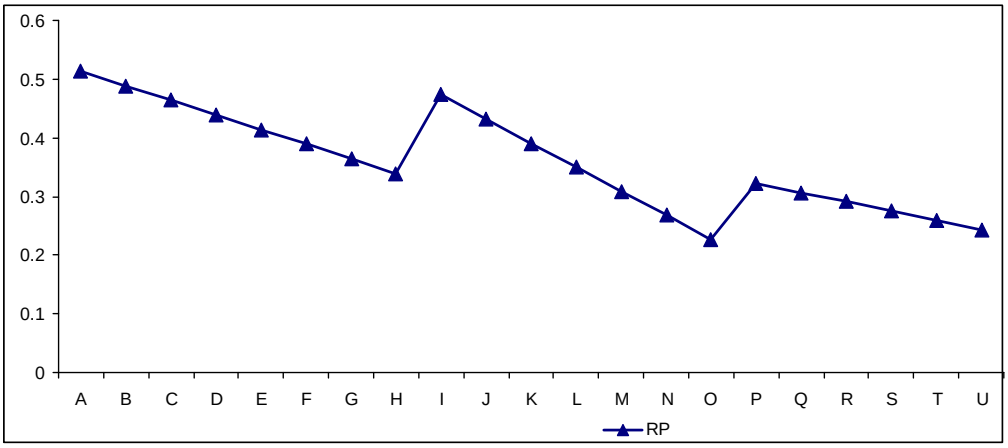
Source: Annual Report of Bank & Company

From the different portfolios formed with UNL, BBCL and NABIL shown in table 4.19, the highest portfolio return is derived from portfolio A and the least portfolio risk is derived from portfolio O with standard deviation 0.190 i.e. 19%. However, the total risk can be significantly reduced with a well-diversified portfolio. The different combination with different weight provides varying level of return and risk but there is no such big difference in return and risk. The portfolio O provides the least level of return of 22.7% and the highest CV where there is 10% investment in UNL stock, 80% in BBCL and 10% in NABIL stock which is also the minimum variance portfolio.

It reveals that the investors are advised to invest in greater portion in NABIL stock to generate higher return. The high-risk taker investor will invest in portfolio, A which provides the highest return of 51.4%.

Figure 4. 16

Portfolios between UNL, BBCL and NABIL



4.7 Ranking of Portfolios Sets

Different sets of portfolios have been ranked based on their return, risk and coefficient of variation, which have been shown in Table 4. 20.

Table 4.19

Ranking based on Portfolio Return, Risk and Coefficient of Variation (Set 11)

Portfolios	Combination with weights			R_P	σ_p	CV	Rank based on CV
Set 10-A	UNL	BBCL	NABIL				
	0.10	0.10	0.8	0.514	0.389	0.757	1
Set 9-A	ACE	UNL	NABIL				
	0.10	0.10	0.8	0.523	0.408	0.78	2
Set 7-A	ACE	BBCL	NABIL				
	0.10	0.10	0.8	0.507	0.4	0.788	3
Set 5-A		UNL	NABIL				
		0	1	0.58	0.461	0.795	4
Set 6-A		BBCL	NABIL				
		0	1	0.58	0.461	0.795	4
Set 3-A		ACE	NABIL				
		0	1	0.58	0.461	0.795	4
Set 8-O	ACE	UNL	BBCL				
	0.1	0.8	0.1	0.307	0.259	0.844	5
Set 1-A		ACE	UNL				
		0	1	0.33	0.296	0.897	6
Set 4-K		UNL	BBCL				
		1	0	0.33	0.296	0.897	6
Set 2-K		ACE	BBCL				
		1	0	0.26	0.347	1.3346	7

Source: Annual Report of Bank & Company

From the different subsets of portfolio consisting of different weights, the best subset of each set has been summarized in Table 4.16. From those different opportunity sets and ranking based on CV, the best portfolio is set 10-A consisting of the stocks of UNL.BBCL and NABIL with weights of 10%, 10% and 80% respectively in terms of lowest CV i.e. the lowest unit risk. Likewise, the portfolio between the stocks ACE, UNL and NABIL with weights of 10%, 10% and 80% respectively has been ranked second among all and that of ACE, BBCL and NABIL with same weights 10%, 10% and 80% is ranked in third position. Furthermore, the three portfolio sets comprising of the portfolio between UNL and NABIL with 0% and 100% weight, the portfolio between BBCL and NABIL with weight 0% and

100% and ACE and NABIL with 0% and 100% are ranked in fourth position. These portfolios provides the highest return of 58% and moderate level of CV with 0.795. Comparing to third ranked portfolio, these portfolios have nominal increment in CV but provides the highest level of return.

Similarly, the portfolio between ACE, UNL and BBCL with weights 10%, 80% and 10% provides the return 30.7% with 0.844 CV and ranked in 5^{th} position. 6^{th} rankers are the portfolios between ACE and UNL with weights 0% and 100% and UNL and BBCL with weights 100 and 0%. The portfolio between ACE and BBCL with weights 100% and 0% is ranked the 7^{th} position.

The table reveals that among the two assets portfolio, those portfolios provides the highest return, in which the investment of 100% alone in one stock and 0% in another stock.

If the investors are required to create a well-diversified portfolio between these stocks, they are recommended to create the portfolio between ACE, UNL and NABIL with weight 10%, 10% and 80%. But the investment strategy differs according to the risk bearing capacity. The risk bearer investor will invest in Portfolio Sets 5-A, 6-A and 3-A those provide the highest return with the unit risk of 0.795.

4.7.1 Optimum Portfolio

Based on simple Sharpe Portfolio Optimization Model, an optimum portfolio has been created. All securities whose excess return to risk ratio are above the cut off rate are selected and all whose ratios are below are rejected.

Table 4.20

Securities of an Optimum Portfolio and Their Weights

Stocks	$\wp$	$\frac{R_j - R_f}{\wp}$	Cut off rate (C*)	Unsystematic Risk	Z_i	Weight (X_i)
BBCL	0.21	0.626	0.0789	0.033	0.7311	0.1359
UNL	0.55	0.53	0.2330	0.055	1.6335	0.3037
NABIL	1.4	0.387	0.3855	0.001	3.0141	0.5604
R_P					**0.4484**	
σ_p					**0.3158**	
CV					**0.7043**	

Source: Annual Report of Bank & Company

From 4 sample securities, only 3 securities i.e. BBCL, UNL and NABIL have been selected for an optimum portfolio. The security of ACE has been eliminated, as its excess return to beta ratio is lower than cutoff rate. The optimum weights are 13.59%, 30.37% and 56.04% respectively. The optimum portfolio provides return of 44.84% 31.58% of standard deviation and CV with 0.7043. If an investor wants to create an optimum portfolio between these 4 samples, it is advised to select these three stocks with above weights. The optimum weights of the securities are depicted in figure below.

4.7.2 Portfolio Performance Evaluation

This model was derived by William Sharpe. Sharpe's measure divides average portfolio excess return over the sample period by the standard deviation of return over that period. It is the risk premium return earned per unit of total risk. So, this rate is appropriately called reward-to-variability ratio. A higher value of Sharpe's index means better performing portfolio as this indicates higher risk premium per unit of total risk.

Table 4.21

Sharpe index and Rankings for the different portfolios

Market	**R_P = 0.28**	**R_f = 0.0386**	**σ_p= 0.3285**	$Sp = \frac{R_p - R_f}{\pm \sigma_p}$	**0.740**
Portfolios	R_P	R_f	σ_p	$Sp = \frac{R_p - R_f}{\pm \sigma_p}$	Rankings
Optimal Portfolio	0.4484	0.0386	0.3158	1.287	1
Set 10-A	0.514	0.0386	0.389	1.222	2
Set 9-A	0.523	0.0386	0.408	1.187	3
Set 6- A	0.58	0.0386	0.461	1.174	4
Set 5 -A	0.58	0.0386	0.461	1.174	4
Set 3 -A	0.58	0.0386	0.461	1.174	4
Set 7 -A	0.507	0.0386	0.4	1.171	5
Set 8- O	0.307	0.0386	0.259	1.036	6
Set 1- A	0.33	0.0386	0.296	0.984	7
Set 4- K	0.33	0.0386	0.296	0.984	7
Set 2- K	0.26	0.0386	0.347	0.638	8

Based on the Sharpe portfolio index, the optimum portfolio is evaluated first. Similarly other portfolios ranked accordingly on the basis of Sharpe index. Set 6-A, Set 5-A and Set 3-A all are ranked in fourth position as they provide the same portfolio return, portfolio risk and same Sharpe index. Similarly, Set 1-A and Set 2- K both are ranked in seventh position. Among the best 11 portfolios, the least preferred is Set 2-K as it is ranked in last position.

4.8 Major Findings of the Study

The study findings are presented under sub headings such as the investment, risk and return analysis, optimal portfolios.

- NABIL stocks HPR has been observed maximum of 131.2% in 2008/09, whereas ACE HPR stood at 45%. BBCL and ACE experienced the negative return in the fiscal year 2004/05.

- Similarly, the market return recorded negative –22% in the year 2008/09 because of decrement of NEPSE index to 749.1 from 963.36. The market has highest rate return of 77% in the year 2006/07. The market has 32% returns with 31.62% of risk and 10% of CV.

- All the stocks under present study reveal the positive correlation with the market. The NABIL has the highest degree of correlation with the market with 0.99. BBCL with 0.47 the lowest among all. Similarly, ACE and UNL have correlation with market 0.70 and 0.62 respectively.

- The NABIL stock offers highest beta with 1.40 and referred as risky stocks. In the present study, all stocks except NABIL are found to be the defensive. While the value of the alpha representing the y-intercept provides the return of the stocks at zero percentage risk. Alpha of NABIL is the highest in compare to the alpha of other different stocks. It refers to NABIL's expected yearly return as 0.195 (19.5%) when the market earns nothing. The value is least in the case of ACE Development Bank with 0.065 (6.5%).

- Standard error of beta shown in the table 4.5 attempts to indicate the extent of estimation errors. The beta of different stock has confidence range between values presented in the table 6 representing the true values of the beta. However, the chances are roughly two out of three that the 'true' beta a standard error, plus or minus, of the estimated beta. Thus, ACE's beta is likely to be larger than 1.161 and smaller than 0.252, and not exactly 0.71.

- NABIL has the highest systematic risk i.e. 99.4% where as the stock of Bishal Bazaar Limited posses the minimum amount of systematic risk with 12.5%. Likewise, the proportions of systematic risk of ACE and UNL are 45.4% and 37.1% respectively.

- The highest coefficient of determination value of NABIL is 98%. Similarly the lowest coefficient of determination of BBCL is 0.22. Similarly, ACE and UNL posses the coefficient of determination value of 0.49 and 0.38 respectively.

- All of the returns in shares are positively correlated with each other. The correlation coefficient of ACE with UNL is highest with 0.2733. Similarly, the correlation coefficient of BBCL with ACE, ACE and NABIL, BBCL and UNL, UNL and NABIL

0.691. The correlation coefficient of BBCL with ACE is higher with 0.6940. The lowest correlation among all is between NABIL and BBCL with 0.2477.

- The security market line suggests the return other stock are at the minimum side share value are underpriced, in case of all the return of the company.

- The Portfolio construction suggest portfolios between ACE and UNL (Set-1) provides highest return of 33% at weight 0% and 100%. The risk is highest at weight 100% and 0% of 34.7% with C.V. of 0.897 and 1.3346 respectively. The portfolios return decreases whereas risk and CV increase accordingly to the changes in portfolios.

- The Portfolio construction suggest portfolios between ACE and BBCL (Set-2) provides highest return of 26% at weight 0% and 100%. The risk is highest at weight 100% and 0% of 34.7% with C.V. of 1.1412 and 1.3346 respectively. The portfolios return decreases whereas risk and CV increase accordingly to the changes in portfolios.

- The Portfolio construction suggests portfolios between ACE and NABIL (Set-3) provides highest return of 58% at weight 0% and 100%. The risk is highest at weight 100% and 0% of 46.1% with C.V. of .795 and 1.335 respectively. The portfolios return decreases whereas risk and CV increase accordingly to the changes in portfolios.

- The Portfolio construction suggests portfolios between UNL and BBCL (Set-4) provides highest return of 33% at weight 0% and 100%. The risk is highest at weight 100% and 0% of 29.6% with C.V. of .1.141 and .8977 respectively. The portfolios return decreases whereas risk and CV increase accordingly to the changes in portfolios.

- The Portfolio construction suggests portfolios between UNL and BBCL (Set-5) provides highest return of 58% at weight 0% and 100%. The risk is highest at weight 100% and 0% of 46.1% with C.V. of 0.795 and 0.897 respectively. The portfolios return decreases whereas risk and CV increase accordingly to the changes in portfolios.

- The Portfolio construction suggests portfolios between BBCL and NABIL (Set-6) provides highest return of 58% at weight 0% and 100%. The risk is highest at weight 100% and 0% of 46.1% with C.V. of 0.795 and 1.141 respectively. The portfolios return decreases whereas risk and CV increase accordingly to the changes in portfolios.

- The Portfolio construction suggests portfolios between ACE, BBCL and NABIL (Set-7) provides highest return of 50.7% at weight 10%, 10% and 80%. The risk is highest at weight 10%, 10% and 80%. Of 40% with C.V. of 0.788 and 0.936 respectively. The portfolios return decreases whereas risk and CV increase accordingly to the changes in portfolios.

- The Portfolio construction suggests portfolios between ACE, UNL and BBCL (Set-8) provides highest return of 30% at weight 20%, 70% and 10%. The risk is highest at weight 80%, 10% and 10%. Of 30.1% with C.V. of 0.826 and 1.168 respectively. The portfolios return decreases whereas risk and CV increase accordingly to the changes in portfolios.

- The Portfolio construction suggests portfolios between ACE, UNL and NABIL (Set-9) provides highest return of 52.3% at weight 10%, 10% and 80%. The risk is highest at weight 10%, 10% and 80%. Of 40.8% with C.V. of 0.780. The portfolios return decreases whereas risk and CV increase accordingly to the changes in portfolios.

- The Portfolio construction suggests portfolios between UNL, BBCL and NABIL (Set-10) provides highest return of 51.4% at weight 10%, 10% and 80%. The risk is highest at weight 10%, 10% and 80%. Of 38.9% with C.V. of 0.757. The portfolios return decreases whereas risk and CV increase accordingly to the changes in portfolios.

- Furthermore, the three portfolio sets comprising of the portfolio between UNL and NABIL with 0% and 100% weight, the portfolio between BBCL and NABIL with weight 0% and 100% and ACE and NABIL with 0% and 100% are ranked in fourth position. These portfolios provides the highest return of 58% and moderate level of CV with 0.795. Comparing to third ranked portfolio, these portfolios have nominal increment in CV but provides the highest level of return.

- The portfolio between ACE, UNL and BBCL with weights 10%, 80% and 10% provides the return 30.7% with 0.844 CV and ranked in 5^{th} position. 6^{th} rankers are the portfolios between ACE and UNL with weights 0% and 100% and UNL and BBCL

with weights 100 and 0%. The portfolio between ACE and BBCL with weights 100% and 0% is ranked the 7th position.

- Based on simple Sharpe Portfolio Optimization Model, an optimum portfolio has been created. All securities whose excess return to risk ratio are above the cut off rate are selected i.e. only the securities UNL, BBCL and NABIL have been selected for an optimum portfolio from available alternatives.

- The optimum weights based on cut off rate are 13.59% of BBCL 30.37% of UNL and 56.04% of NABIL respectively. The optimum portfolio provides the return of 44.84%. The optimum portfolio posses the risk (Standard deviation) of 31.58% and coefficient of variation i.e. risk per unit is 0.7043.

- The present study has evaluated the stocks of the sample stocks in terms of risk and return associated to the stocks. Using the tools developed by Sharpe, the portfolio ranking is based on Sharpe index. The optimum portfolio is ranked in first position with portfolio return of 45.60%, portfolio risk of 32.23% and Sharpe index with 1.2687.

- Similarly, Set 10-A ranked in second position, Set 9-A ranked as third position, Set 6-A, Set 5 –A and Set 3 –A are ranked in fourth position because of same portfolio return (58%), risk (46.1%) and Sharpe index (1.174). Similarly, Set 7 –A is ranked in fifth position. Set 8- O ranked in sixth position. Set 1- A and Set 4- K both ranked in seventh position. Finally, Set 2- K is ranked in the last position.

CHAPTER – V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

Investment in capital markets collect necessary funds and divert the collected funds towards the productive sectors. Capital market is a significant mechanism for the development of national economy. It boosts up the economic activities by mobilizing especially domestic financial resources. It provides best investment opportunities by transferring the funds from surplus savings to need based sectors through the transaction of financial instruments.

Financial instruments are traded in securities market. Stock market is the largest financial market all over the world where stocks of various business organizations are traded. It has the greatest role in the development of financial system.

After the formation of SEBO and conversion of SEC into NEPSE, brokers and market makers operate on the trading floor as per the Securities Exchange Act, Rules and Byelaws of NEPSE.

Portfolio management is concerned with efficient management of portfolio investment in financial assets, including shares and debentures of companies. A portfolio of an individual or corporate unit is the holding of securities and investment in financial assets. These holdings are the results of individual preferences and decisions regarding risk and return.

The objective of portfolio management is to analyze different individual assets and delineate efficient portfolios keeping in mind the safety or security of investment through diversification. Furthermore, the marketability and liquidity factors should also be considered in portfolio management.

The essence of portfolio theory can be simply stated. The two characteristics of interest are the *expected return* from the portfolio and the *risk.* Regarding the risk of the portfolio, the whole (the risk characteristics of the portfolio) is unequal to the sum of the parts (the risk characteristics of the individual assets).

Investment is not risk free. So an investor must think about the risk before making an investment in any securities. Nepalese individual investors do not seem to be investing their funds in stocks of different companies i.e. portfolio creation is not found in Nepalese context. In this regard, portfolio management is crucial for the minimization of risk associated to the return of their investment. Hence, this study is mainly focuses on the risk and return and portfolio management consisting of four samples securities in NEPSE.

Due to lower interest rate provided by the banks, Nepalese investors seem to invest their money in capital market in shares and debentures. Such tendency has been seen since the last decade significantly. After the establishment of NEPSE, private sectors initiated to raise funds through capital market. Capital market/ stock market, thus, have created investment opportunities to investors.

The general objective of this study is to create portfolio and management of portfolio consisting of different sector's companies in NEPSE.

5.2 Conclusions

The return of NABIL is the highest, which refers to that it provides maximum yeilds to the investor if the investor invests only in NABIL. But the variance and standard deviation are also considerably high in comparison to the returns of the other stocks. In comparison with market, NABIL is very profitable to invest but suitable only to the risk seekers. Coefficient of variation (CV) depicts the exact position of risk per unit of return. The higher the CV is, the higher risk and vice versa. CV is used to standardize the risk per unit of return i.e. measure the risk per rupee return. ACE stocks possess the highest value of CV and hence ACE stocks are the most risky stock among the samples. On the other hand, the investors retaining the stocks of NABIL assume least risk among four samples as they possess the least CV. The coefficient of determination shows the movements in the return being explained by market. The coefficient of determination also serves as a measure for systematic risk. The highest coefficient of determination value is NABIL. The risk can be diversified away with optimal portfolio construction. The market has provided the similar return by providing the optimum portfolio. The market beta and optimal portfolio beta are also calculated as per the requirement. The optimal beta is equivalent to 1. In the present study, the portfolio is evaluated on the basis of Sharpe index. A higher value of Sharpe's

index means better performing portfolio as indicated higher risk premium per unit of total risk. Although the portfolio returns are higher in other portfolios, optimum portfolio is ranked first because of the lowest level of risk. All these stocks have the lower required rate of return than the mean return. Hence, all the stocks are under priced in the market. As a result, the shares of all the sample companies appear attractive to investors.

5.3 Recommendations

Despite better performance and lucrative cash flows of the sample firm, an investor should make a rational decision prior to fund utilization. The present study though unfolded many options to make best utilization of fund but application of the same may not be feasible in the real practice. Following recommendations have, therefore, been provided on the basis of major findings of the study based on secondary and primary data analysis.

- In Nepalese context, the investors do not undertake any fundamental analysis when making investment decision. There is a trend of just purchasing on the basis of rumors. Hence, the investors are recommended to make stock transactions on the basis of proper analysis.

- Based on the all calculations from the study of four sample securities, the investors are recommended for greater exposure in NABIL's stock and the least in ACE stock.

- NABIL has to take initiative to control the price volatility in order to maintain the stable return and to minimize the risk. Similarly, BBCL has to adopt the mechanism to increase its rate of return to satisfy its shareholders.

- During the process of portfolio construction which portfolio set in efficient frontier is desirable for us is important. It is difficult to choose desire set; so, the investors should select that optimal portfolio set which provides highest return and lowest risk. Regarding the four sample securities in present study, the portfolio between the stocks of BBCL, UNL and NABIL with the weights 13.59%, 30.37% and 56.04% respectively has been observed to be the best and optimum portfolio from available alternatives. Hence, Nepalese investors who wish to create a well-diversified portfolio

are suggested to create a portfolio between those stocks by assigning the stated weights.

- The practice of creating a well-diversified portfolio cannot be found in Nepalese financial market. The investment risk can be significantly reduced with a well-diversified portfolio. Hence, it is suggested to diversify their investment in different securities that behave differently i.e. with low correlation for reducing poor portfolio performance.

- Nepalese investors prefer the stocks of Banking and Finance Sector only. They are recommended to invest in other sector as well in order to diversify the risk and to maximize the return.

- The brokerage firm takes a long time to transfer the name due to the lengthy procedure of stock market; it takes at least three months. The investor who wants to gain short-term capital gain from buying and selling the stocks are not allowed to do so because of delayed name transferring system adopted by the stock exchange. Therefore, the time must be reduced at least to 10 or 15 days.

- Except Bank and Financial Institutions other sector's companies don't publish quarterly (progress) report. So the investors are unaware of the financial position and cannot make long-term investment decision. So, those companies are recommended to disseminate the quarterly report in order to make investors aware about the position of the organization.

- In Nepal, There is not a single investment bank or investment firm exists, in such a situation, the investors who want to invest but is unaware of the behavior of stock market invests based on the rumors and bears a loss. So, the government, stock exchange and security board must take initiative to open such investment firms.

Appendix – I

Annual Market Return (R_M) $= \dfrac{NI_t+1 - NI_t}{NI_t}$

Where NI_t+1 = NEPSE Index at year t+1, and NI_t = NEPSE Index at year t

$= \dfrac{204.86 - 227.54}{227.54}$

$= -10\%$

Return on Market ($\overline{R_M}$) $= \dfrac{\phi\ R_M}{n} = \dfrac{1.40}{5} = 0.28 = 28\%$

Variance ($\exists_M^2$) $= \dfrac{(R_M-\overline{R_M})^2}{n-1} = \dfrac{0.4317}{5} = 0.108 = 10.8\%$

Standard Deviation ($\exists_m$) $= \sqrt{\dfrac{(R_M-\overline{R_M})^2}{n-1}} =$ Sqrt(0.108)

$= 0.3285 = 32.85\%$

The CML equation is developed as

$$Rj = Rf + \left[\frac{Rm - Rf}{\sigma_m}\right] \sigma j$$

$$Rj = 0.0386 + \left[\frac{0.28 - 0.0386}{0.3285}\right] \sigma j$$

$$= 0.0386 + 0.7349\sigma_j$$

$$\left[Rm - Rf\right]$$

$$Rj = Rf + \frac{}{\sigma_m} \sigma j$$

$$Rj = 0.0386 + \left[\frac{0.28 - 0.0386}{0.3285}\right] \sigma j$$

$$= 0.0386 + 0.7349\sigma_j$$

From group A to K the optimal portfolio that is positive and concave is selected as best portfolio.

Ranking based on Portfolio Return, Risk and Coefficient of Variation

Portfolios	Combination with weights			R_P	σ_p	CV	Rank based on CV
Set 10-A	UNL	BBCL	NABIL				
	0.10	0.10	0.8	0.514	0.389	0.757	1
Set 9-A	ACE	UNL	NABIL				
	0.10	0.10	0.8	0.523	0.408	0.78	2
Set 7-A	ACE	BBCL	NABIL				
	0.10	0.10	0.8	0.507	0.4	0.788	3
Set 5-A		UNL	NABIL				
		0	1	0.58	0.461	0.795	4
Set 6-A		BBCL	NABIL				
		0	1	0.58	0.461	0.795	4
Set 3-A		ACE	NABIL				
		0	1	0.58	0.461	0.795	4
Set 8-O	ACE	UNL	BBCL				
	0.1	0.8	0.1	0.307	0.259	0.844	5
Set 1-A		ACE	UNL				
		0	1	0.33	0.296	0.897	6
Set 4-K		UNL	BBCL				
		1	0	0.33	0.296	0.897	6
Set 2-K		ACE	BBCL				
		1	0	0.26	0.347	1.3346	7

Securities of an Optimum Portfolio and Their Weights

Stocks	$\wp$	$\frac{R_j - R_f}{\wp}$	Cut off rate (C*)	Unsystematic Risk	Z_i	Weight (X_i)
BBCL	0.21	0.626	0.0789	0.033	0.7311	0.1359
UNL	0.55	0.53	0.2330	0.055	1.6335	0.3037
NABIL	1.4	0.387	0.3855	0.001	3.0141	0.5604

Sharpe index and Rankings for the different portfolios

Market	**R_P = 0.28**	**R_f = 0.0386**	**σ_p= 0.3285**	**Sp = $\frac{R_P - R_f}{\sigma_p}$**	**0.740**
Portfolios	R_P	R_f	σ_p	Sp = $\frac{R_P - R_f}{\sigma_p}$	Rankings
Optimal Portfolio	0.4484	0.0386	0.3158	1.287	1
Set 10-A	0.514	0.0386	0.389	1.222	2
Set 9-A	0.523	0.0386	0.408	1.187	3
Set 6- A	0.58	0.0386	0.461	1.174	4
Set 5 -A	0.58	0.0386	0.461	1.174	4
Set 3 -A	0.58	0.0386	0.461	1.174	4
Set 7 -A	0.507	0.0386	0.4	1.171	5
Set 8- O	0.307	0.0386	0.259	1.036	6
Set 1- A	0.33	0.0386	0.296	0.984	7
Set 4- K	0.33	0.0386	0.296	0.984	7
Set 2- K	0.26	0.0386	0.347	0.638	8

BIBLIOGRAPHY

Books

Brigham, E. F. (1982). ***Financial management theory and practice***. New York: The Dryden Press.

Brigham, E. F., and Louis C. G. (1995). ***Intermediate financial management.*** New York: The Dryden Press.

Cheney, John M. and Moses Edward A. (1995), ***Fundamentals of Investments***, Chicago: St. Paul's West Publishing Company.

Fisher, D. E. and Jordon, R. J. (1992). ***Security analysis and portfolio management.*** New Delhi: Prentice Hall of India (p) Ltd.

Fisher. E. Donald and Ronal J. Jordan (2002): ***Security Analysis and Portfolio Management,*** Sixth Edition, New Delhi: Prentice Hall of India Pvt Ltd.

Francis J. C. (1992). ***Investment analysis and management***. London: McGraw-Hill Intonation Editions, Finance Series.

Francis, J.C. (1992), ***Investment analysis and Management***, New Delhi: McGraw Hill Publishing Company, Ltd.

Francis, Jack Clark (1986), ***Investment Analysis and Management***, New York: Harpes and Row publication Inc.

Gitman, L.J. (1988), ***Principles of Managerial Finance***, New York: Harpes and Row publication Inc.

Gupta O.P (1978), ***Behavior of Share Prices in India: a Test of Market Efficiency,*** New Delhi: National Publishing Company.

Gupta S.P (1997), ***Statistical Methods***, New Delhi: Sultan Chand and Sons Publicaions.

Gupta, L.C (1981), ***Rates and Return of Equities: The Indian Experience,*** New Delhi: Oxford University Press.

Hampton, John J. (1994), ***Financial Decision Making Concepts Problems and Cases***, New Delhi: Prentice Hall of India Private Limited.

Henning, Charles N., William Pigott and Rober Haney Scott, (1975), ***Financial Markets and the Economy***, Enlewood Cliffs: New Jersey.

Horne, James C. and Wachowicz, Jr. John M. (1996), ***Fundamentals of Financial Management***, New Delhi: Prentice-Hall of India Private Limited.

Kean, S.M. (1983), ***Stock Market Efficiency: Theory, Evidence & Implication***, Delhi: Heritage Publisher.

Kothari, C.R. (1994), ***Quantitative Techniques***, New Delhi: Vikas Publishing House Pvt. Ltd.

Kuchhal, S.C. (1974), ***Financial Management***, New Delhi: Chaitanaya Publishing House Pvt.Ltd.

Lawerence, D.Schall and Healey, Charis W. (1991), ***Introduction to Financial Management***, Singapore: Mc. Graw-Hill Book, Inc.

Levin, Richare and Rubin, David S. (1999), ***Statistics for Management***, New Delhi; Prentice Hall of India.

Mayo, B. (2002), ***Stock Returns and Implications***, London: Macmillion company.

Prasanna Chandra, (1994), ***Financial Management Theory & Practice***, New Delhi: Tata Mc Graw Hill Publishing Co. Ltd.

Reilly, Frank K. (1986), ***Investments,*** USA: The Dryden Press/CBS Publishing.

Sharpe William F., et.al. (2001), ***Investment*s**, Delhi: Prentice Hall of India.

Shrestha (2055), ***Portfolio Management in Commercial Banks***: Theory and Practice. Nepal Bank Patrikas published by Nepal Bank Limited.

Shrestha Manohar Krishna and Bhandari Dipak B. (2005), ***Financial Markets and Institutions,*** Kathmandu: Asmita Books Publishers and Distributors.

Thapa, Kiran (2002), ***Investment Theory & Practice***, Kathmandu: Prativa Prakashan.

Van Horne, J. C. (2000). ***Financial management and policy.*** New Delhi: Prentice Hall of India Pvt. Ltd.

Van Horne, James C. (2000), ***Financial Management and Policy***, New Delhi: Prentice-Hall of India Private Limited.

Weston, J.F. and Copeland, T.E. (1990), ***Managerial Fianance***, New York: Holt Saunders, International Editions.

Weston, J.F. and Copeland, T.E. (1992), ***Managerial Fianance***, New York: Holt Saunders, International Editions.

Wolf, H.K. & Pant P.R., (2003) ***A handbook for Research Methodology and Thesis Writing,*** Kathmandu: Buddha Academic Enterprises Pvt. Ltd

Articles, Journals & Reports

Agrawal Jagdish (July 2000), **Nepal's Capital Market: What it takes to improve,** Business Age, Vol.2, Kathmandu.

Agrawal, J. (2000, April). **Nepal's Capital Market: What it Take to Improve**. Kathmandu: **Business Age**. vol.2 No.5 pp 43-45.

Annual Report (2007/08). Securities Board of Nepal pp 5-85

Dahal, G.B. (2007 July). 'The performance of Nepalese IPOs'. ***SEBON* Journal**. pp 30-48

Fama Eugene F., (1970), **Efficient Capital Market: A Review of Theory and Empirical Works**, Journal of finance. Vol. 25, No. 5, New York.

K.C Bijay (2004), **Development of Stock Market and Economic Growth in Nepal**, SEBO Journal, Vol.1, Kathmandu.

Nepal Rastra Bank (2001), **Economic Review**, Kathmandu; Sihma Offset Press (P) Ltd.

Nepal Stock Exchange, **Annual Report** 1993/94 to 2007/2008.

Paul, M. (1960). 'The review of international capital markets'. **The American Economic Review**

Pradhan and Blampaki (2004), **Fundamentals of Stock Returns in Nepal**, SEBO Journal, Vol. 1, Kathmandu.

Pradhan, R.S (1993), **Stock Market behavior in Small Capital Market**: A case of Nepal, the Nepalese Management Review, Vol.9, No.1, C.D.M., T.U., Kathmandu.

SEBO, **Annual Report**, Fiscal Year 1993/94 to 2007/2008.

SEBO/N. **Annual Reports**. 2001-2009, Kathmandu.

SEBON, "**Annual Reports**", Various Volumes, Kathmandu.

Sharma, Bhaskar (June 2001), **Nepal's Only Secondary Market in Shambles**, Business Age, Vol.3, No.1, Kathmandu.

Shrestha Manohar Krishna (2002), **Capital Market in Nepal: Changing Dimension and strategies**, The Nepalese Management Review, CDM, Vol.8, No.1, Kathmandu

Shrestha, M.K. (1992). 'Shareholders' democracy and annual general meeting feedback, portfolios analysis'**. Nepal Publications**.

Simha, J.N. (1960). 'The capital market in India'**. Himalayan Publishing House**.

Tiwari, Gopal (1996), **Experts Propose Capital Market Overhaul**, The Kathmandu Post, Vol. 4, No. 9, Kathmandu.

Tiwari, Gopal (1998), **Nepalese Propose Market and Its Efficiency, The Rising Nepal**, Vol.3, No.21, Kathmandu.

Thesis

Aryal, M. (1995) **Behaviour of Stock Market. Kathmandu***:* An Unpublished Master degree thesis Submitted to FOM. T.U.

Bhandari, D. R. (2007), **A Study on Impact of Interest Rate Structure on Investment Portfolio of CBs of Nepal.** An Unpublished Master degree thesis Submitted to FOM. T.U.

Bhandari, Rajiv (2008), **Structure and Efficiency of Securities Market Intermediation Services in Nepal**, An Unpublished Masters Degree Thesis Submitted to Nepal Commerce Campus

Bhatta, D. (2005) **Portfolio Management of Listed Finance Companies in Nepal**. An unpublished Masters Thesis Degree Submitted to Central Department T.U.

Gautam (2005), **Portfolio Analysis of investment in Listed Companies.** An unpublished Masters Thesis Degree Submitted to Central Department, T.U.

Joshi (2002), **Investors' Problems in Choice of Optimum Portfolio of Stocks in Nepal Stock Exchange**. An unpublished Masters Thesis Degree Submitted to Central Department, T.U.

Khaniya, K. (2004), **Investment Portfolio Analysis of Joint Venture Banks**. An unpublished Masters Thesis Degree Submitted to Central Department, T.U.

Kisi, S.R. (2006), **Portfolio Analysis of Commercial Banks in Nepal**. An unpublished Masters Thesis Degree Submitted to Central Department, T.U.

Mahat, R. (2006), **Future Prospect of NEPSE in Capital Mobilization**, An Unpublished Masters Thesis Submitted to Shanker Dev Campus, T.U.

Sharma (2004), **Portfolio Management of Listed Commercial Banks and Insurance Companies in Nepal.** An Unpublished Masters Thesis Submitted to Shanker Dev Campus, T.U.

Shrestha (2004), **Portfolio Management in Nepal: A Case Study of Listed Commercial Banks in NEPSE.** An Unpublished Masters Thesis Submitted to Shanker Dev Campus, T.U.

Websites for Reference

Official website of NIDC Capital Markets, <http:/www.ncml.com.np>

Official website of NEPSE, <http:/www.nepalstock.com>

Official website of NMB, <http:/ www.nmb.com.np>

Official website of NRB, <http:/www.nrb.org.np>

Official website of SEBO, <http:/ www.sebonp.com>

<http:/ www.wikipedia.com>

<http;/ www.nepalsharemarket.com>

Search engine, <http:/www.google.com>