Chapter I

INTRODUCTION

1.1 General Background

Investment means employing money to generate more money in future. It is the sacrifice of current consumption of savings for future income available for consumption. Return is the primary motive of investment, but it always entails some degree of risk. Buying common stocks, bonds of a company, depositing money into bank account, buying a piece of land, gold or silver are examples of investment as all of them involve trade off between risk and return. All these examples involve sacrifice of current consumption in expectation of future return. Hence they are investments. As such, the main objective of investment is to maximize the wealth or capital gain of an investor resulting from rise in market value of securities. The general principle is that the investment can be retired when cash is needed. The decision to investment now is a most crucial decision as the future level of wealth is not certain. Time and risk are the two conflicting attributes involved in the investment decision. Broadly investment alternatives fall into two categories: real assets and financial assets. Real assets are tangible while financial assets involve contracts written on pieces of papers such as common stocks, bonds and debentures. Financial assets are bought and sold in organized security markets.

The proper mobilization and utilization of domestic resources is because of indispensable for any developing countries aspiring for a sustainable economic development in the changing nature of competitions and increasing pressure of globalization on today's business world. Good investment policy has a positive impact on economic development of the country. In recent years, international investors are attracted towards the

financial market of developing countries. As a result, many joint ventures banks and multinational companies are being established in the country. Bank and other financial institution are playing vital role in the economic development of the country. Successful implementation of investment policy is the prime requirement for the successful performance of banks and other financial institutions. Good investment policy has a positive impact on the economic development of the country.

Commercial banks and finance companies are some of the main components of business sector, which may have important role in the national economy. The business world is entirely different from one in the past. The changing life style has always been challenging to the business community and has given opportunities to produce thousand of types of goods and services to satisfy the changing needs of people. The societal needs have increased tremendously in quantity as well as in quality. Market for product and services have developed throughout the world and the competition among firms has induced business to get up investments in many fields. Where investment needs huge amount, which cannot be covered by the firm's past profit and surplus of individual investors only, the numbers of an economic society, individuals and institutions rarely have balanced budget. Some of them always earn more than what they consume and others earns less than what they consume. Further, some members of the society under taken additional activities of investing, requiring more funds than what they have. Thus, there is no equilibrium in income and expenditure. Similarly, these members have varying perceptions towards risk and enterprising ability. This disequilibrium in income and expenditure in the other hand and perception towards risk and enterprising ability of the other necessitated a mechanism to transfer financial resource from one unit to another unit of the society. The advent

of securities market has successfully served this purpose of fund transfer from one unit to the other.

In the market stock price can be affected by inflation, strengths of the dollar and price of the stock. The risk of a stock can be measured by its price volatility and its beta, banking sector is the most dynamic part of economy, which collects unused funds and mobilizes it in needed sectors. It is the heart of trade, commerce and industry. In Nepal, foreign joint venture commercial bank performs better than other Nepalese commercial banks because of their higher management efficiency and capacity of proper risk management. Nowadays, there are number of commercial banks growing in the country and numbers of joint ventures among them are also significant. Besides commercial bank, development banks are also investing their performance in Nepalese banking sectors.

This study of risk and return is basically focused on listed commercial banks of Nepal on the stock market and this study analyses the risk and return associated with investment among these banks on the basis of market price of stock and dividend.

1.2 Statement of the Problem

Although there has been an increasing interest among investors regarding the risk and return of common stocks, investors invest their funds on the basis of guess and hunches. They lack knowledge and appropriate information to deal with rationality. Investor has no other way beyond looking to the past trend of the stock price at investment decision. They are investing their fund in a single asset. This is why , they have to be made aware to assess risk and return associated with the stock or security

and encourage to manage portfolio among the assets with an aim to decrease risk earn more profit.

People think that the investment in stock is more risky. So it is necessary to use clear and simple technique to analyze risk associated with return.

There are different theories given related with risk and return analysis of stock. It is said that intrinsic value guides the stock price in the market. In an efficient market conditions, stock price is equal to the intrinsic value. In such kind of market, it is assumed that buyer and seller are fully aware of the facts and figures of the company. But, in our context, most of the buyers are ignorant about facts and figures of the financial institutions. They are motivated to invest in stocks by other factors. There are several questions arising in the mind of the individual investors at the time of investment. Therefore, it is needed to enhance faith in investors to invest in common stocks.

In the above context, some issues usually crop up. Some of them may be:

1. What is comparative risk position on sample commercial banks?
2. What is the trend of returns on commercial banks in Nepal?
3. How volatile is the stock price of sample commercial banks?
4. How can investor diversify the risk?

From the above discussions, it has been quite clear that risk and return analysis is important issues for the investors to invest in good securities to earn more returns with minimizing risk.

1.3 Objective of the Study

The main objective of this study is to analyze the risk associated with return on the common stock investment. The other specific objectives of this study are as follows:

1. To examine returns associated with common stock investment of commercial banks of Nepal.
2. To study systematic risks and unsystematic risks associated with security of commercial banks.
3. To analyze the volatility of common stock of commercial banks and other related variables.
4. To identify whether stocks of the sample commercial banks are equilibrium priced or not.

1.4 Significance of the Study

The main significance of the study is to demonstrate the risk and return associated with common stocks of commercial banks of Nepal. In addition, it would also help:

1. To study returns associated with common stock investment of commercial banks of Nepal.
2. To calculate systematic risks and unsystematic risks associated with security of commercial bank.
3. To analyze the volatility of common stock and other related variables.
4. To identify whether stocks of banks are equilibrium priced or not.
5. To help other researcher and investors in the area of investment as it provides suggestion to some extent.

1.5 Limitation of the Study

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

1. Risk and return of only common stock will be analyzed.

2. Only five years observations are analyzed.

3. Analysis is mostly based on the tools developed in contest of efficient market condition that may reduce validity of finding.

4. The study is focused only on the analysis of relationship of MPS with financial indicators and the level of risk associated with the common stock investment of the sampled companies.

5. The major portions of analysis and interpretation have been done on the basis of the available secondary data and information. So, the consistency of findings and conclusions are dependent upon the reliability of secondary data and information.

6. Time and financial constraints are also major limitation of the study.

1.6 Organization of the Study

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

Chapter I: Introduction

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

Chapter II: Review of Literature

This chapter contains the profound review of available literature related to the area of this study. It is directed towards the review of conceptual framework and review of major relates studies. Risk and return, its

relationship, determinants, measuring techniques and methods etc are reviewed from the various available literatures.

Chapter III: Research Methodology

This unit presents research methodology used in the study which includes various tools and techniques of data. It consists of research method as library research and field research, sources of data, population and sample, research design, methods of data analysis etc.

Chapter IV: Data Presentation and 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.

Chapter V: Summary,Conclusion and Recommendation

This chapter is for summary, conclusion and recommendation for further improvement. This chapter contains the profound review of available literature related to the area of this study. It is directed towards the review of conceptual framework and review of major related studies. Risk and return, its relationship, determinates, measuring techniques and method etc are reviewed form the various available literatures.

Chapter II
REVIEW OF LITERATURE

In this chapter, an attempt has been made to review some of the basic literature on risk and return analysis of common stock. In this regard, basic academic books in finance and other related studies are reviewed. Review of literature deals with theoretical aspects of risk and return analysis of common stock, enabling the researcher to take adequate feedback to broaden the information.

2.1 Conceptual Framework

In this section, efforts have been made to understand various aspects relating to stock's risk and return. Here main concentration is its implication in the investment of common stock.

2.1.1 Common Stock

It may be defined as a share in the ownership of the firm. Common stockholder are real owner of business firm common stock are more risky than both preferred stock and bond but it has also benefit like voting right, right in participation in profit. And common stock may be purchase and sold immediately.

"Common stock is a security which does not have any fixed maturity and fixed return. However the investor in common stock are able to exercise control over corporation through their voting rights. It is a most risky security because of the company goes bankrupt, common stockholders are the last in priority of claim on assets and earnings of the firm and the possibility is high that they lose every thing of their investment. The rights and responsibilities of common stockholders are so important that they are specified by country or state laws. The preemptive right is contained in

almost all the charters of the company. The common stockholders have the right to vote in shareholders meeting but bondholders and preferred stockholders do not enjoy such rights. But the method of voting that has come into prominence in recent years is cumulative voting" (Pradhan, 2008)

"Common stock is an ownership security. Common stockholders will get the return from common stock. People typically buy common stock expecting to earn dividends plus a capital gain when they sell their shares at the end of some holding period. The capital gain may or may not be realized, but most people expect a gain or else they would not buy stocks. Total return consists of two elements namely. Dividend yield and capital gains/losses yield". (Thapa, 2006)

"Common stock represents ownership status in a firm. It has a residual claim. In the sense that shareholder can receive earnings only after the payment of all others claims of securities. But it has also an unlimited potential for divided payment through increasing earning and for capital gains through raising prices. The risk is highest with common stock investment. Common stock holders usually have voting rights in the management of the corporation bond holders and usually holders of preferred stock have no voting rights. Since the value of common stock depends largely on its earning, it is often issued with on par value. In the case of bankruptcy common stock holders are in the principle entitled only to assets remaining after all period claimants have been satisfied when investors buy common stock, they receive certificate of ownership as a proof of there being part of the company. The certificate states the number of shares purchased and their par value."(Bhalla, 2000) "Common stock holders are the owner of the corporation. As owners,

common stock holder have certain rights, the most important are the right to participate in profit distribution, the right to vote etc. From the corporation viewpoint, common stock represents a fund raising device. From the investor's viewpoint, stock ownership gives the stockholders an opportunity to share in the profit when declared as dividend, opportunities to make money on appreciation in value of the securities and the opportunity to vote for directors of the corporation."(Francis and Taylor, 1992)

2.1.2 Return on Common Stocks

The term return may be defined as the changing value plus any cash receipt which is expressed as a percentage of the beginning period investment value. An investor can be obtaining two types of return from any investment in a share of stock or bonds. They are

1.   Income from price appreciation (or losses from price depreciation or capital gain/losses)

2.   Cash income from cash dividend.

"The return from holding in investment over some period, say a years, is simply any cash payments received due to ownership, plus the change in market price dividend by the beginning price. Thus, the return comes from two sources: income and price appreciation" (Bradley and Mayers, 2002)

From common stock, we may define single period return as

$$R = D_t + (P_t + P_{t-1}) / P_{t-1} \qquad \text{................ (i)}$$

Where,

R = Actual/ Expected return

T = Particular time period in the past (future)

P_t = Stock's price at time t

P_{t+1} = Stock price at time t – 1

D_t = Dividend at time t

"The single period rate of return is the basic random variable in investments analysis. This rate of return concept is important because it measures the speed of which the investor's wealth increases or decreased. An investment's single period rate of return denoted by r is simply the total return on investor would receive during the investment period or holding period stated as percent of the investment's price at the start of holding period" (Francis,2000). "Investment decision is based on expectations about the future. The expected rate of return for any assets is the weighted average rate of return, using the probability of each rate of return as the weight. The expected rate of calculated by summing the product of rates of return and their respective probabilities" (Francis, 2000b)

$$(r) = \sum_{t=1}^{t} P_t r_i \qquad \text{................} (ii)$$

Where,

(r) = Expected rate of return

P_t = Probability of stock t

r_i = Rate of return of 'I' stock

r = Event are perceived as possibilities

= Sign of summaries

Similarly, expected rate of return is also obtained by arithmetic mean of past year return. Symbolically

$$(r_j) = \sum (R_j)/n$$

Where,

(r_j) = Expected rate of return of stock j

n = Number of year that return is taken

= Sign of summation

The return, in general is any cash payments received due to ownership plus the change in market price dividend by the beginning price of investment.

"Return is defined as the dividend yield plus capital gain or loss. The relationship between different levels of return on there relative frequency is called a probability distribution. We could be formulating a probability distribution for the relative frequency of a firm announces return by analyzing its historical return over the previous year. But we know that history never repeats itself exactly. Hence, after analyzing relativity frequencies of historical return for the individual company, we can from a probability distribution based on historical data plus the analysis for the outlook for the economy and the outlook for the firm in its industry and another factors" (Van Horne and Wachowicz, 1995)

"The return is the total gain or loss experienced on an investment over a given period of time. It is commonly measured as the chance in value plus any cash distributions during the period, expressed as a percentage of the beginning of person investment value"(Gitman,2001)

- **Required Rate of Return**

It is minimum return that investor expects at least not to suffer from loose. If an investor gets return below the required rate of return, he/she suffers from loss and if investor gets more that the rate he she obtained profit.

"When setting a required rate of return an investor must consider the real rate of return expected inflation and risk. Because consumptions for this deferred consumption since the investor expected to receive an increase in the call goods purchased later and assuming for the moment zero expected inflation and risk the required rate could equal the real rate of return, in which case it would represent the pure time value of money" (Cheney and Eduard, 1997)

2.1.3 The Risk in Common Stock

Risk is defined as the variability of the return of a period. The one – period rate of return is the basic random variable used in measuring an investment risk. The greater the variability of the returns, lower the riskier the project. Risk is a product of uncertainty and its magnitude depends upon the degree of variability in uncertain cash flows. Risk in fact is an indication of chance of loosing investment value. Different people interpret risk in different ways: To some it is simply a lack of definite outcome. This can be any unknown event, which may be unfavorable. It is a chance of happening some unfavorable event or danger of losing so me material value.

"Risk, defined most generally, is the probability of the occurrence of unfavorable outcomes. But risk has different meaning in different context. In our context two measures developed from the probability distribution have been used as initial measures developed from the probability distribution have been used as initial measures of return and possibilities that we face. Therefore, risk. These are the mean and the standard deviation of the probability distribution" (Weston, 1996)

"Risk and return are the determinant for the valuation of securities. However, risks means that we do not know what is going too happened

even through we occasionally have a good idea of the range of risk may be defined as the like – hood that the actual return from an investment will be less than the forecast return. Standard differently, it is the variability of return from an investment" (Cheney, 1996)

Sources of Investment Uncertainty

Every investment has uncertainties. Uncertainties make future investment returns risky. The sources of uncertainty that contribute to investment risk are as follows:

-Interest Rate Risk: It is the potential variability of return caused by changes in the market interest rates. If market interest rates rise, then, investments' values and market prices will fall, and vice versa.

-Purchase power Risk: It is the variability of return an investor suffers because of inflation. Inflation (or a rise in general prices over time) seems to be the normal way of life in most countries today. However, when inflation takes place, financial assets (such as cash, stocks, and bonds) may lose their ability to command the same amount of real goods and services they did in the past. To put another way, the real rate of return on financial assets may not adequately compensate the holder of financial assets for inflation.

-Bull – Bear Market Risk: This risk arises from the variability in market returns resulting from alternating bull and bear market forces.

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

-Default Risk: It is the portion of an investment's total risk that results from changes in the financial integrity of the investment.

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

-Callability Risk: Some bonds and preferred stocks are issued with a provision that allows the issuer to call them in for repurchase.

The portion of a security's total variability of return that derives from the possibility that the issue may be called is the Callability risk.

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

-Political Risk: The portion of an asset's total variability of return caused by changes in the political environment (for example, a new tax law) that affect the asset's market value.

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

-Management Risk: Management risk is defined as the variability of return caused by a decision made by a firm's management and board of director's. Though many top executives earn princely salaries, occupy

luxurious offices, and wield enormous power within their organizations, they are mortal and capable of making a mistake or a poor decision. Furthermore, errors made by business manager can harm those invested in their firms. Forecasting management errors is difficult work that may not be worth the effort and as a result imparts a needlessly skeptical outlook. Agency theory provides investors with an opportunity to replace skepticism with informed insight as they endeavor to analyze subjective management risk.

Fundamental of Risk Management

Risk management by defining some commonly used terms that describe different risks; some of these risks can be changed.

-Pure Risk: It is such type of risk that offers only the prospects of a loss example includes the risk that a plant will destroy by fire.

-Speculative Risk: Speculative risks are situation that offers the chance of gain but might result in a loss. Thus, investments in new projects and marketable securities evolved speculative risks.

-Demand Risk: Demand risks are associated with the demand for a firm's products or services. Because sales are essential to all business demand risk is one of the most significant risks that firm faces.

-Financial Risk: Financial risks are seeks that result from financial transaction. If firms plan to issue new bonds, if it faces the risk that interest rates will raise before the bonds can be bought to market.

-Property Risk: Property risks are associated with destruction of productive assets. Thus the threat of fire, floods is riots impose property risk on a firm.

-Personal Risk: Personnel risks are that risk that result from employee's action.

-Environmental Risk: Environmental risk includes risk associated with polluting the environment. Public awareness in recent years, coupled with huge costs of environmental cleanup, has increased the importance of this risk.

An Approach to Risk Management

Firms often use the following process for managing risks

-Identify the risks faced by the firm: The risk manager identifies the potential risks faced by his or her firm.

-Measurement the potential impact of each risk: Since risks are so small as to be immaterial, whereas others have the potential for dooming the company. It is useful to segregate risks by potential impact and then to focus on the most serious threats.

-Decide how each relevant risk should be handled: In most situation risk exposure can be reduced through one of the following technique:

1.   Transfer the risk to insurance company: It is after advantageous to insure against risk, however, insurability does not necessarily mean. That a risk should be covered by insurance in many instance, it might be better for the company to self insure, which mean bearing the risk directly rather than paying another party to bear it.

2.   Transfer the function that produces the risk to a third Party: For example, suppose a furniture manufacture is concerned about potential liabilities arising form its ownership of a fleet of tracks used to transfer products form its manufacturing plant to various points' actors the

country. One way to eliminate this would be to contract with a trucking company to do the shipping.

3.   Purchase derivative contracts to reduce risk: Firms use derivatives to hedge risks. Commodity derivatives can be used to reduce input risks. Similar, financial derivatives can be used to reduce risks that arise from changes in interest rates exchange rates.

4.   Reduce the magnitude of the loll associated with an adverse event Occur in some instance it is possible to reduce the probability that an adverse event will occur.

5.   Reduce magnitude of the loss associated with an adverse event.

6.   Totally avoid the activity that gives rise to the risk: For example, a company might discontinue a product a service live because the risks out weight the rewards.

Measurement of Risk

There are different elements of risk measurement, some are as follows:

-Standard Deviation: The standard deviation ( ) of individual stock measures the investment risk. The smaller the standard deviation, the lower will be the degree of risk of the stock.

"Useful measures of risk should some how take into account both the probabilities of various possible bad outcomes and their associated magnitudes. Instead of meaning the probability of a number of different possible outcomes, the measure of risk should some how estimate the extent to which the actual outcome is likely to diverge from the expected outcomes. Standard deviation is measure that does this, because it is an

estimate of the likely divergence of an actual return form an expected return" (Sharpe et al. 2003)

Following formula can be used to calculate variance and standard deviation of historical rate of return of a share.

$$= \quad 1/n \quad [R - E(R)]^2$$

Where, = Standard deviation

R = Holding period rate of return

E(R) = Expected or average return

Higher the standard deviation of past return, greater will be the risk due to the volatile composition of past return and future return would be more unpredictable and uncertain. On the other hand, smaller the standard deviation, lesser will be the risk due to the return pattern being less volatile and more predictable as well.

Following formula can be used to calculate the standard deviation on the basis of probability:

$$= \quad P[R - E(R)]^2$$

= Standard deviation

P = Probability of event

R = Return of given period

E(R) = Expected rate of return

-Coefficient of Variation (C.V): The coefficient variation (CV) is the other useful measure of risk. It is the standard deviation divided by the expected return, which measures risk per unit of return. It provides a

more meaningful basis for comparison when the expected returns on two alternatives are not the same. If investors believe that the rate of return should increase as the risk increase, then the coefficient of variation provides a quick summary of the relative trade-off between expected return and risk.

$$CV_J = \sigma_J / X_J$$

Where, CV_J = Coefficient of variation of stock J

σ_J = Standard deviation of stock J

X_J = Expected return of stock J

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

"Portfolio theory is normative approach to the investor's decision to invest assets or securities under risk. It is based on the assumption that holds well – diversified portfolios instead of investing their entire wealth in a single assets or security. If the investors hold a well – diversified portfolio, then his concern should be the expected return and risk of the portfolio rather than individual assets or securities. The second

assumption of the portfolio theory is that the returns of securities are normally distributed. The mean (the expected value) and variance (or standard portfolio) analysis is the foundation of the portfolio decision". (Pandey, 1999)

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

Symbolically,

$$E(R_p) = W_i \, E(R_i) \quad + W_j \, E(R_j)$$

Where, $E(R_p)$ = Portfolio return

$\quad\quad W_i$ = Proportion of wealth invested in i assets

$\quad\quad W_j$ = Proportion of wealth invested in j assets

$\quad\quad E(R_i)$ = Expected return on i assets

$\quad\quad E(R_j)$ = Expected return on j assets

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

Symbolically,

$$_p = \quad W_i^2 \; _i^2 + W_j^2 \; _j^2 + \; 2W_iW_j \, cov(R_i,R_j)$$

Where,

$_p$ = Portfolio standard deviation

W_i = The proportion of portfolio devoted by security i

$_i$ = The standard deviation of security i

W_j = The proportion of portfolio devoted by security j

$_j$ = The standard deviation of security j

$cov(R_i, R_j)$ = covariance between return of security I and j

2.1.5 Covariance and Correlation

Covariance

Covariance is a measure of the degree in which two variables "move together" over time. A co-variance between the rate of return for the assets that is positive indicates that the rate of return tend to move in the same direction at the same time. 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. The covariance between assets return can be calculated by using the following equation:

a.   If the probabilities is given:

$Cov_{ij} = \quad p[R_i - E(R_i)] [R_j - E(R_j)]$

b.   If the probability is not given (or if historical or past information is given)

$Cov_{ij} = 1/n \quad [R_i - (R_i)] [R_j - (R_j)]$

Where,

Cov_{ij} = Covariance between return on assets i and j

   n = no. of observations

p = probability

E(R) = Expected rate of return

R   = Mean return

-Correlation

Correlation is also a measure of the relationship between two assets. Its values are limited between the range of +1 and -1. Correlation and covariance are related by the following equation:

$$\rho_{ij} = Cov_{ij} \big/ \sigma_i \sigma_j$$

Where, σ_i and σ_j are the standard deviations of returns for assets i and j , and ρ_{ij} is the correlation coefficient for assets i and j.

2.1.6 Diversifiable and Undiversifiable Risk:

-Total Risk: Total risk or total variation of the rate of return for an individual security or portfolio is measured by the standard deviation or variance of the rate of return. According to CAPM, total risk of an asset can be divided into two parts. They are diversifiable risk and Undiversifiable risk.

Total risk = Undiversifiable risk + Diversifiable risk

-Diversifiable Risk: Diversifiable risk is the portion of the total risk that can be diversified away. It is also called unsystematic risk or avoidable risk or company-specific risk or non market risk. This type of risk divers from one company to another. It is caused by events particulars to the firm. For example, labour strikes, management errors, inventions, advertising campaigns, shifts in consumer taste and law suits etc. this type of risk can be eliminated through efficient diversified portfolio.

-Undiversifiable Risk: Undiversifiable risk is the portion of the total risk of an individual security caused by market factors that simultaneously affect the prices of all securities. It can't be diversified away. It is also called market risk or unavoidable risk or systematic risk or beta risk. It stems from factors, which systematically affect all firms, such as war, inflation, recession, high interest rates, depressions, and long term changes in consumption in the economy.

Mathematically, the systematic risk (beta) is measured as the covariance of the stock returns with the market returns expressed per unit of market variance as follows:

-Beta Coefficient (β_i):

$$\beta_i = \underline{Cov(R_m, R_i)} \; / \; \sigma_m^2 \; = \; \rho_{im} \; x \; \sigma_i \; \sigma_m$$

Where,

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

σ_m^2 = Variance of market return

ρ_{im} = Correlation between the return of security i and market.

-Market Risk: Since market portfolio contains all risky assets, it is a completely diversified portfolio. Because of this completely diversification, all of the unsystematic risk of individual assets is diversified away in the market portfolio. So market risk always consists of systematic risk which is measured by beta coefficient. The beta coefficient is an index of systematic risk. Betas can be used for an ordinal ranking of the systematic risk of assets. The beta of market return is equal to 1. It is also knows as average risk of the market. If the beta of an asset is greater than one it is known as aggressive assets because its return is more

volatile than the market portfolio. In the same manner, if the beta of an asset less than one, the asset is called defensive assets and its price volatile is less than the market.

Market portfolio risk $= \mathrm{Cov}\ (R_m, R_m) / \sigma_m^2 = \sigma_{mm} \times \sigma_m \times \sigma_m / \sigma_m^2 = 1 \times$

$\sigma_m \times \sigma_m / \sigma_m \times \sigma_m = 1$

-Portfolio Beta (β_p): Portfolio is the combination of securities. Portfolio beta is the weighted average beta of total assets that are involved in a portfolio.

Portfolio beta (β_p) $= \sum W_i \beta_i = W_1 \beta_1 + W_2 \beta_2 + \ldots\ldots + W_n \beta_n$

Where,

W_i = Weight of asset included in the portfolio

β_i = Beta of asset included in the portfolio.

-Capital Asset Pricing Model

CAPM is a model that describes the relationship between risk and expected return. It explains the behavior of security price. It also describes how the price and interest rate on risky financial assets are determined in the capital market. In this model, a security's expected return is the risk free rate plus a premium based on the systematic risk of the security, where risk is measured by the beta coefficient.

Let Us Review the Basic Principles of Portfolio Selection:

Investors like high expected return and low standard deviation. Common stock portfolios that offer the highest expected return for a given standard deviation are taken as efficient portfolios.

1.   If the investor can lend or borrow at the risk free rate of interest, one efficient portfolio is better than all the others. The portfolio that offers the highest ratio of risk premium to standard deviation. A risk – adverse investor will put part of his money in this efficient portfolio and part in the risk free asset. A risk tolerant investor may out all her money in this portfolio or she may borrow and put in even more.

2.   The composition of this best efficient portfolio depends on the investor's assessments of expected returns. Standard deviation and correlations. But suppose everybody has the same information and the same assessments. If there is no superior information, each investor should hold the same portfolio as everybody else, in other words every one should hold the market portfolio.

"CAPM provides a measure of risk and method of estimating the market's risk return line. The market or systematic risk of security is measured in terms of its sensitivity to the market movement. This sensitivity is referred to the security's beta. Investors can eliminate unsystematic risk when they invest their wealth in a well diversified market portfolio" (Pandey, 1999)

"Based on the behavior of risk adverse investors there is an implied equilibrium relationship between risk and expected return for each security. In market equilibrium a security is supposed it provide an expected return commensurate with its systematic risk of a security. Greater the systematic risk grater the return and systematic risk and the valuation of securities that follow, is the essence of Noble laureate William shaper's capital assets pricing model (CAPM)."(Van Horne, 2000)

The security market line clearly shows that return is the increasing function. The SML equation as suggested for the computation of expected rate of return on common stock. The model is
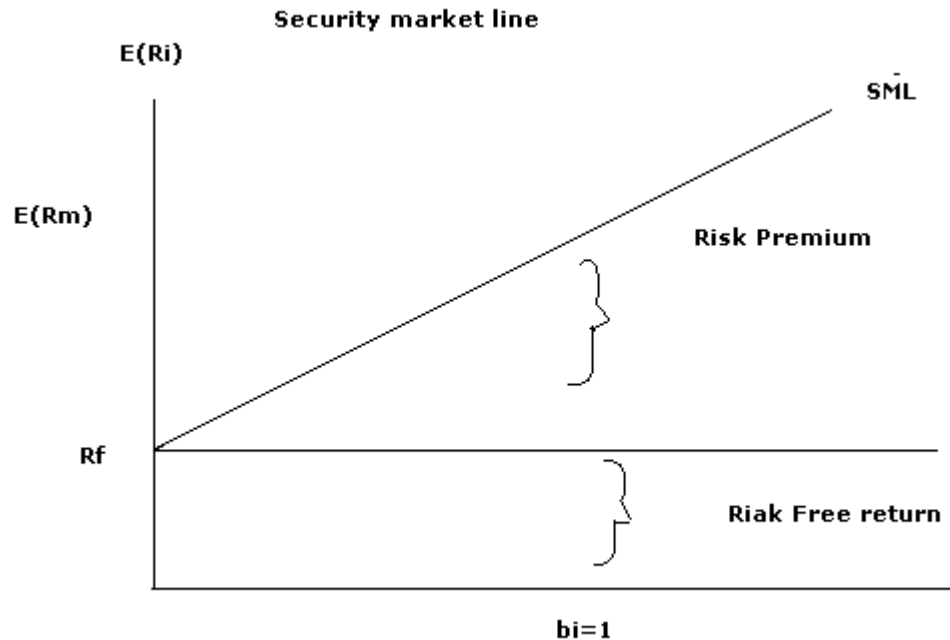
$$E(R_j) = R_f + [E(R_m) - R_f] \ _j$$

Where,

$E(R_j)$ = Expected return on security j

R_f = Risk free rate

$E(R_m)$ = The expected market return

$_j$ = Assets beta

Diagram 2.1

Security market line

"In market equilibrium the required rate of return on stock equals its expected return. That is all stocks will be on the security market line, where happens when this is not so? The primary concern of portfolio

27

management is to identify the overpriced and under priced of security. Overpriced and under priced of security. Overpriced and under priced securities are identified either comparison of their value with market price or compassion of required rate of return and expected return.

Diagram 2.2

Under price and Overpriced stock during temporary market disequilibrium
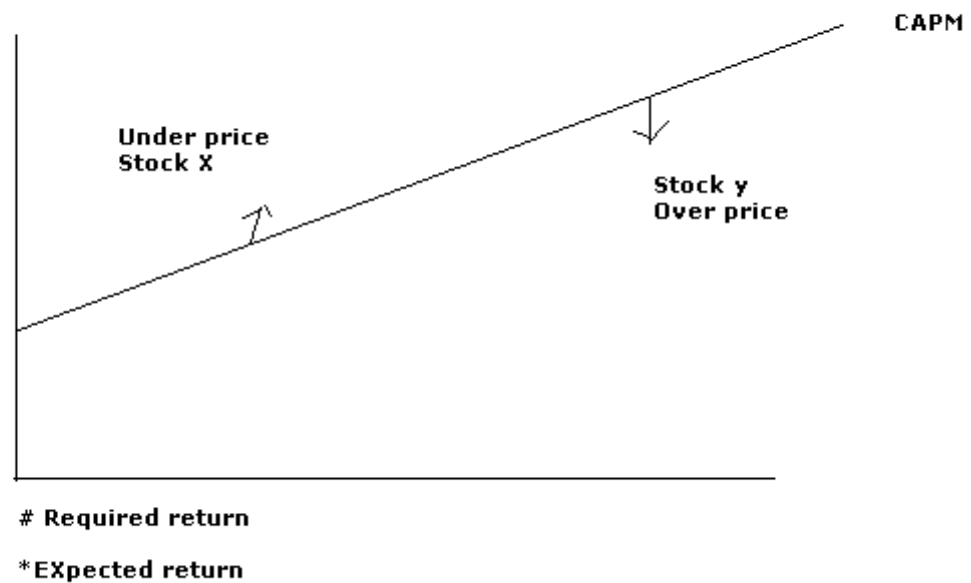
As a result stock X is expected to provide a rate of return grater than the required, base on its systematic risk. Stock Y is expected to provide a lower return than required to compensate for its systematic risk. Investors seeing the opportunity for superior returns by investors holding this stock would sell it, recognizing than they could obtain a higher return for the same amount of systematic risk with other stocks." (Brigham and Louis, 1999)

"The CAPM is based on the efficient market hypothesis and provides a basis to measure the systematic risk in terms of covariance of its return with the market return, correct benchmark, and thus measure relative performance. Standard deviation of returns measure of total risk may not

fully capture the complex risk taking from hedge funds dynamic, highly levered strategies. Monthly incentive fees therefore contain an unknown reporting bias that may be as important as depreciation rates, common cost allocation, and transfer pricing issues in accounting profits." (Sharan,2009)

2.2 Review from Nepalese Studies

In the topic of finance, very few independent studies can be found. However, the available independent studies which are related to the Nepalese stock market and about shareholder's democracy, views expressed by different person in their articles regarding risk and return of common stock of commercial banks are presented or reviewed here in the topic.

A study conducted by Prof. Dr. Radhe Shyam Pradhan and Mr. Surya B. Balampaki in the topic of Fundamentals of Stock Returns in Nepal, in 2004 is taken into consideration. This study is helpful to analyze the stock's return from different aspects.

"This study is based on pooled cross sectional data of 40 listed companies in NEPSE Ltd and traded in the stock market. The study examinees of dividend yield, capital gain yield and total yield are related to earning yield, book market ratio and cash flow yield. Pradhan and Balampaki has summarized the following results.

1.   Earning yield and cash flow yield have significant positive impact on dividend yield, and an insignificant impact on book to market value, whereas, size has negative impact on dividend yield. In the case of earnings yield and cash flow yield, cash flow yield has been found to be more informative than earnings yield.

2.   Capital gain yield is positively influenced by earnings yield and size, whereas, the same is negatively influenced by book to market value and cash flow yield. Book to market value has been found to be statistically strong in predicting capital gain yield.

3.   Similarly, total yield is positively determined by earning yield and size, where as, the same is negatively determined by book to market value has been found to be more informative than other variables.

4.   The positive relationship exists among earnings yield, book to market value and cash flow yield. However, the size is negatively related to these three variables".(Pradhan and balampaki,2003)

Similarly, another study was carried out by Prof. Dr. Manohar Krishna Shrestha in 1992 in the title of shareholders Democracy and Annual General Meeting Feed Back. There, Mr. Shrestha has critically analyzed the situation of common stock investors and the situation that is not improving till date.

Mr. Shrestha's study has been divided into two parts. The first part includes view on the rights of the shareholders regarding how they can exercise then in democratic perspective and second part consists of feedback and the issues raised by shareholders at different annual general meeting of public Limited Companies and financial institutions.

"In this study, he mentions that government is not interested in formulating separate act to protect the right of shareholders, although the size of shareholders population in Nepal has been growing constantly and he has viewed the need of separate act regarding the protection of shareholders right. Company and others acts relating to financial and industrial sector has provisioned rights of the shareholders as:

1.   Voting right

2.   Participation in general meeting

3.   Right of getting information

4.   Electing as a board of director

5.   Participation in the profit and loss of the company

6.   Transferring shares

7.   Proxy representation

The Collective rights of the shareholders are:

1.   Amend the internal by laws

2.   Authorize the sale of assets

3.   Inter into merger

4.   Change amount of authorize capital

In many cases of the existing authoritarian mentality of management seems to have not considered the shareholders in deciding the managerial plans and policies. Top level decision often by passes the interest of shareholder's rights and expectations. The annual general meeting has become a platform for shareholders to express opinions and grievance in front of the management and board of directors. Many general meetings feedback reveal no serious response to the felling of shareholders. It reflects unwillingness of the management and board of directors to change their traditionally held activities towards shareholders. (Shrestha, 1992)

Similarly mini research paper conducted by Khagendra Prasad Ojha(2000) in the title of "Financial performance and common stock pricing" where Mr. Ojha was concluded that "An investment in common stock of a corporate form neither ensures annual return not ensure the return of principle. Therefore, investment in common stock is very sensitive on the ground of the risk. Dividend to common stockholders is paid only of the firm marker on operating profit after tax and performance dividend. The company can return the principal in case of its liquidation only to extent of the residual assets after satisfying to all of its creditors and preferential shareholders. Besides this, investors have to sacrifice the return on their investment in common stock, which could be earned investing fund elsewhere in the next best opportunity.

Study focused on the financial performance where financial activities involve decision regarding

a.   Forecasting and planning of financial requirement

b.   Investment decision

c   Financial decision

Further, Ojha added that the stock price in Nepal is determined more by other factors rather than the financial performance of the concerned company.

2.3 Review from Thesis

Review of thesis is a section of review of literature where various thesis are reviewed which are related its topic and which may be helpful for this study. In this section, some thesis are reviewed which have done on risk and return topic and the objective of this section is to know how the

relation between risk and return is described and measured by different thesis.

Pandey(2003) in his thesis entitled "A study on Risk and Return Analysis of Common Stock Investment" concluded that without proper analysis of individual security, industry and overall market, it is almost impossible to bear the stock market. The main objective of the study is to analyze risk and return of common stock investment, the stock market. The main objective of the study is to analyze risk and return of common stock investment, with special reference to six finance companies is Nepal. Higher risk may have grater possible return. Diversification lowers the portfolio risk, from his analysis, Kathmandu finance Ltd seems undoubtedly the best for investment from the viewpoint of expected return and coefficient of variation and citizen investment trust has a lesser beta from the viewpoint of market sensitivity.

The study performed by Tamang(2003) is "Risk and Return Analysis of Commercial Bank in Nepal". Among different objective the one is to analyze risk and return of commercial bank in Nepal. From his findings, Nepal Bangladesh Bank is placed as the highest return earner and Arab Bank as the lowest earner. From his study, the shares of commercial banks in Nepal are heavily traded in NEPSE; none of the share price is currently priced.

The study of Maharjan (2005) is very closely related to this study on the topic of "Risk and Return Analysis of Commercial Bank in Nepal". Researcher's main objective of the study is to assess the risk associated with return on common stock investment of the listed commercial banks in Nepal stock market. The study is focused on the common stock of

commercial banks. The researcher finds out the banking sector of the biggest one in terms of market capitalization and turnover. Expected return on the common stock of Nepal Bangladesh Bank Ltd is the highest (i.e. 42.17%) and common stock of Nepal SBI Bank Ltd is the lowest (i.e. 19.31%). Common stock of Nepal Bangladesh Bank is the most risky and common stock of Standard Chartered Bank is less risky. The researcher concluded that common stock of Standard Chartered Bank is the best one for investment.

The researcher has recommended that before making an investment decision in stock market, the investors should analyze the market situation carefully by analyzing his/her own risk return attitude, needs and requirements and make several discussions with stockbroker and make one's decision on the basis of reliable information rather than rumor and imagination. Investor can join to investors groups and share experience, ideas and experience to each other.

Rajbhandari(2005) had studied in her thesis entitled "Risk and Return Analysis of Commercial Bank in Nepal". The main objective of the study is to analyze the risk, return and other relevant variables that help in making investment decision. The conclusion of the study is the contribution of the real sector is negligible. Banking and financial sectors occupy majority of pie in terms of capitalization and turnover. Nepalese capital market is not well developed and the movement of the prices mostly is originated of psychological factor. Coverage of media is minimal. The recommendation is investors analyze should clear their interested company's financial information. The regulating body should in this regard act like a watchdog to create a conductive environment. Media coverage about the capital market is virtually not existent. Dissemination

of information plays vital role to lead the capital market towards sustainability, at the same time help increase awareness.

Sharma (2009) studied on 'Risk and Return on common stock investment of commercial banks in Nepal'. From among the population, the study selected four listed commercial Banks by using judgmental sampling method, which is as follows: NABIL Bank Limited, Standard Chartered Bank Limited, Himalayan Bank Limited and Nepal Everest Bank Limited. As there are 17 commercial Banks listed in NEPSE, major findings can be outlined as:

The return is the income received on a stock investment which is usually expressed in percentage. The highest return is seemed with EBL (i.e. 81.35%) which is maximum in the selected banks and the least return is seemed with HBL (31.34%) which is minimum of the selected banks.

Risk is the variability of returns which is measured in terms of standard deviation. On the basis of Standard deviation C.S. of EBL is most risky. Since it has highest S.D. (i.e. 110.34%) and C.S. of HBL is least risky because of it has lowest S.D. (i.e. 18.12%) among the selected listed commercial banks.

By analyzing the C.V, it is found that the C.V. of EBL (i.e. 135.64%) is highest and C.V. of HBL (i.e. 57.82%) is lowest among the selected listed commercial banks. We know that the coefficient of variation is more rational basis of investment decision which measures the risk per unit of return. On the basis of C.V. C.S. of HBL is best among all the studied banks. HBL has 0.5782 unit of risk per unit of return. But C.S. Of EBL has the 1.3564 unit of risk per unit of return.

Systematic risk is defined by the market risk and measured by Beta coefficient (β). Beta coefficient explains the sensitivity or volatility of the stock with market. Beta coefficient of NABIL and EBL are greater than 1,

so these are aggressive type of common stock and SCBL and HBL are less than 1, so these are defensive type of stocks. Beta of NABIL, SCBL, HBL and EBL are 1.3275, 0.5376, 0.6092 and 1.1455 respectively.

Correlation coefficient between all banks is positive that indicated there is high degree of positive correlation between them.

Comparison between expected rate of return and required rate of return identify whether the stock is overpriced or under priced. If RRR is greater than ERR the stock is overpriced. This study shows that all the selected listed commercial banks stocks are under priced. That means their stock value will be increased in near future. All the stocks are in demand. So, investors can buy the common stock of any bank.

Diversification of fund by making a portfolio can reduce unsystematic risk of individual security significantly. If investors select the securities for investment, which have highly negative correlation of returns, the risk can be returns of two stocks in highly positive, risk reduction is not so significant. So portfolio between the C.S. of same sector can not reduce risk properly. In this study, all the banks have positive correlation among their returns. So the portfolio construction of the common stock of these banks will not completely reduce any risk, which is not favorable as optimal portfolio construction is concerned. But using the diversification, there is less risk with comparison to its return. From the point of view of Portfolio, risk and return the Portfolio construction is shows the better.

Wagle (2010) has studied on "Analysis of risk and return on common stock investment of commercial banks in Nepal'. It covers the data from 2000/01-2008/09.Three commercial banks Nepal Investment Bank Limited (NIBL), Himalayan Bank Limited (HBL) and Nabil Bank Limited (NABIL) were taken as sample. Major findings can be outlined as:

Expected return on common stock of NABIL is maximum (50.72%). Similarly expected return of C.S. of HBL is (27.79%) and NIBL is (31.23%).

On the basis of S.D., common stock of NABIL is most risky since it has high S.D. i.e. 0.7839 and C.S of HBL is least because of its lowest S.D. of 0.3741, on the other hand we know that C.V. is more rational basis of investment decision, which measures the risk per unit of return. On the basis of C.V., C.S. of HBL is best among all other banks. HBL has 1.3462 unit of risk per 1 unit of return. But C.S. of NIBL has the highest risk per unit of return.

Beta coefficient explains the sensitivity or volatility of the stock with market. Higher the beta higher the volatility. In the contest, common stock of NABIL is most volatile i.e. β = 1.8684 and common stock of HBL is least volatile i.e. β = 0.9408. The bank's stock, having the beta less than beta coefficient of market (i.e. β_m = 1), defensive stock. We find NIBL and NABIL have aggressive type of common stock. Among them most aggressive seems to be NABIL with highest beta and least aggressive is HBL with lowest beta among three bank's common stock.

This study shows that all the stocks of commercial banks, which are analyzed, are under priced. That means their stock value will increase in a near future. All the stocks are in demand. So, investor can buy the common stock of any bank.

The portfolio return between NIBL and NABIL is high i.e. 36.05% and portfolio return between HBL & NABIL is lower i.e. 8.32%.

The portfolio risk between NIBL and NABIL is high i.e. 58.03% and portfolio risk between HBL and NABIL is lower i.e. 11.45%.

Since the entire bank has positive correlation so bank doesn't reduce any unsystematic risk. Among them, correlation Between NIBL and NABIL has lower i.e.0.5173, so it can be favorable for the investors.

Systematic risk can not be diversified through creation of portfolio. It is occurred due to market factor. Unsystematic risk can be diversified through creation of portfolio. It is occurred due to internal management factor. This study shows that NIBL has high proportion of unsystematic risk i.e. 46.64% which can be minimized from improving internal management. Where as HBL has high proportion of systematic risk i.e. 86.72%. This can not be minimized by improving internal management. C.S. of NIBL is best among these banks due to its highest proportion of unsystematic risk.

2.4 Review from Journals

These days information highway or the internet has becomes the most easily accessible mediums to gain information in any subject matter in the study period different books and article have been consulted.

There is an article in Business Age about outlook of Nepali Share Market. Which is "Fundamentally, the market is in a panic mood backed by dynamic trading pattern. Market psyche is abnormal. Investors are showing the most chaotic behavior since the inception of the Nepal capital market. Market confidence level is down and future outlook is much more uncertain. It is observed that the market is not only experiencing political pressure but is also afraid of global economic disaster which is slowly hitting the sectors like remittance, foreign investment, real estate and so on, the so called 'double – digit growth' dream shared by Maoist – led government has failed as the Asian Development Bank has forecasted Nepal's GDP growth this year to be contained at 3% perhaps, we'll see a crash in real estate sector backed by gloom in the economy with poor confidence level of investors, industrialists and the general people. There is still possibility that quarterly earnings of F/s may miss exert forecast in

their earnings this time. Analyzing these chaotic scenarios, we should expect some miracle in our economy before our stock market takes flight to the bullish territory". (Bhurtel and Pokhrel, 2009)

There is another article in Business Age about market analysis. This is "An analysis of the market in technical term through the moving average shows that the market is very weak with the supply for exchanging the demand. The 200 days simple moving average (SMA) price was overriding the market price. Market prices of the scripts traded were too lower than the 200 days SMA. The NEPSE index pulled down the SMA line throughout the period giving the investors the impression that is still no hope for the market to rebound. Everyone is wondering why the market is going down even through there is a positive fundamental indicator in the form of encouraging dividend declared by some companies. However, there seems to be a consensus that if political, macro – economic and regulatory environment becomes stable, the investor's confidence will be restored and there will be bulls around the street chasing the staff bears. (Chaudary, 2009)

2.5 Research Gap

Globally, there has been keen interest on risk and return analysis of common stock as reviewed from the above study. It is clear that there are various financial institutions associated with risk and return which are to be analyzed carefully and take a rational decision to invest in a share providing more return with less risk. It is only possible from the awareness of investors to analyze various factors linked with the stock.

In Nepalese context, some researches have been carried out relating to risk and return analysis of commercial banks of Nepal. But, the variables which have been used in this research is quite new. Though, many

researches have been carried out on this topics, this type of research using seven years data is rare. There is fundamental difference between those and this present one. The previous researcher focused only on the risk and return aspect of selected commercial banks till 2065/66. However, this study further analyses upto fiscal year 2067/68 taking seven observation data. This research has further tried to identify the correlation among returns of the commercial banks under study which plays a significant role in risk reduction by portfolio construction for investor. By knowing systematic and unsystematic risk, organization wise comparison, those organization managers will be sensible for improving their organization. It is not done by previous researchers.

Most of the previous researches reviewed have been carried out with less than seven years data. Here, in this research seven years observation data has been taken for analysis. This research has been conducted with reference to three sample firms which give the clear vision for all the investors who invest in common stock investment of commercial banks listed in NEPSE. The stock market of Nepal is in its primary stage of stabilization and growth . Most investors in this market are not rationale. Hence, an attempt has been enlighten to fill the gap of research by assessing the risk and return of common stocks of commercial banks of Nepal.

Chapter III
RESEARCH METHODOLOGY

The research methodology is the systematic way of solving research problems. Research methodology refers to the overall research processes;

which a researcher conducts during his/her study. It includes all the procedures from theoretical foundation to the collection and analysis of data. As most of the data are quantitative, the research is based on the scientific models. It is composed of both parts of technical aspect and logical aspect on the basis of historical data. Research is systematic and organizational effort to investigate a specific problem that needs a solution.

3.1 Research Design

This study can be termed as descriptive research having analytical approach. Risk and Return tools, as well as statistical tools with the help of secondary data are used.

The study aims at portraying risk and return of sampled five commercial banks. The study covers the seven years period from the FY 2061/62 to 2067/68. It deals with the common stories of these commercials banks on the basis of available information.

3.2 Sources of Data

The data required for the research is collected from the secondary sources. During the study, informal opinion survey has also been taken with the individual investors, bank officials, Security board of Nepal, staff of Nepal stock exchange and stockbrokers. Data related to the market prices of stocks, market prices of stocks, market capitalization, movement of NEPSE index etc. it is taken from the trading report published by NEPSE and the website of Nepal Stock Exchange (i.e www.nepalstock.com). Annual report of commercial banks and their financial statement are also collected from the respective sample banks. NEPSE periodicals, articles and previous research report etc. has also been considered.

3.3 Population and Sample

The population of the study is all the listed companies in NEPSE index. There are 225 companies listed in NEPSE. They consist of 26 commercial bank, 74 development bank, 21 insurance companies, 72 finance companies, 18 manufacturing companies, 4 hotels, 4 trading companies, 4 hydropower's and 2 others. This study is concentrated in listed commercial banks only. Total listed commercial banks are 26. For this study 7 commercial banks are taken as sample.

Sample banks are as follows:

1. Standard chartered bank Nepal ltd (SCBNL)

2. Nepal investment bank ltd (NIBL)

3. Bank of Kathmandu ltd (BOKL)

4. Himalayan bank ltd (HBL)

5. Nepal SBI bank ltd (SBI)

3.4 Data Analysis Tools

To achieve the objectives of research, this study has used various financial and statistical tools that are necessary to find out results. The following tools shall analyze the data presented in the study. The data presented in the study shall be analyzed by following tools.

3.4.1 Market Price of Stock (p)

Market price of stock is one of the major data of this study. If the market prices of shares of companies are followed then it can be found that there are three types of prices, high, low and closing. For the analysis, single one is needed, so average price (that of high and low) or closing price approaches can be used. Here in this study the closing price is taken as the market price of the stock, which has specific time of span of one year and

the study has focused on annual basis to get the real average volume and price of each transaction on the stock and duration of time of each transaction on the whole year are essential. This is tedious and impossible too considering the data availability and maintenance. Hence, the closing price is viewed as the markets price of stock, which has a specific time span of one year and the study has focused on annual basis.

3.4.2 Dividend (D)

Dividend is relevant during the computation of the rate the return, which is the reward to the shareholders for the investment. If a company declares only the cash dividend, there are no problems to take the dividend amount. But in the company declares stock dividend (Bonus share) of is different to obtain the amount that really shareholders has gained. In these case, they get extra numbers of shares as dividend and simultaneously price of the stock declines as a results of increased numbers of stocks to get a real amount of dividend following model has been used through out

Total dividend amount = Cash dividend + stock dividend % * [Next year's MPS]

3.4.3 Return on Common Stock (R_j)

It is known as realized rate of return or single period rate of return. It is cash received plus price changes in period of stock (capital gain/loss). It is calculated in the form of percentage. It is calculated by adding change in market price with total dividend and then dividing by market price of previous year.

Symbolically

$R_j = (p_t - p_{t-1}) + D_1 / p_{t-1}$

Where,

R= annual rate of return

D_t = cash dividend received at time t.

p_t = price of stock at time t.

p_{t-1} = price of stock at time t-1.

3.4.4 Expected Rate of Return on Common stock $E(R_j)$

One of the major aims of the study is to determine the expected return on the investment in common stock. Generally, this rate is obtained by the arithmetic mean of the part year returns.

Symbolically,

$E(R_j) = R_j /n$

Where,

$E(R_j)$ =Expected rate of return on stock j.

R_j = Return on stock j.

n =numbers of years that the return is taken.

$\quad$ = sign of summation.

3.4.5 Return on Market

It is the percentage increase in NEPSE index. Market return is the average return of the market as the whole. It is calculated as.

$R_m = NI_t - NI_{t-1}/NI_{t-1}$

Where,

R_m = return on market

NI_t = NEPSE index at time t.

NI_{t-1} = NEPSE index at time t-1.

3.4.6 Expected Return on Market, $E(R_m)$

It is average return of future expectation. It is calculated by summing up the past return and dividing by number of samples period.

$E(R_m) = R_m / n$

Where,

$E(R_m)$ = Expected return on market.

R_m = summation of market return.

N = Number of samples period.

3.4.7 Standard Deviation (S.D)

It is a statistical measure of the variability of a set of observation. The symbol is called ( ) sigma. It is the measure the total risk on stock investment. Standard can be calculated using following formulas,

If data given as time series

$$\sigma_j = \quad [R_j - E(R_j)]^2 \, / \, n - 1$$

If data is probability distribution

$$\sigma_j = \sqrt{\sum_{t-1}^{n} \left[R_j - E(R_j) \right]^2 p}$$

Where,

σ_j = Standard Deviation on of return stock j during the time period n.

P_j = Probability distribution of the observation

R_j = Single period rate of return on stock j

$E(R_j)$ = Expected rate of return on stock j

n = Number of years that the return are taken

3.4.8 Coefficient of Variation (C.V)

It is the relative measurement of risk with return. It measures the risk per unit of return. It provides a more meaningful basis for comparison when the expected returns on two alternatives are not the same. There is higher coefficient of variation higher the risk. It is calculated as

C.V. = $\sigma_j \, / \, E(R_j)$

Where,

C.V. = Coefficient of variation of stock

σ_j = Standard deviation of return on stock j

$E(R_j)$ = Expected rate of return on stock j

3.4.9 Beta Coefficient (β)

Beta coefficient shows the market sensitivity of stock. There is higher the beta, grater the sensitivity and reaction to the market movement. Beta coefficient of a particular stock will be less than equal or more than 1, but the beta for market will be always 1.

$$\beta_j = \text{Cov}(R_j, R_m) / \sigma_m^2$$

Where,

β_j = Beta coefficient of stock j

σ_m^2 = Variance of market return

$\text{Cov}(R_j, R_m)$ = Covariance between return on stock j and return on market

$$= \sum [R_j - E(R_j)][R_m - E(R_m)] / n - 1$$

3.4.10 Correlation Coefficient (ρ_{ij})

Two variances are correlated when they related that the change in the value of one variable is accompanied by change in the value of other. Correlation may be positive or negative. If returns on two securities are negatively correlated which combined in portfolio reduces the risk. If securities are positively correlated risk cannot be reduce. Correlation coefficient is negative or positive which ranges from +1 to -1. It can be calculated as

$$\rho_{ij} = \text{Cov}_{ij} / \sigma_i \sigma_i$$

Where,

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

Cov_{ij} = Covariance between securities i and j

$\sigma_i \sigma_i$ = Standard deviation of returns for securities i and j

3.4.11 Portfolio Risk and Return

Portfolio is combination of individual or a group of assets. Investors have different types of investment opportunity but they have limited resource for investment so that investors have to choose that investment opportunity which maximizes return for a given level of risk or minimize risk for a given level of return. Thus the combination of these investments is called portfolio.

-Portfolio Return, $E(R_p)$

The expected return on a portfolio is simply the weighted average of expected returns on the individual assets in the portfolio with weights being the faction of the total portfolio invested in each asset.

Symbolically,

$E(R_p) = W_i E(R_i) + W_j E(R_j)$

Where,

$E(R_p)$ = Expected return on portfolio

W_i = Proportion of wealth invested i assets

W_j = Proportion of wealth invested in j assets

$E(R_i)$ = Expected return on i assets

$E(Rj)$ = Expected return on j assets

-Portfolio Risk

It is the combined standard deviation of individual stock return. It is the risk of individual securities plus covariance between the securities. The formula for the calculation of portfolio risk for two assets case in given by

$\sigma_p = \sqrt{\sigma_i^2 W_i^2 + \sigma_j^2 W_j^2 + 2W_i W_j Cov(R_i R_j)}$

Where,

σ_p = Standard deviation of stock i and j

σ_i^2 = Variance of assets i

σ_j^2 = Variance of assets j

W_i = Proportion of assets i

W_j = Proportion of assets j

Cov (R_iR_j) = Covariance between the return of assets i and j

3.4.12 Risk Minimizing portfolio

It is the portfolio with lowest level of risk in the efficient frontier. In other word it is the proportion of stock that minimizes the risk. In two stock portfolio the optimal weight to invest in stock i and j are calculated as follows

$W_i = \sigma_j - \text{Cov} (R_iR_j) / \sigma_i^2 + \sigma_j^2 - 2\text{Cov} (R_i,R_j)$

$W_j = 1 - W_i$

Where,

W_i = Optimal weight to invest in stock i

W_j = Optimal weight to invest to in stock j

σ_i^2 = Variance of stock i

σ_j^2 = Variance of stock j

Cov (R_i,R_j) = Covariance of returns between stock i and j

3.4.13 Partitioning of Total Risk

Systematic risk proportion (ρ^2) = $\beta_j^2 \sigma_m^2 / \sigma_j^2$

Unsystematic risk proportion (1- ρ^2) = Var(e) / σ_j^2

Where,

σ_j^2 = Variance of stock j

β_j^2 = Square beta of stock j

σ_m^2 = Variance of market return

Var(e) = residual variance

3.4.14 The Optimal Portfolio

The optimal portfolio for each investor is found at the tangency point between the efficient set of portfolios and one of the investor's indifference curves. The tangency point makes the highest level of satisfaction an investor can attain from efficient portfolio. The portfolio theory is a description of how rational investors should build the efficient portfolios and select the optimal portfolio. The Capital Assets Pricing Model derives the relationship between the expected return and systematic risk of individual securities and portfolios. The CAPM are calculated as follows:

$Ki = Rf + [E(Rm) – Rf)$ i

Where

Ki = Required rate of return on the ith stock

Rf = Risk free ratre of return

$E(Rm)$ = The expected rate of return on market portfolio

 i **=** Beta of ith stock

3.4.15 Regression Analysis

Regression analysis is a statistical device used to establish the functional relationship between two or more than two variables. It is simply a relationship between dependent variable and independent variables. This analysis helps to identify sensitivity of return to various financial variables. In this model, we study the following two relationships:

1. Simple Regression Model
2. Multiple Regression Model

In this model, we use the least square regression equation model.

- **Simple Regression Model**

In this model, one dependent variable and one independent variable is used to measure the regression. If y is a linear function of x, y on x can be expressed as:

Y = a + bx

Where,

Y = Dependent variable

X = independent variable

a,b = Regression parameters

- **Multiple Regression Model**

The regression equation with one dependent variable and there are more than one independent variables is called multiple regressions. Multiple regression equation with two independent tipple regressions can be expressed as:

$Y = a + b_1X_1 + b_2X_2$

To test the significance of model as well as variables and to prove its validity we try to test the standard error of estimate, coefficient of determination and F-statistic.

Chapter IV
DATA PRESENTATION AND ANALYSIS

This chapter is the main part of study. In this chapter the effort has been made to analyze risk and return on common stock investment, which includes, detail data of market price of share and dividend of each, selected commercial banks, their interpretation and analysis. With

reference to the various readings and literature review in the preceding chapter effort is made to analyze the recent Nepalese stock market movement to the listed commercial banks. There is analysis of data consists of organizing, tabulating and assessing financial and statistical result. Different table and diagrams are used to make the result easily understandable.

4.1 Analysis of Individual Commercial Banks

Five commercial banks are taken as sample for study. There are 26 commercial bank listed in NEPSE. Every sample bank's common stock risk and return are analyzed properly. Market price and dividend per share of each selected banks are shown in the table 4.1.

Risk and return is considered to be one of the best ways to analysis the behavior of changing market price of common stock. In this analysis, it is attempted to find out periodical realized returns to the investors, its expected return or average rate of return, standard deviation, co – efficient of variation.

In the following paragraph, each banks are introduced and their common stock's risk and return are analyzed here.

Table No. 4.1

Sample companies MPS and DPS

Company Name			Financial year							
			060/61	061/62	062/63	063/64	064/65	065/66	066/67	067/68
SCBL	MPS	Closing	1745	2345	3775	5900	6830	6010	2384	1252
	DPS	Cash(Rs.)	110	120	130	80	80	50	55	50
		Stock (%)	0	0	10	50	50	50	15	0
NIBL	MPS	Closing	940	1260	1729	1729	2450	1388	705	515

51

	DPS	Cash(Rs.)	15	20	5	5	7.5	20	25	25
		Stock (%)	0	35.46	25	25	33	0	0	25
BOK	MPS	Closing	332	430	850	1375	2350	1825	840	570
	DPS	Cash(Rs.)	10	15	18	20	2.11	7.37	15	16.75
		Stock (%)	0	0	12	0	40	40	15	18
HBL	MPS	Closing	840	920	1100	1740	1980	1760	816	741
	DPS	Cash(Rs.)	0	11.58	30	15	25	12	11.84	16.84
		Stock (%)	20	20	5	25	20	31.56	25	20
SBI	MPS	Closing	307	335	612	1176	1511	1900	741	565
	DPS	Cash(Rs.)	0	0	5	12.59	0	2.11	5	5
		Stock (%)	0	0	0	35	0	40	15	12.5

Data source: NEPSE Report, Bank's AGM Report

4.1.1 Standard Chartered Bank Nepal Limited (SCBNL)

It has been in operation in Nepal since 1987 when it was initially registered as a joint-venture operation. Today the Bank is an integral part of Standard Chartered Group who has 75% ownership in the company with 25% shares owned by the Nepalese public. The Bank enjoys the status the largest international bank currently operating in Nepal. An integral part of the only international banking Group currently operating in Nepal, the Bank enjoys an impeccable reputation of a leading financial institution in the country. With 11 points of representation (7 Branches) and 9 ATMs across the Kingdom and with over 300 local staff, Standard Chartered Bank Nepal Ltd. is in a position to service its customers through a large domestic network. In addition to which the global network of Standard Chartered Group gives the Bank the unique opportunity to provide truly international banking in Nepal. Standard Chartered Bank Nepal Limited, offers a full range of banking products and services in Wholesale and Consumer banking, catering to a wide range of customers from individuals, to mid-market local corporates to multinationals and

large public sector companies, as well as embassies, aid agencies, airlines, hotels and government corporations. The Bank has been the pioneer in introducing customer focused products and services in the country and aspires to continue to be a leader in introducing new products and highest level of service delivery. It is the first Bank in Nepal that has implemented the Anti-Money Laundering policy and applied the "Know Your Customer " procedure on all the customer accounts.

Following table 4.2 represents the market price and dividend per share of NCBNL for the purpose of risk and return analysis.

Table 4.2

MPS and DPS data of SCBNL

Financial Year	Market price per share	Dividend per share		
	Closing price (Rs.)	Cash (Rs.)	Stock (%)	Total (Rs.)
060/61	1745	110	0	110
061/62	2345	120	0	120
062/63	3775	130	10	720*
063/64	5900	80	50	3495*
064/65	6830	80	50	3085*
065/66	6010	50	50	1242*
066/67	2384	55	15	242.8*
067/68	1252	50	0	50

Data source: NEPSE Index and AGM Report of SCBNL

Total dividend = Cash dividend + % of stock dividend x Next year MPS

* 130 + 10% of 5900 = Rs. 720

* 80 + 50% of 6830 = Rs. 3495

* 80 + 50% of 6010 = Rs. 3085

* 50 + 50% of 2384 = Rs. 1242

*55 + 15% of 1252 = Rs. 242.8
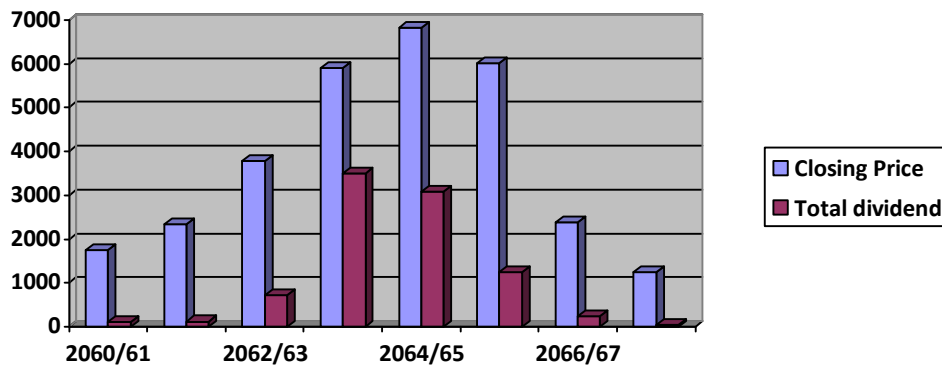
Data Source: Table No. 4.2

Price is maximum in Fy 2064/065 and lowest in Fy 2067/068. It seems the bonus share can't affect the share price.

-Rate of Return, Expected rate of Return, Standard Deviation, Coefficient of Variation and Trend Line of Rate of Return of SCBNL
Closing price and dividend amount are used to calculate realized rate of return from each year. Table 4.3 shows the calculation of yearly realized return, expected return, standard deviation and coefficient of variation of returns.

Table No 4.3

Market Rate of Returns, Expected Return, SD and C.V of the common

stock of SCBNL

Fy	Closing price(P)	Dividend (D)	$R = \dfrac{Dt + (Pt - Pt\text{-}1)}{Pt\text{-}1}$	$[R - E(R)]$	$[R - E(R)]^2$
2060/61	1745	110	-	-	-
2061/62	2345	120	0.4126	0.0492	0.0024

2062/63	3775	720	0.9168	0.5534	03063
2063/64	5900	3495	1.4887	1.1253	1.2663
2064/65	6830	3085	0.6805	0.3171	0.1006
2065/66	6010	1647.5	0.0618	0.3016	0.0910
2066/67	2384	242.8	-0.5630	-0.9264	0.8582
2067/68	1252	50	-0.4539	-0.8173	0.6680
Total			2.5435		3.2928

Data Sources: Table No 4.2

We have,

Expected Return $E(R) = E(R) / n = 2.5435 / 7 = 0.3634$

Standard Deviation $( ) = \quad E[R – E(R)]^2 / n – 1 = \quad 3.2928/7 – 1$

$= 0.7408$

Coefficient of variation (C.V) = $/ E(R) = 0.7408 / 0.3634 = 2.039$

Expected rate of return (Trend Value) for each year are calculated on the basis of rate of return on common stock of SCBNL respective year by using least square method as follows.

Table No. 4.4

Year wise Expected Rate of Return on SCBNL

Fy	Rate of Return(Y)	Deviation From Fy 064/65(X)	XY	X^2	Trend Value (Yc)
2061/62	0.4126	-3	-1.2378	9	1.1119
2062/63	0.9168	-2	-1.8336	4	0.8624

2063/64	1.4887	-1	-1.4887	1	0.6129
2064/65	0.6805	0	0	0	0.3634
2065/66	0.0618	1	0.0618	1	0.1139
2066/67	-0.5630	2	-1.126	4	-0.1356
2067/68	-0.4539	3	-1.3617	9	-0.3851
Total	2.5435	0	-6.986	28	

Data Sources: Table No. 4.3

We have,

The equation of trend is $Yc = a + bX$

As $\Sigma x = 0$, $a = \Sigma Y/n = 2.5435/7 = 0.3634$

$b = \Sigma XY/\Sigma X^2 = -6.986/28 = -0.2495$

Here, Trend line $Yc = a + bX = 0.3634 + (-0.2495)X$

When $X = -3$, $Yc = 0.3634 + (-0.2495)(-3) = 1.1119$

When $X = -2$, $Yc = 0.3634 + (-0.2495))-2) = 0.8624$

When $X = -1$, $Yc = 0.3634 + (-0.2495)(-1) = 0.6129$
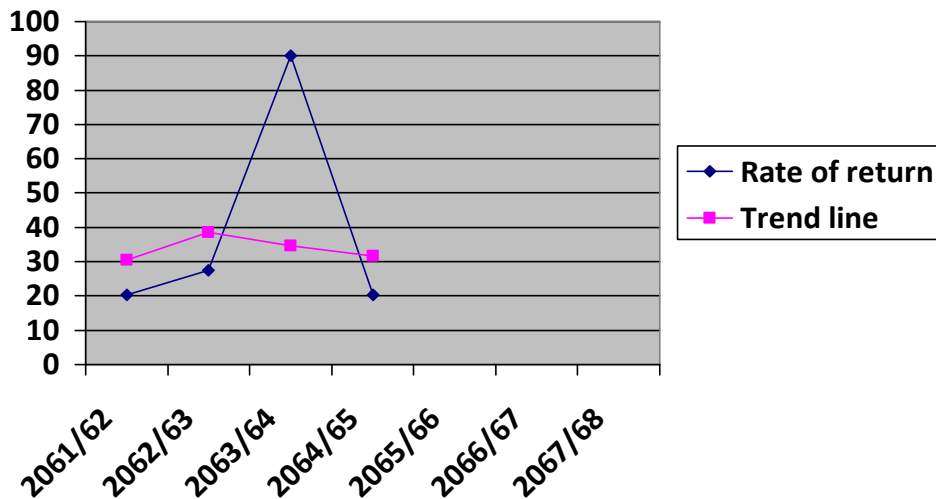
When $X = 0$, $Yc = 0.3634 + (-0.2495)(0) = 0.3634$

When $X = 1$, $Yc = 0.3634 + (-0.2495)(1) = 0.1139$

When $X = 2$, $Yc = 0.3634 + (-0.2495)(2) = -0.1356$

When $X = 3$, $Yc = 0.3634 + (-0.2495)(3) = -0.3851$

Diagram: 4.2

Movement of Stocks Rate of Return and Trend Line of SCBNL

The above diagram shows the movement of common stock of SCBNL between rate of return (R) and Trend Line. In the year 2063/64, Rate of Return is high, after and before that it started to move down until 2066/67 and little up on 2067/68 due to large dividend payment. The trend line shows in the beginning high in Fy 2061/62 to down ward movement and it slowly points downward until 2067/68.

4.1.2 Nepal Investment Bank Ltd.

NIBL, previously Nepal Indosuez Bank Ltd., was established in 1986 as a joint venture between Nepalese and French partners. The French partner (holding 50% of the capital of NIBL) was Credit Agricole Indosuez, a subsidiary of one the largest banking group in the world. With the decision of Credit Agricole Indosuez to divest, a group of companies comprising of bankers, professionals, industrialists and businessmen, has acquired on April 2002 the 50% shareholding of Credit Agricole Indosuez in Nepal Indosuez Bank Ltd. The name of the bank has been changed to Nepal Investment Bank Ltd. upon approval of bank's Annual General Meeting, Nepal Rastra Bank and Company Registrar's office with the following shareholding structure A group of companies holding 50% of

57

the capital Rashtriya Banijya Bank holding 15% of the Capital. Rashtriya Beema Sansthan holding the same percentage. The remaining 20% being held by the General Public (which means that NIBL is a Company listed on the Nepal Stock Exchange).

The following table 4.5 represents the market price and dividend per share of NIB for the purpose of risk and return analysis.

Table No. 4.5

Market price per Share and Dividend per share Data of NIB

Financial Year	Market price per share	Dividend per share		
	Closing price (Rs.)	Cash Rs.	Stock (%)	Total Rs.
060/61	940	15	0	15
061/62	1260	20	35.46	633.1034
062/63	1729	5	25	437.25
063/64	1729	5	25	617.5
064/65	2450	7.5	33	465.54
065/66	1388	20	0	20
066/67	705	25	0	25
067/68	515	25	25	155.75

Data Source: NEPSE Index and AGM report of NIB

*20 + 1729 x 35.46% = 633.1034
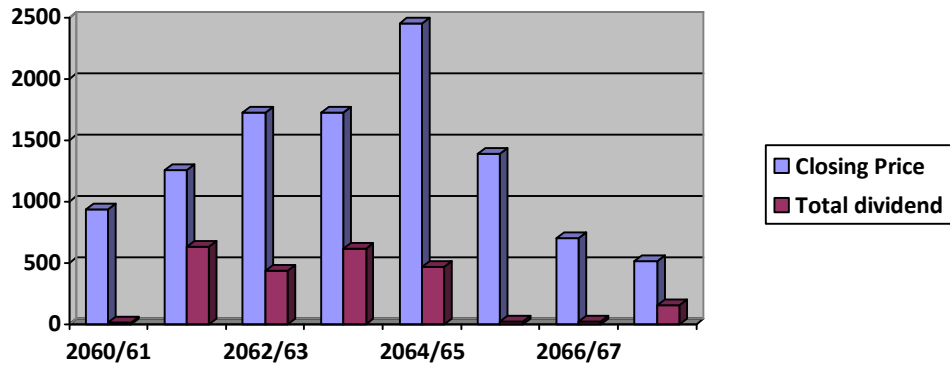
*5 + 1729 x 25%   = 437.25

*5 + 2450 x 25%   = 617.5

*7.5 + 1388 x 33%   = 465.54

*25+523 x 25% = 155.75

Diagram 4.3

Market price of Share and Dividend per Share of NIB

are shown below

Data Source: Table No 4.5.

Market price per share is Maximum in financial year 2064/65 and lowest in financial year 2067/68 and total dividend is more in 2061/62 and lesser in 2060/61.

-Rate of Return, Expected Return, Standard Deviation, Coefficient of Variation and Trend Line of Rate of Returns of NIB.

Rate of return for each year are calculated on the basis of closing price of common stock and dividend amounts of respective year. In Table 4.6, the calculation of year wise rate of return, expected rate of return, standard deviation and coefficient of variation of return are shown.

Table No. 4.6

Market Rate of Return, Expected Rate of Return, S.D and C.V of the common stock of NIB Bank.

Fy	Closing price(P)	Dividend (D)	$R = \dfrac{Dt + (Pt - Pt_{-1})}{Pt_{-1}}$	$[R - E(R)]$	$[R - E(R)]^2$
2060/61	940	15	-	-	-
2061/62	1260	633.1034	1.0139	0.7522	0.5658
2062/63	1729	437.25	0.7192	0.4575	0.2093
2063/64	1729	617.5	0.3571	-0.0954	0.0091
2064/65	2450	465.54	0.6863	0.4246	0.1803
2065/66	1388	20	-0.4253	-0.687	0.4720
2066/67	705	25	-0.4706	-0.7323	0.5363
2067/68	515	155.75	-0.0486	-0.3103	0.0963
Total			1.832		2.0691

Data Source: Table No. 4.5

We have,

Expected Return $E(R) = E(R) / n = 1.832 / 7 = 0.2617$

Standard Deviation $(\ ) = \sqrt{E[R - E(R)]^2 / n - 1} = \sqrt{2.0691/7-1}$

$= 0.5872$

Coefficient of variation $(C.V) = \ / E(R) = 0.5872 / 0.2617 = 2.2438$

Rate of return (Trend Value) for each year are calculated on the basis of rate of return on common stock of NIBL respective year by using least square method as follows.

Table No. 4.7

Year wise Expected Rate of Returns Data of NIBL

Fy	Rate of Return(Y)	Deviation From Fy 064/65(X)	XY	X^2	Trend Value (Yc)
2061/62	1.0139	-3	-3.0417	9	0.9421
2062/63	0.7192	-2	-1.4384	4	0.7153
2063/64	0.3571	-1	-0.3571	1	0.4885
2064/65	0.6863	0	0	0	0.2617
2065/66	-0.4253	1	-0.4253	1	0.0349
2066/67	-0.4706	2	-0.9412	4	-0.1919
2067/68	-0.0486	3	-0.1458	9	-0.4187
Total	1.832	0	-6.3495	28	

Data Source: Table 4.6

We have,

The equation of trend is Yc = a + bX

As $\sum x = 0$, a = EY/n = 1.832/7 = 0.2617

b = $\sum XY / \sum X^2$ = -6.3495/28 = -0.2268

Here,Trend line Yc = a + bX = 0.2617 + (-0.2268)X

When X= -3, Yc = 0.2617 + (-0.2268)(-3) = 0.9421

When X= -2, Yc = 0.2617+ (-0.2268)(-2) = 0.7153

When X= -1, Yc = 0.2617 + (-0.2268)(-1) = 0.4885
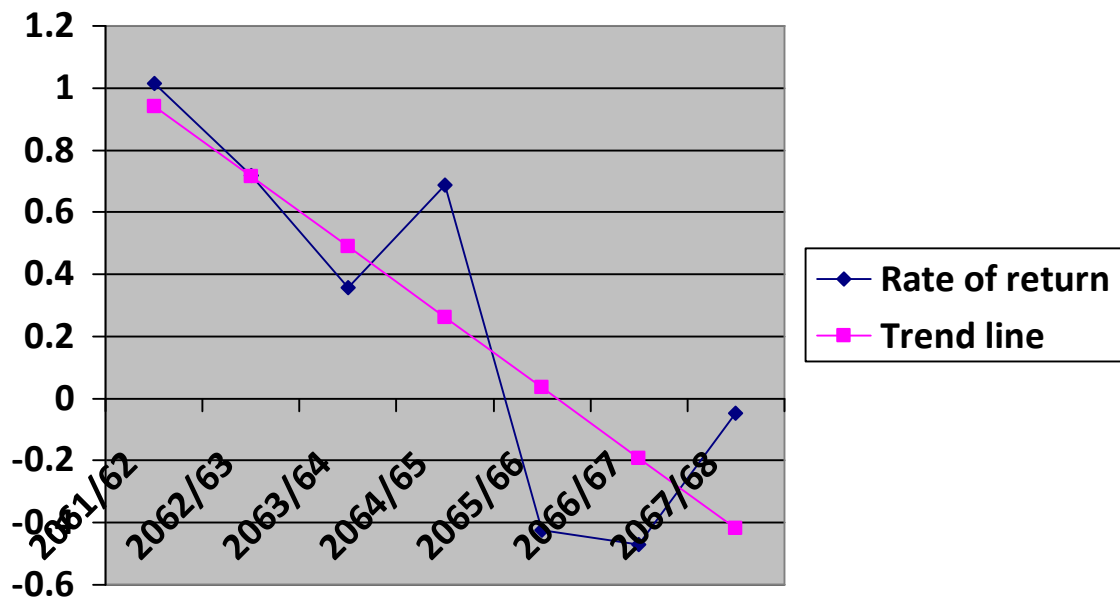
When X= 0, Yc = 0.2617 + (-0.2268)(0) = 0.2617

When X= 1, Yc = 0.2617 + (-0.2268)(1) = 0.0349

When X= 2, Yc = 0.2617 + (-0.2268)(2) = -0.1919

When X= 3, Yc = 0.2617 + (-0.2268)(3) = -0.4187

Diagram 4.4

Movement of Stocks Rate of return and Trend Line of NIBL

Data Source: Table No. 4.7

Above diagram shows the movement of common stock of NIBL rate of return (R) and Trend line (Yc). In the beginning Fy 2061/62, R is high after it goes downward until 2063/64 and after that it improved in Fy 2064/65 and it goes firstly downward to negative in the year Fy 2065/66. Similarly the trend line shows in the beginning high in Fy 2061/62 and it goes slowly downward till 2067/68.

4.1.3 Bank of Kathmandu (BOKL)

BOK has today become a landmark in the Nepalese banking sector by being among the few commercial banks which is entirely managed by Nepalese professionals and owned by the general public. BOK started its operation in March 1995 with the objective to stimulate the Nepalese economy and take it to newer heights. BOK also aims to facilitate the nation's economy and to become more competitive globally.

The following table 4.8 represents the market price and dividend per share of BOK for the purpose of risk and return analysis.

Table No. 4.8

Market price per Share and Dividend per share Data of BOK

Financial Year	Market price per share	Dividend per share		
	Closing price (Rs.)	Cash (Rs.)	Stock (%)	Total (Rs.)
060/61	332	10	0	10
061/62	430	15	0	15
062/63	850	18	12	183
063/64	1375	20	0	20
064/65	2350	2.11	40	732.11
065/66	1825	7.37	40	328.17
066/67	840	15	15	100.5
067/68	570	16.75	18	119.71

Data Sources: NEPSE Index and AGM Report of BOK

*18 + 1375 x 12% = 183

*2.11 + 1825 x 40% = 732

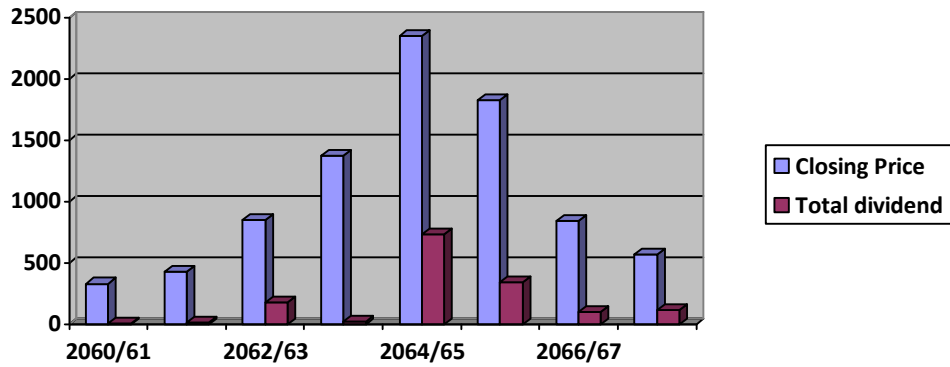**7.37 + 802 x 40% = 328.17

*15+ 570x 15% = 100.5

*16.75 + 572 x 18% =119.71

Diagram 4.5

Market prices of share and Dividend per share of BOK are shown below.

Data Sources: Table No. 4.8

Market price per share is maximum in Fy 2064/65 and market price is lowest in the financial year 2060/61.

-Rate of Return, Expected Return, Standard deviation, Coefficient of Variation and Trend Line of Rate of Return of BOK.

Rate of return for each year are calculated for the basis of closing price of common stock and dividend amount of respective year. Table 4.9 shows the calculation of year wise rate of return, expected rate of return, standard deviation and coefficient of variation of return.

Table No. 4.9

Rate of Return, Expected Rate of Return, S.D, CV of the common stock of BOK.

Fy	Closing price(P)	Dividend (D)	$R = \dfrac{Dt + (Pt - Pt_{-1})}{Pt_{-1}}$	$[R - E(R)]$	$[R - E(R)]^2$
2060/61	332	10	-	-	-
2061/62	430	15	0.3404	-0.0696	0.0048
2062/63	850	183	1.4023	0.9923	0.9847
2063/64	1375	20	0.6412	0.2312	0.0535
2064/65	2350	732.11	1.2415	0.8315	0.6914
2065/66	1825	343.37	-0.0077	-0.4177	0.1745
2066/67	840	100.5	-0.4847	-0.8947	0.8005
2067/68	570	119.71	-0.1789	-0.5889	0.3468
Total			2.8703		3.0562

Data Sources: Table No. 4.8

We have,

Expected Return $E(R) = E(R) / n = 2.8703 / 7 = 0.41$

Standard Deviation ( ) = $E[R - E(R)]^2 / n - 1 = 3.0562/7 - 1$

$= 0.7137$

Coefficient of variation (C.V) = $/ E(R) = 0.7137 / 0.41 = 1.7407$

Rate of return (Trend Value) for each year are calculated on the basis of rate of return on common stock of BOK respective year by using least square method as follows. Table 4.10 shows the calculation of year wise realized rate of return or trend value.

Table No. 4.10

Year wise Expected Rate if Returns Data of BOK

Fy	Rate of Return(Y)	Deviation From Fy 063/64(X)	XY	X^2	Trend Value (Yc)
2061/62	0.3404	-3	-1.0212	9	0.9254
2062/63	1.4023	-2	-2.8046	4	0.7576
2063/64	0.6412	-1	-0.6412	1	0.5898
2064/65	1.2415	0	0	0	0.4220
2065/66	-0.0077	1	-0.0077	1	0.2542
2066/67	-0.4847	2	-0.9694	4	0.0864
2067/68	-0.1789	3	-0.5367	9	-0.0814
Total	2.9541	0	-4.6984	28	

Data Source: Table 4.9

We have,

The equation of trend is Yc = a + bX

As $\sum x = 0$, a = $\sum Y/n$ = 2.9541/7 = 0.4220

b = $\sum XY / \sum X^2$ = -4.6984/28 = -0.1678

Here,

Trend line Yc = a + bX = 0.4220 + (-0.1678)X

When X= -3, Yc = 0.4220 + (-0.1678) (-3) = 0.9254

When X= -2, Yc = 0.4220 + (-0.1678) (-2) = 0.7576

When X= -1, Yc = 0.4220 + (-0.1678) (-1) = 0.5898
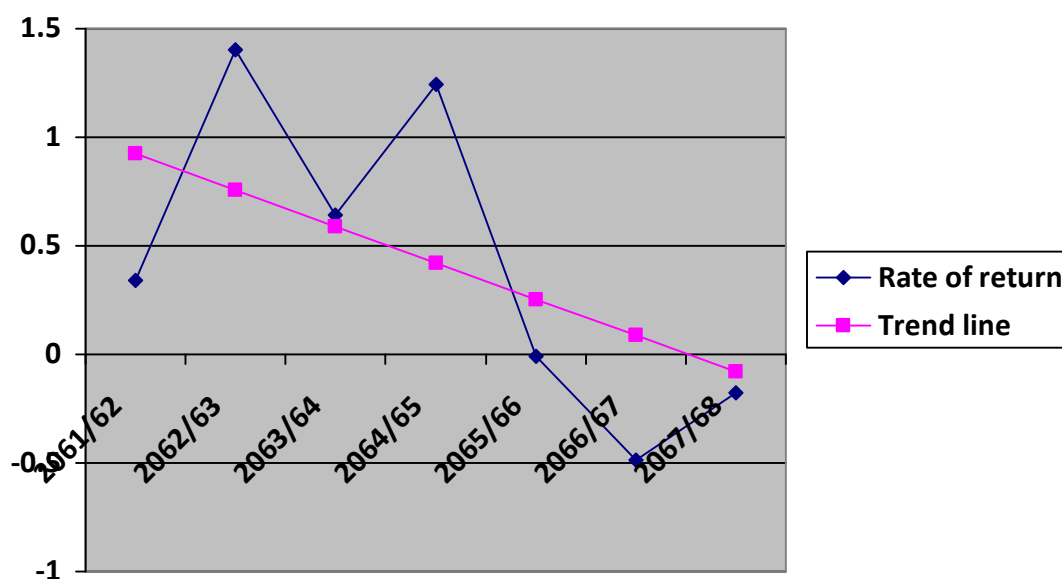
When X= 0, Yc = 0.4220 + (-0.1678) (0) = 0.4220

When X= 1, Yc = 0.4220 + (-0.1678) (1) = 0.2542

When X= 2, Yc = 0.4220 + (-0.1678) (2) = 0.0864

When X= 3, Yc = 0.4220 + (-0.1678) (3) = -0.0814

Diagram 4.6

Movement of Stocks Rate of Return and Trend Line of BOK

Data Source: Table No. 4.10

The above diagram 4.6 shows the movement of common stock of BOK Rate of return (R) and trend line. Here, in the beginning (FY 2062/63), R is high but it moved downward in (Fy 2063/64) and again increase in year 2064/65. In other fiscal year, it moves down.However, it is upward in 2067/68 due to high payment of dividend. The trend line (Yc) in the beginning is high but it started to move down ward slowly.

4.1.4 Himalayan Bank Ltd. (HBL)

HBL was established in 1993 in joint venture with Habib Bank Limited of Pakistan. Products such as Premium Savings Account, HBL Proprietary Card and Millionaire Deposit Scheme besides services such as ATMs and Tele-banking were first introduced by HBL.The most recent rating of HBL by Bankers Almanac as country¿s number 1 Bank easily confirms our claim.All Branches of HBL are integrated into Globus (developed by Temenos), the single Banking software where the Bank has made substantial investments. This has helped the Bank provide services like

`Any Branch Banking Facility¿, Internet Banking and SMS Banking. Living up to the expectations and aspirations of the Customers and other stakeholders of being innovative, Millionaire Deposit Scheme, Small Business Enterprises Loan, Pre-paid Visa Card, International Travel Quota Credit Card, Consumer Finance through Credit Card and online TOEFL, SAT, IELTS, etc. fee payment facility are some of the products and services. HBL also has a dedicated offsite "Disaster Recovery Management System". Looking at the number of Nepalese workers abroad and their need for formal money transfer channel; HBL has developed exclusive and proprietary online money transfer software-HimalRemitTM. All this only reflects that HBL has an outside-in rather than inside-out approach where Customers¿ needs and wants stand first.

We, a team of nearly 580 people, move, lend, invest and protect money of over 300,000 customers nationally and worldwide. Since its inception on July 7, 1993, Bank is continuously upgrading quality of its service delivery and customer satisfaction with the help of state-of-the-art technology.

Extending the reach to 27 districts through our 59 physical outlets including 50 branches, 6 extension counters and three administrative offices, we are among largest private banks in Nepal. In addition, we serve our valued customers through e-delivery points like Mobile Banking, Automated Teller Machines (ATMs) and Online Banking service.

We work as subsidiary of State Bank of India-India's largest bank in almost any benchmark and business parameters, with over 203 years of history and expertise in banking-which has 55 percent of ownership and rest held by a local partner Employee Provident Fund (15%) and general

public(30%).

In terms of the Technical Services Agreement concluded between SBI and the NSBL, SBI provides management support to the bank through its expatriate officers including Managing Director who is also the CEO of the Bank. Central Management Committee (CENMAC) consisting of the Managing Director, Chief Operating Officer, Chief Financial Officer and Chief Credit Officer oversees the overall banking operations in the Bank.

Following table 4.11 represents the market price and dividend purchase of HBL for the purpose of risk and return analysis.

Table No. 4.11

Market price per share and Dividend per share data of HBL

Financial Year	Market price per share	Dividend per share		
	Closing price (Rs.)	Cash (Rs.)	Stock (%)	Total (Rs.)
060/61	840	0	20	184
061/62	920	11.58	20	231.58
062/63	1100	30	5	117
063/64	1740	15	25	510
064/65	1980	25	20	377
065/66	1760	12	31.56	269.53
066/67	816	11.84	25	155.59
067/68	575	16.84	20	136.84

Data Sources: NEPSE Index and AGM Report of HBL

* 0 + 20% of 920 = 184

* 11.58 + 20% of 1100 = 231.58

69

* 30 + 5% of 1740 = 117

* 15 + 25% of 1980 = 510

* 25 + 20% of 1760 = 377

** 12 + 31.56% of 816 = 269.53

*16.84 + 20% 0f 600 =136.84

Diagram 4.7

Market Price per Share and Dividend per Share of HBL are shown below:
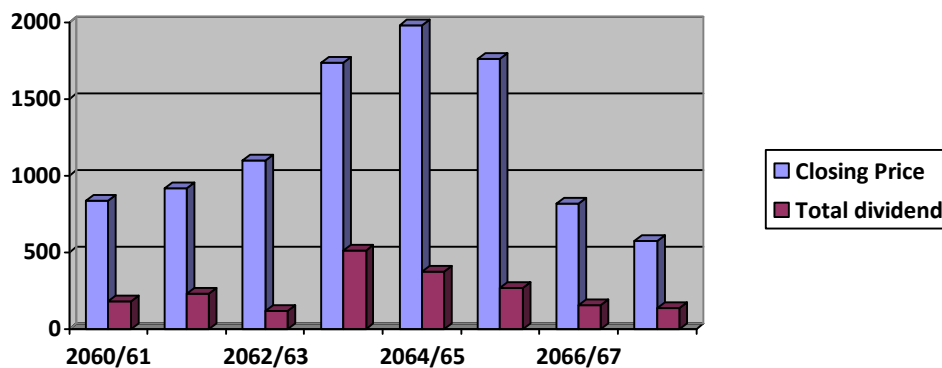
Data Source: Table No. 4.11

Market Price per share is maximum in Fy 2064/65 and lowest in Fy 2067/68.

-Rate of Return, Expected Return, Standard Deviation, Coefficient of Variation and Trend Line of Rate of Returns of HBL

Rate of return for each year are calculated for the basis of closing price of common stock and dividend amounts of respective year. Table 4.15 shows the calculation of year wise rate of return, expected rate of return, standard deviation and coefficient of variation or return.

Table No 4.12

Rate of Return, Expected rate of Return, S.D, CV, of the Common Stock of HBL

Fy	Closing price(P)	Dividend (D)	$R = \dfrac{D_t + (P_t - P_{t-1})}{P_{t-1}}$	$[R - E(R)]$	$[R - E(R)]^2$
2060/61	840	184	-	-	-
2061/62	920	231.58	0.3709	0.118	0.0139
2062/63	1100	117	0.3228	0.0699	0.0049
2063/64	1740	510	1.0455	0.7926	0.6282
2064/65	1980	377	0.3546	0.1017	0.0103
2065/66	1760	269.53	0.0250	-0.2279	0.0519
2066/67	816	197.09	-0.4244	-0.6773	0.4587
2067/68	741	136.84	0.0758	-0.1771	0.01314
Total			1.7702		1.1993

Data Sources: Table No. 4.11

We have,

Expected Return $E(R) = E(R) / n = 1.7702 / 7 = 0.2529$

Standard Deviation ( ) = $E[R - E(R)]^2 / n - 1 = $ 1.1993/7 – 1 = 0.4471

Coefficient of variation (C.V) = / E(R) = 0.4471 / 0.2529 = 1.7679

Rate of return (Trend Value) for each year are calculated on the basis of rate of return on common stock of HBL respective year by using least square method as follows. Table 4.13 shows the calculation of year wise realized rate of return or trend value.

Table No. 4.13

Year wise Expected Rate if Returns Data of HBL

Fy	Rate of Return(Y)	Deviation From Fy 063/64(X)	XY	X^2	Trend Value (Yc)
2061/62	0.3709	-3	-1.1127	9	0.6167
2062/63	0.3228	-2	-0.6456	4	0.4957
2063/64	1.0455	-1	-1.0455	1	0.3743
2064/65	0.3546	0	0	0	0.2529
2065/66	0.0250	1	0.0250	1	0.1315
2066/67	-0.4244	2	-0.8488	4	0.0101
2067/68	0.0758	3	0.2274	9	-0.1113
Total	1.7702	0	-3.4002	28	

Data Source: Table 4.12

We have,

The equation of trend is $Yc = a + bX$

As $\Sigma x = 0$, $a = \Sigma Y/n = 1.7702/7 = 0.2529$

$b = \Sigma XY/\Sigma X^2 = -3.4002/28 = -0.1214$

Here,

Trend line $Yc = a + bX = 0.2529 + (-0.1214)X$

When X= -3, $Yc = 0.2529 + (-0.1214)(-3) = 0.6171$

When X= -2, $Yc = 0.2529 + (-0.1214)(-2) = 0.4957$

When X= -1, $Yc = 0.2529 + (-0.1214)(-1) = 0.3743$

When X= 0, $Yc = 0.2529 + (-0.1214)(0) = 0.2529$

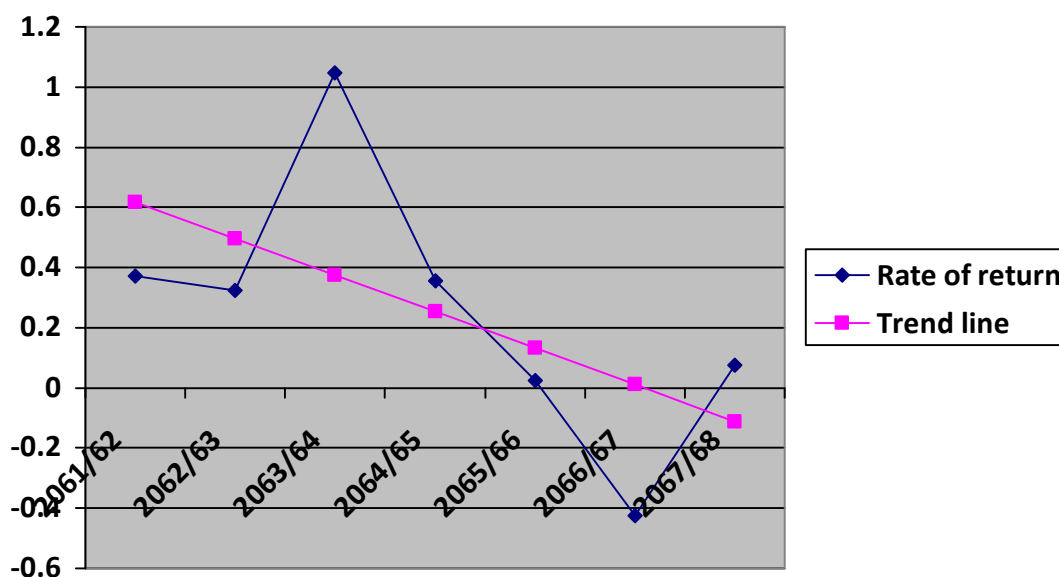When X= 1, $Yc = 0.2529 + (-0.1214)(1) = 0.1315$

When X= 2, $Yc = 0.2529 + (-0.1214)(2) = 0.0101$

When X= 3, $Yc = 0.2529 + (-0.1214)(3) = -0.1113$

Diagram 4.8

Movement of Stocks Rate of Return and Trend Line of HBL

Data Source: Table No. 4.13

The diagram 4.8 shows the movement of common stock of HBL rate of returns and trend line. In the Fy 2063/64, R is high but the R is lowest in the year 2066/67 and after then it increases . The trend line is high in the year 2061/62 and slowly downward until 2067/68.

4.1.5 Nepal SBI Bank Ltd (SBI)

Nepal SBI Bank Ltd is another joint venture of state bank of India and Nepali promoters, was registered under the company act 1964 in 1993. The bank is managed by state bank of India under joint venture and technical services agreement signed between it and Nepali promoters viz, employer's provident fund and agriculture development bank Nepal. A main objective of the bank is carryout modern banking business in the country under commercial bank Act 1974. The state bank of India is holding 50.60 percent equity and 49.40 percent equity holding by Nepali promoter's general public investors and others. The bank authorized capital, issued capital and paid of capital is 1,000,000,000, 1000,000,000

and 874,528,000 respectively. There are 19 branch of SBI bank in Nepal and the total staffs are 325.

Following table 4.14 represents the market price per share and dividend per share of Nepal SBI bank for the purpose of risk and return analysis.

Table No 4.14

Market price per share and Dividend per share Data of Nepal SBI Bank

Financial Year	Market price per share	Dividend per share		
	Closing price (Rs.)	Cash (Rs.)	Stock (%)	Total (Rs.)
060/61	307	0	0	0
061/62	335	0	0	0
062/63	612	5	0	0
063/64	1176	12.59	35	514.44
064/65	1511	0	0	0
065/66	1900	2.11	40	298.51
066/67	741	5	15	33.25
067/68	565	5	12.5	86.25

Data Sources: NEPSE Index and AGM Report of Nepal SBI bank
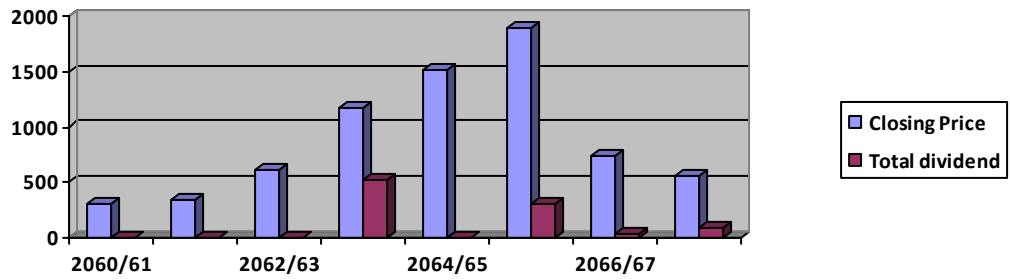
* 12.59 + 35% of 1511 = 541.44

** 2.11 + 40% of 741 = 298.51

 *5+ 5% 0f 565= 33.25

*15 +12.5 % of 570 = 86.25

Diagram 4.9

Market price of share and Dividend per share of SBI are shown below

Data source: Table No. 4.14

Market price per share is maximum is Fy 2065/66 and lowest in Fy 2060/61. Dividend per share is maximum in Fy 2063/64.

-Rate of Return, Expected Return, Standard Deviation, Coefficient of Variation and Trend Line of Rate of Returns of SBI Bank

Rate of return for each year are calculated for the basis of closing price of common stock and dividend amounts of respective year. Table 4.15 shows the calculation of year wise rate of return, expected rate of return, standard deviation and coefficient of variation or return.

Table No 4.15

Rate of Return, Expected rate of Return, S.D, CV, of the Common Stock of Nepal SBI bank

Fy	Closing price(P)	Div.(D)	$R = \dfrac{Dt + (Pt - Pt\text{-}1)}{Pt\text{-}1}$	[R – E(R)]	[R – E(R)]^2
2060/61	307	0	-	-	-
2061/62	335	0	0.0912	-0.3018	0.0911
2062/63	612	0	0.8269	0.4339	0.1883
2063/64	1176	514.44	1.8063	1.4133	1.9974
2064/65	1511	0	0.2849	-0.1081	0.0117
2065/66	1900	298.51	0.4550	0.062	0.0038
2066/67	741	33.25	-0.5925	-0.9855	0.9712
2067/68	565	86.25	-0.1211	-0.5141	0.2643
Total			2.7507		3.5278

Data Sources: Table No. 4.14

We have,

Expected Return E(R) = E(R) / n = 2.7507 / 7 = 0.3930

Standard Deviation ( ) = $\sqrt{E[R - E(R)]^2 / n - 1}$ = $\sqrt{3.5278/57 - 1}$

= 0.7668

Coefficient of variation (C.V) = / E(R) = 0.7668 / 0.3930 = 1.9511

Rate of return (Trend Value) for each year are calculated on the basis of rate of return on common stock of Nepal SBI bank respective year by using least square method as follows. Table 4.22 shows the calculation of year wise realized rate of return or trend value.

Table No. 4.16

Year wise Expected Rate of Returns Data of Nepal SBI Bank

Fy	Rate of Return(Y)	Deviation From Fy 064/65(X)	XY	X^2	Trend Value (Yc)
2061/62	0.0912	-3	-0.2736	9	0.9102
2062/63	0.8269	-2	-1.6538	4	0.7378
2063/64	1.8063	-1	-1.8063	1	0.5654
2064/65	0.2849	0	0	0	0.3930
2065/66	0.4550	1	0.4550	1	0.2206
2066/67	-0.5925	2	-1.185	4	0.0482
2067/68	-0.1211	3	-0.3633	9	-0.1242
Total	2.7507	0	-4.827	28	

Data Source: Table 4.15

We have,

The equation of trend is Yc = a + bX

As Σx = 0, a = EY/n = 2.7507/7 = 0.3930

b = ΣXY/ ΣX^2 = -4.827/28 = -0.1724

Here,

Trend line Yc = a + bX = 0.3930 + (-0.1724)X

When X= -3, Yc = 0.3930 + (-0.1724) (-3) = 0.9102

When X= -2, Yc = 0.3930 + (-0.1724) (-2) = 0.0.7378

When X= -1, Yc = 0.3930 + (-0.1724) (-1) = 0.5654
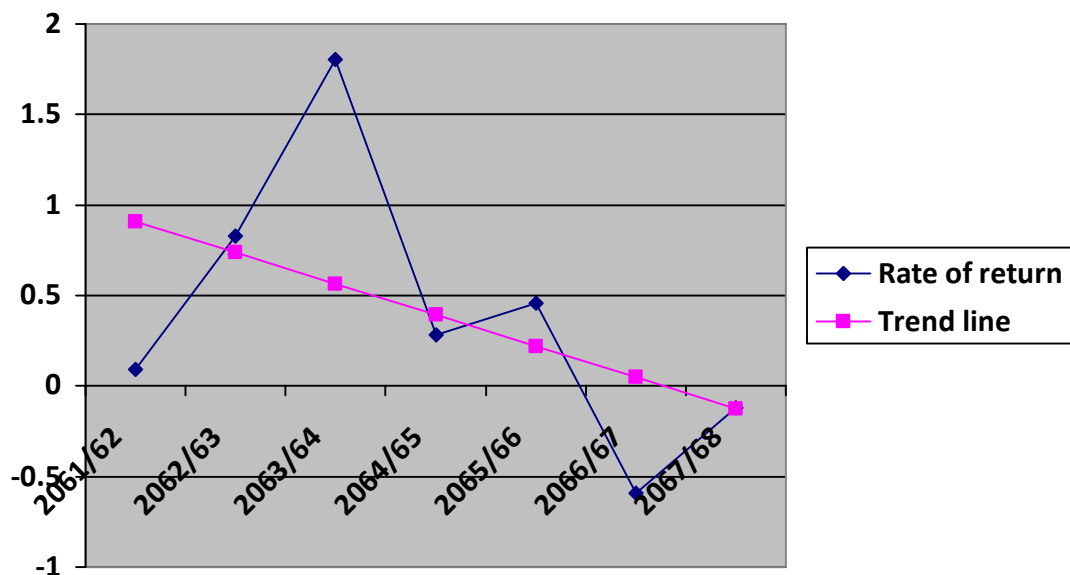
When X= 0, Yc = 0.3930 + (-0.1724) (0) = 0.3930

When X= 1, Yc = 0.3930 + (-0.1724) (1) = 0.2206

When X= 2, Yc = 0.3930 + (-0.1724) (2) = 0.0482

When X=3, Yc = 0.3930 + (-0.1724) (3) = 0.1242

Diagram 4.10

Movement of Stocks Rate if Return and Trend Line of Nepal SBI bank

Data Sources: Table No. 4.16

The diagram 4.10 shows the movement of common stock of Nepal SBI Bank realized rate of return R and trend line. Here, in the beginning Fy 2061/62 R is low but it moved up highly in Fy 2063/64. It started to move down very fast in the year 2064/65 and it goes upward in the year 2065/66 and then again decreased 2066/67 and tends towards up in 2067/68. The trend line down at the beginning year but after that it goes downward continuously.

4.2 Inter – Bank Comparision

4.2.1 On the Basis of Risk and Return Analysis

After analyzing the expected returns, Standard deviation of returns, coefficient of variation of each bank for the Fy 2061/62 to 2067/68, result are given in the following table 4.17.

Table No. 4.17

Expected Return, Standard Deviation and CV of Sample Banks

S.N	Sample Banks	Expected Return E(R)	Standard Deviation ( )	Coefficient of Variation (C.V)	Remarks		
					E(R)		C.V
1	SCBNL	0.3634	0.7408	2.039			
2	NIBL	0.2612	0.5872	2.2438			
3	BOKL	0.41	0.7137	1.7407	Highest		Lowest
4	HBL	0.2529	0.4471	1.7679		Lowest	
5	SBI	0.3930	0.7668	1.9511			

Data Source: Result from section 4.1

The table shows that investors can get the highest return from investment in common stock of BOKL and lowest return from investment in common stock of HBL.SBI has the highest and HBL has the lowest standard deviation. But coefficient of variation is best way of make investment decision is common stock when two or more investment have different return and different risk. The coefficient of variation measures the risk per unit. NIBL has highest and BOKL has lowest C.V. To earn one unit of return an investor has to bear 1.7407 unit of risk by investing in BOKL. To make comparison easily understandable diagram 4.11 is represented below.

Diagram No 4.11

Expected Return, Standard Deviation and C.V. of sample Bank
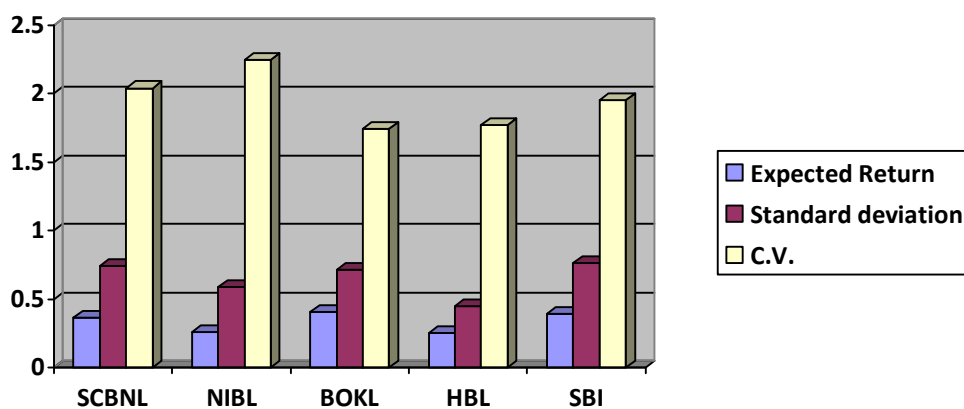
4.2.2 On the Basis of Market Capitalization

Market Capitalization of sample commercial bank at the end of Fy 2067/68 are presented below in table no. 4.18. Market capitalization is the total market value at specific time period of the company.

Table No. 4.18

Market Capitalization of selected Banks at 14th July 2011

S.N.	Sample Bank	Market Capitalization	Percentage
1	SCBNL	28948609800	40.69
2	NIBL	12396404835	17.42
4	BOKL	7749039990	10.89
5	HBL	11500000000	16.17
7	SBI	10548898040	14.83
	Total	71142952660	100

Data Sources: NEPSE Index.

Diagram 4.12

Market Capitalization of selected Banks
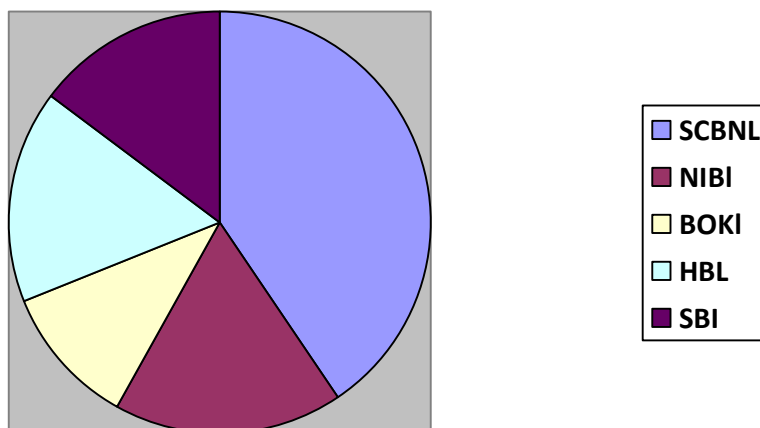
Data sources: Table No. 4.18

The comparison is made on the movement of market capitalization. Here only five commercial banks are taken into consideration as their data covers the entire study period. On the basis of market capitalization, SCBNL is the biggest (i.e 40.69%) and BOKL is lowest (i.e 10.89%) among the sample banks.

4.3 Analysis of Market Risk and Return

In Nepal there is only one stock market, namely Nepal Stock Exchange. Overall market movement is represented by NEPSE index. To calculate annual return, expected return on market, market standard deviation and coefficient of variation of overall market is presented below in table 4.19.

Table No. 4.19

Rate of Return, Expected Return, S.D. and C.V of market

Fy	NEPSE Index (NI)	$R_m = \dfrac{Ni_t - Ni_{t-1}}{NI_{t-1}}$	$[R_m - E(R_m)]$	$[R_m - E(R_m)]^2$
2060/61	222.04	-	-	-
2061/62	286.67	0.2911	0.01494	0.0223
2062/63	386.83	0.3494	0.2077	0.0431
2063/64	683.95	0.7681	0.6264	0.3924
2064/65	963.36	0.4085	0.2668	0.0712
2065/66	749.10	-0.2224	-0.3641	0.1326
2066/67	477.73	-0.3623	-0.504	0.2540
2067/68	362.85	-0.2405	-0.3822	0.1461
Total		0.9919		1.0617

Data Sources: NEPSE Index.

We have,

Expected Return $E(R_m) = E(R_m) / n = 0.9919 / 7 = 0.1417$

Standard Deviation $(\sigma_m) = \sqrt{E[R_m - E(R_m)]^2 / n - 1} = \sqrt{1.0617/7 - 1}$

$= 0.3895$

Coefficient of variation (C.V) $= \sigma_m / E(R_m) = 0.3895 / 0.1417 = 2.7488$

Rate of return (Trend Value) for each year are calculated on the basis of rate of return on common stock of NEPSE respective year by using least square method as follows. Table 4.20 shows the calculation of year wise realized rate of return or trend value.

Table No. 4.20

Year wise Expected Rate of Returns Data of Nepal SBI Bank

Fy	Rate of Return(Y)	Deviation From Fy 063/64(X)	XY	X^2	Trend Value (Yc)
2061/62	0.2911	-3	-0.8733	9	0.5713
2062/63	0.3494	-2	-0.6988	4	0.4281
2063/64	0.7681	-1	-0.7681	1	0.2849
2064/65	0.4085	0	0	0	0.1417
2065/66	-0.2224	1	-0.2224	1	-0.0015
2066/67	-0.3623	2	-0.7246	4	-0.1447
2067/68	-0.2405	3	-0.7215	9	-0.2879
Total	0.9919	0	-4.0087	28	

Data Source: Table 4.19

We have,

The equation of trend is $Yc = a + bX$

As $Ex = 0$, $a = EY/n = 0.9919/7 = 0.1417$

$b = EXY/ EX^2 = -4.0087/28 = -0.1432$

Here,

Trend line $Yc = a + bX = 0.1417 + (-0.1432)X$

When X= -3, $Yc = 0.1417 + (-0.1432) (-3) = 0.5713$

When X= -2, $Yc = 0.1417 + (-0.1432) (-2) = 0.4281$

When X= -1, $Yc = 0.1417 + (-0.1432) (-1) = 0.2859$
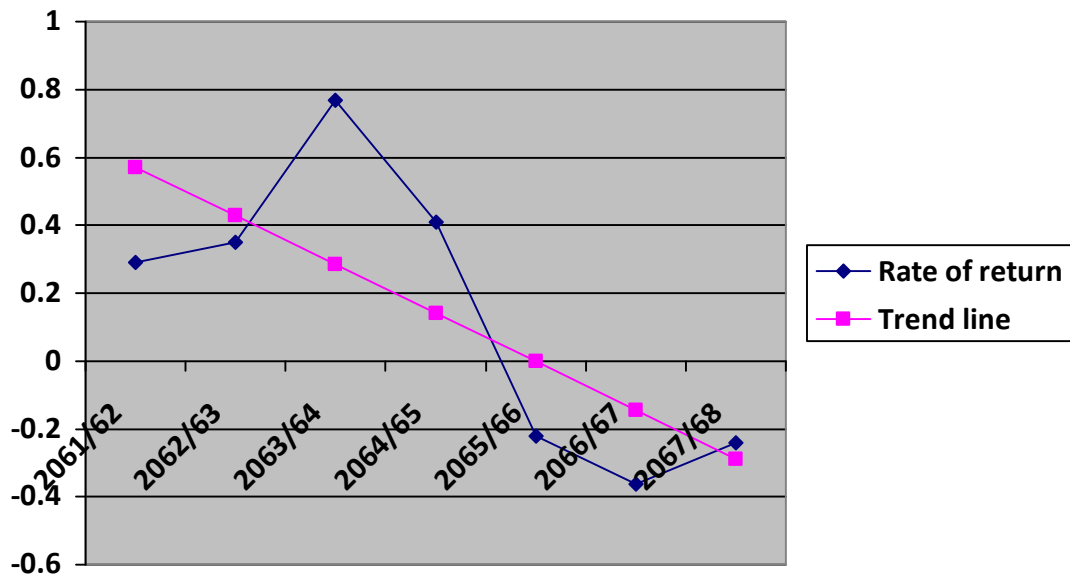
When X= 0, $Yc = 0.1417 + (-0.1432) (0) = 0.1417$

When X= 1, $Yc = 0.1417 + (-0.1432) (1) = -0.0015$

When X= 2, $Yc = 0.1417 + (-0.1432) (2) =- 0.1447$

When X= -3, $Yc = 0.1417 + (-0.1432) (-3) =- 0.2879$

Diagram 4.13

Movement of Market Rate of Return and Trend Line of Market Return

Data Source: Table No. 4.20

The diagram 4.13 shows the movement of rate of returns and trend line of market. In the year 2063/64 R is very high but it moved down and negative after that and the market is seen some recovery in 2067/68. Similarly the trend line in the beginning 2061/62 is high but it started to move downward very fast after that. This is due to the negative attitude of general investor towards investment in common stock and also capital market overall low performance.

4.4 Comparision OF Sample Banks With Market

4.4.1 Standard Charted Bank Nepal Limited

Table No. 4.21

Summary of Risk and Return for SCBNL and Market

Statistics	SCBNL	Market
Expected Return E(R)	0.3634	0.1417
Variance (σ^2)	0.5488	0.1517
Standard Deviation (σ)	0.7408	0.3895
Coefficient of Variation (C.V.)	2.039	2.7488
Systematic risk $\beta^2 \sigma_m^2$	0.4580	-
Unsystematic risk (e^2)	0.0908	-
Beta (β) = Index of Systematic risk	1.7376	1
Alpha (α) = Intercept	0.1172	-
Correlation with market (ρ)	0.9135	-
Proportion of systematic risk(ρ^2)	0.8345	-
Proportion of unsystematic risk (1 – ρ^2)	0.1655	-

Data sources: Table No. 4.3 and 4.19

SCBNL common stocks expected return is higher than the market return (36.34% > 14.17%). It means SCBNL stock return is 2.5645 times higher than the market return. This is due to the every year this bank paying high dividend. SCBNL Common stocks standard deviation is higher than the market standard deviation (i.e 0.7408 > 0.3895).

Coefficient of variation is better measure of risk because it measures per unit risk. C.V. of SCBNL is less than C.V. of market (i.e. 2.039 < 2.7488) which means common stocks SCBNL has less risk per unit return than the market return.

Beta coefficient of SCBNL is 1.7376 based on yearly returns during Fy 2061/62 to 2067/68. A beta of 1.7376 (β >1) means the SCBNL return is more volatile than the market return.

The intercept is 0.1172 it shows that the SCBNL return when market return is zero. Expected return of SCBNL is 11.72 percent when the market earns nothing. It is the yearly market return is expected to be 1 percent, expected yearly return of SCBNL is

$R = \alpha + \beta R_m$

$= 0.1172 + 1.7376 \times 0.1417 = 0.3634 = 36.34\%$

The correlation with market is 0.9135. The positive indicates that the market (NEPSE) return goes up; return of SCBNL also goes up or vice versa. The coefficient of determination or proportion of systematic risk is 0.8345. it indicates the percentage of the variance of SCBNL return explained by the change in the market return. So, it is called the systematic (Market) risk and therefore, it is un-diversifiable.

The 0.1655 (1-), residual variance is specific risk of this firm. It is called unsystematic risk and it is diversifiable. The value of systematic risk and unsystematic risk are shown above table no. 4.21.

4.4.2 Nepal Investment Bank Ltd (NIBL)

Table No. 4.22

Summary of Risk and Return for NIBL and Market

Statistics	NIBL	Market
Expected Return E(R)	0.2617	0.1417
Variance (σ^2)	0.3448	0.1517
Standard Deviation (σ)	0.5872	0.3895
Coefficient of Variation (C.V.)	2.2438	2.7488
Systematic risk $\beta^2 \sigma^2_m$	0.2290	-
Unsystematic risk (e^2)	0.1158	-
Beta (β) = Index of Systematic risk	1.2287	1
Alpha (α) = Intercept	0.0876	-
Correlation with market (ρ)	0.8150	-
Proportion of systematic risk(ρ^2)	0.6642	-
Proportion of unsystematic risk ($1 - \rho^2$)	0.3358	-

Data sources: Table No. 4.5 and 4.19

NIBL Common stocks expected return is high than the market return (26.17% > 14.17%), which means NIBL stock return is 1.8469 times higher than the market return. This is due to the every year this bank paying high dividend. NIBL Common stocks standard deviation is higher than the market standard deviation (i.e 0.5872 > 0.3895).

Coefficient of variation is batter measure of risk because it measures per unit risk. C.V. of NIBL is less than C.V. of market (i.e. 2.2438 <2.7488) which means common stocks NIBL has less risk per unit return than the market return.

Beta coefficient of NIBL is 1.2287 based on yearly returns during Fy 2061/62 to 2067/68. A beta of 1.2287 (β > 1) means the NIBL return is more volatile than the market return so it is called a aggressive asset.

The intercept is 0.0876 which shows that the NIBL return when market return is zero. Expected return of NIBL is 8.76 percent when the market

earns nothing. If the yearly market return is expected to be 1 percent, expected yearly return of NIBL is

$$R = \alpha + \beta R_m$$

$$= 0.0876 + 1.2287 \times 0.1417 = 0.2617 = 26.17\%$$

The correlation with market is 0.8150. The positive indicates that the market (NEPSE) return goes up; return of NIBL also goes up or vice versa. The coefficient of determination or proportion of systematic risk is 0.6642. It indicates the percentage of the variance of NIBL return explained by the change in the market return. So, it is called the systematic (Market) risk and therefore, it is un-diversifiable.

The 0.3358 (1- ρ^2), residual variance is specific risk of this firm. It is called unsystematic risk and it is diversifiable. The value of systematic risk and unsystematic risk are shown above table no. 4.22.

4.4.3 Bank of Kathmandu (BOK)

Table No 4.23

Summary of Risk and Return for BOK and Market.

Statistics	BOK	Market
Expected Return E(R)	0.41	0.1417
Variance (σ^2)	0.5094	0.1517
Standard Deviation (σ)	0.7137	0.3895
Coefficient of Variation (C.V.)	1.7407	2.7488
Systematic risk $\beta^2 \sigma^2_m$	0.3540	-
Unsystematic risk (e^2)	0.1554	-
Beta (β) = Index of Systematic risk	1.5274	1
Alpha (α) = Intercept	0.1936	-
Correlation with market (ρ)	0.8337	-
Proportion of systematic risk(ρ^2)	0.6950	-
Proportion of unsystematic risk (1 – ρ^2)	0.305	-

Data sources: Table No. 4.9 and 4.19

BOK Common stocks expected return is high than the market return (41.00% > 14.17%). This means BOK stock return is 2.8934 times higher

than the market return. This is due to the every year this bank paying high dividend. BOK Common stocks standard deviation is higher than the market standard deviation (i.e 0.7137 > 0.3895).

Coefficient of variation is better measure of risk because it measures per unit risk. C.V. of BOK is less than C.V. of market (i.e. 1.7407 < 2.7488) which means common stocks BOK has less risk per unit return than the market return.

Beta coefficient of BOK is 1.5274 based on yearly returns during Fy 2061/62 to 2067/68. A beta of 1.5274 (> 1) means the BOK return is more volatile than the market return so it is called a aggressive asset.

The intercept is 0.1936 which shows that the BOK returns when market return is zero. Expected return of BOK is 19.36 percent when the market earns nothing. If the yearly market return is expected to be 1 percent, expected yearly return of BOK is

$R = \alpha + \beta R_m$

$= 0.1936 + 1.5274 \times 0.1417 = 0.41 = 41\%$

The correlation with market is 0.8337. The positive indicates that the market (NEPSE) return goes up; return of BOK also goes up or vice versa. The coefficient of determination or proportion of systematic risk is 0.6950. It indicates the percentage of the variance of BOK return explained by the change in the market return. So, it is called the systematic (Market) risk and therefore, it is un-diversifiable.

The 0.305 (1- ρ^2), residual variance is specific risk of this firm. It is called unsystematic risk and it is diversifiable. The value of systematic risk and unsystematic risk are shown above table no. 4.23.

4.4.4 Himalayan Bank Ltd (HBL)

Table No 4.24

Summary of Risk and Return for HBL and Market.

Statistics	HBL	Market
Expected Return E(R)	0.2529	0.1417
Variance (σ^2)	0.1999	0.1517
Standard Deviation (σ)	0.4471	0.3895
Coefficient of Variation (C.V.)	1.7679	2.7488
Systematic risk $\beta^2\sigma^2_m$	0.2010	-
Unsystematic risk (e^2)	-0.0011	-
Beta (β) = Index of Systematic risk	1.1510	1
Alpha (α) = Intercept	0.1631	-
Correlation with market (ρ)	1	-
Proportion of systematic risk(ρ^2)	1.0056	-
Proportion of unsystematic risk (1 – ρ^2)	-0.0056	-

Data sources: Table No. 4.12 and 4.19

HBL Common stocks expected return is high than the market return (25.29% > 14.17%). This means HBL stock return is 1.7848 times higher than the market return. This is due to the every year this bank paying high dividend. HBL Common stocks standard deviation is higher than the market standard deviation (i.e 0.4417 > 0.3895).

Coefficient of variation is better measure of risk because it measures per unit risk. C.V. of HBL is less than C.V. of market (i.e. 1.7679 < 2.7488) which means common stocks HBL has less risk per unit return than the market return.

Beta coefficient of HBL is 1.1510 based on yearly returns during Fy 2061/62 to 2067/68. A beta of 1.1510 (β > 1) means the HBL return is more volatile than the market return so it is called a aggressive asset.

The intercept is 0.1613 which shows that the HBL returns when market return is zero. Expected return of HBL is 16.31 percent when the market

earns nothing. If the yearly market return is expected to be 1 percent, expected yearly return of HBL is

$$R = \alpha + \beta R_m$$

$$= 0.1631 + 1.1510 \times 0.1417 = 0.3262 = 32.62\%$$

The correlation with market is 1.It indicates that the market (NEPSE) return and return of HBL goes up equally or vice versa. The coefficient of determination or proportion of systematic risk is 1.0056. It indicates the percentage of the variance of HBL return explained by the change in the market return. So, it is called the systematic (Market) risk and therefore, it is un-diversifiable.

The -0.0056 (1- ρ^2), residual variance is specific risk of this firm. It is called unsystematic risk and it is diversifiable. The value of systematic risk and unsystematic risk are shown above table no. 4.24.

4.4.5 Nepal SBI Bank Ltd (SBI)

Table No 4.25

Summary of Risk and Return for Nepal SBI and Market.

Statistics	SBI	Market
Expected Return E(R)	0.3930	0.1417
Variance (σ^2)	0.5880	0.1517
Standard Deviation (σ)	0.7668	0.3895
Coefficient of Variation (C.V.)	1.9511	2.7488
Systematic risk $\beta^2 \sigma^2_m$	0.4525	-
Unsystematic risk (e^2)	0.1355	-
Beta (β) = Index of Systematic risk	1.7271	1
Alpha (α) = Intercept	0.1483	-
Correlation with market (ρ)	0.8773	-
Proportion of systematic risk(ρ^2)	0.7696	-
Proportion of unsystematic risk (1 – ρ^2)	0.2304	-

Data sources: Table No. 4.15 and 4.19

Nepal SBI Common stocks expected return is high than the market return (39.30% > 14.17%). This means Nepal SBI stick return is 2.7735 times

higher than the market return. This is due to the every year this bank paying high dividend. Nepal SBI Common stocks standard deviation is higher than the market standard deviation (i.e $0.7608 > 0.3895$).

Coefficient of variation is better measure of risk because it measures per unit risk. C.V. of Nepal SBI is less than C.V. of market (i.e. $1.9511 < 2.7488$) which means common stocks Nepal SBI has less risk per unit return than the market return.

Beta coefficient of Nepal SBI is 1.7271 based on yearly returns during Fy 2061/62 to 2067/68. A beta of 1.7271 (> 1) means the Nepal SBI return is high volatile than the market return. It is an aggressive asset.

The intercept is 0.1483 which shows that the Nepal SBI returns when market return is zero. Expected return of Nepal SBI is 14.83 percent when the market earns nothing. If the the yearly market return is expected to be 1 percent, expected yearly return of SBI is

$R = \ \ + \ \ R_m$

$\ \ = 0.1483 + 1.7271 \times 0.1417 = 0.3930 = 39.30\%$

The correlation with market is 0.8733. The positive indicates that the market (NEPSE) return goes up; return of SBI also goes up or vice versa. The coefficient of determination or proportion of systematic risk is 0.7696. It indicates the percentage of the variance of Nepal SBI return explained by the change in the market return. So, it is called the systematic (Market) risk and therefore, it is un-diversifiable.

The 0.2304 (1- ^{2}), residual variance is specific risk of this firm. It is called unsystematic risk and it is diversifiable. The value of systematic risk and unsystematic risk are shown above table no. 4.25.

Table No. 4.26

Summary of Risk and Return for sample Banks.

Statistics	SCBNL	NIBL	BOK	HBL	SBI	Remark
E(R)	0.3634	0.2617	0.41	0.2529	0.3930	
(σ^2)	0.5488	0.3448	0.5094	0.1999	0.5880	
(σ)	0.7408	0.5872	0.7137	0.4471	0.7668	
(C.V.)	2.039	2.2438	1.7407	1.7679	1.9511	
$\beta^2\sigma^2_m$	0.4580	0.2290	0.3540	0.2010	0.4525	
(e^2)	0.0908	0.1158	0.1554	0	0.1355	
(β)	1.7376	1.2287	1.5274	1.1510	1.7271	
(α)	0.1172	0.0876	0.1936	0.1631	0.1483	
(ρ)	0.9135	0.8150	0.8337	1	0.8773	
(ρ^2)	0.8345	0.6642	0.6950	1	0.7696	
$(1 - \rho^2)$	0.1655	0.3358	0.305	0	0.2304	

Data source: Table 4.17 and Appendix I to V

4.5 Price Evaluation of Selected Banks

CAPM is model that assumes stock's required rate of return is equal to the risk free rate plus its risk premium where risk is measured by the beta coefficient. Beta coefficient play vital role in CAPM approach. If the required rate of return is less than expected rate of return, the stock is said to be under priced and required rate of return is more than expected rate of return, the stock is said to be over priced. For this analysis the risk free rate of return is needed, which is taken from the interest rate of Treasury bill issued by Nepal Rastra Bank. NRB issued treasury bill91 days and 365 days time duration. Table 4.27 shows the required rate of return, expected return and price evaluation. 91 days duration Treasury bill rate is taken as a risk free rate from web site [www.nrb.org.np] of NRB. This is approximately 8.3699 percent in date June 21, 2011.

Table No. 4.27

Calculation of Required Rate of Returns and Price Evaluation by CAPM Model.

Banks	Beta	$E(R_i) = R_f + [E(R_m) - R_f] \ _i$	E(R)	Price Situation
SCBNL	1.7376	0.1845	0.3634	Under price
NIBL	1.2287	0.1550	0.2617	Under Price
BOKL	1.5274	0.1723	0.41	Under Price
HBL	1.1510	0.1505	0.2529	Under Price
SBI	1.7271	0.1839	0.3930	Under Price

Where,

E(R) = Expected rate of return (from table 4.26)

R_f = Risk free rate of return (0.0837)

$E(R_m)$ = Market rate of return (0.1417)

= Beta of individual sample Banks (From table no. 4.26)

All the stocks of commercial bank are under price ,so the investor can gain from buying the stock for the five sample bank. The five sample bank value will be increased in the near future providing the investors higher return. So investor should buy this stock and who are holding they shouldn't sell.

4.6 Portfolio and Risk Diversification Analysis

Portfolio is a combination of more than two types of assert for the investment. In this study the portfolio analysis has done to find out, that portfolio return is more than individual security's return. It is a group of assets compiled to minimize the risk on investment. To invest in single security is risky but to be relatively safe if hold in a portfolio. The major objective of portfolio analysis is to suggest the assets for investment that stabilized the earnings and minimize the risk. It helps to minimize the chance of loss from the change in stock price.

The risk diversification is based on two asset portfolio and tools for analysis are persecuted in research methodology chapter. Here, the portfolio of the common stock of SCBNL and NIBL is analyzed. Table 4.28 shows the calculation of covariance of returns given two stocks cov (R_{SCBNL}, R_{NIBL}) and the proportion of SCBNL's stock [W_{SCBNL}] that minimizes the risk.

Let,

Stock of SCBNL is X

Stock of NIBL is Y

Table No. 4.28

Covariance and W_x of stock X and W_y of stock Y

FY	RX-E(Rx)	Ry=E(Ry)	[Rx-E(Rx)] [Ry-E(Ry)]
2061/62	0.0492	0.7522	0.037
2062/63	0.5534	0.4575	0.2532
2063/64	1.1253	0.0954	0.1074
2064/65	0.3171	0.4246	0.1346
2065/66	0.3016	-0.687	-0.2072
2066/67	-0.9264	-0.7323	0.6784
2067/68	-0.8175	-0.3103	0.2536
Total			1.257

Data source: table 4.26 and Appendix I &II

We have

Cov(R_x,R_y) = E(R_x-E(R_x)] [R_y-E(R_y)]/n-1 = 1.257/7-1 = 0.2095

Now with the help of cov (R_x, R_y), we can calculate optimal weight of stock x and y which minimize the risk.

W_X = $_y{}^2$ – cov (Rx, Ry)/ $_x{}^2$+ $_y{}^2$-2cov (Rx, Ry)

Wx=proportion (weight) of stock x (SCBNL)

94

X = S.D. of stock x (SCBNL) = 0.7408

y = S.D. of stock y (NIBL) = 0.5872

$W_X = (0.587)^2 - 0.2095/ (0.7408)^2 + (0.5872)^2 - 2.x0.2095 = 0.1351/0.4746$

$$= 0.2847$$

And the proportion of stock y (Wy)

$$Wy = 1-Wx$$

$$=1- 0.2847 = 0.7153$$

Since the optimal weight of stock x (SCBNL) is 0.2847 and stock of y (NIBL) is 0.7153 when holding portfolio of SCBNL and NIBL.

Now we can calculate portfolio return and risk of SCBNL and NIBL.

Portfolio return is the sum of returns on individual securities multiplies by their respective weight.

$E(R_p) = Wx\ E(Rx) + Wy\ E(Ry)$

$$= 0.2847\ x0.3634 + 0.7153\ x0.2617 = 0.2907 = 29.07\%$$

Portfolio Risk is given as

$_p = \quad _x^2 w_x^2 + \quad _y^2 w_y^2 + 2w_x\ w_y\ Cov(R_x\ R_y)$

$= (0.7408)^2\ (0.2847)^2 + (0.5872)^2\ (0.7153)^2 + 2\ (0.2847)\ (0.7153)\ (0.2095)$

$$= 0.5534$$

Using the diversification, we can reduce the risk. Standard deviation of SCBNL and NIBL was 0.7408 and 0.5872 respectively before the diversification. But after portfolio construction, which is lower than the risk is 0.5534.

4.7 Correlation Between Banks

The correlation coefficient always lies between +1 and -1. Returns of securities are very perfectly together when the correlation coefficient is +1 and in perfectly opposite direction when it is -1. A zero correlation coefficient implies that there is no relationship between the returns of

securities. Correlation between the returns of the two securities plays a significant role in risk reduction by portfolio construction. The table no 4.29 presented below shows the various consolations between each sample banks.

Table No. 4.29

Correlation Matrix

Sample	SCBNL	NIBL	BOK	HBL	SBI
SCBNL	1	0.4816	0.7104	0.8415	0.9193
NIBL		1	0.7564	0.6014	0.3327
BOKL			1	0.5926	0.5624
HBL				1	0.8987
SBI					1

Above table no 4.29 shows correlation between sample bank's stocks. There are positive correlation between various banks. If correlation between stocks is +1, any part of risk can not be reduced by diversification. On the other hand, if correlation between stocks is -1, the proper combination of two stocks can reduces all the risk. So in conclusion it can be said that as long as correlation between securities return is negative, construction of portfolio is benefitable.

4.8 Regression Analysis

Analysis of regression is designed to ascertain if there is some kind of relationship between the average return and variance fundamental variables of the banks. In this context, we are using only linear relationship. For the analysis, average a expected return of sample banks are taken as dependent variable and beta coefficient and correlation coefficient with market are chosen as independent variables. The input data and details of regression calculation are presented in appendix.

4.8.1 Regression Analysis

Simple regression model is applied as expected return E(R) is dependent and beta coefficient ( ) is independent variable. The model is

$Y = a + bX$

Where,

Y = Expected return, E(R)

a = Intercept (Constant)

X = Beta Coefficient ( )

The result of simple regression is presented in the table no 4.38

Table No. 4.30

Regression of Expected Return on Beta Coefficient.

The Regression Equation E(R) = a + b

Dependent Variable	Intercept a	Regression Coefficient of Beta B	R^2	Calculated-F	Tabulated-F
E(R)	-0.0101	0.2349	0.7615	9.7647	10.1

Data Source: Appendix X

The result presented in above table shows that the regression results, which is negative relation between E(R) and Beta ( ). One rupee increase in beta leads to rupee 0.2349 increase in E(R) with other variable constant. The coefficient of determination R^2 is 0.7615 which indicates that 76.15 percent of total variation in expected return can be explained by beta. Calculated 'F' value is 9.7647 which is less than the critical value of 'F' in 5% level of significant. Which means the regression equation of Y on X is not significant. So, it can be concluded that the model can't best explain the variation in expected return.

4.8.2 Multiple Regression Analysis

It is necessary to know the effect on expected return of commercial banks. For overall result, this study covered the data Fy 2061/62 to 2067/68 of sample banks. The equation examined the relationship between expected return with beta coefficient and correlation with market. For this purpose following regression model is applied as:

Y = a + b1 X1 + b2 X2

Where,

Y = Expected return, E(R)

a = Intercept (Constant)

X1 = Beta coefficient ( )

X2 = Correlation with market ( )

The result of the multiple regressions is presented in the table no 4.31

Table No. 4.31

Regression of Expected returns on Beta and Correlation coefficient.

The Regression Equation E(R) = a + b1   + b2

Dependent Variable	Intercept a	Regression Coefficient		R^2	Calculated -F	Tabulated -F
		b1	b2			
E(R)	0.3872	0.0062	-0.0677	0.0045	0.0046	19.0

Data Source: Appendix XV

The above results present the multiple linear relationship between E(R), Beta ( ) and correlation coefficient ( ) with market. One percent increase in beta 0.0062 percent increase in E(R), holding other variables constant. Expected return and coefficient of market shows the negative relation which falls the expected return. The value of multiple coefficient determination (R^2) is 0.0045 which indicates that 0.45 percent of total variation in average return can be explained by independent variables.

F- Statistics shows the regression equation is not significance result due to the higher critical (Tabulated) value at 5% level of significant. So, the regression model can not explain the variation.

4.9   Findings

It is very important part of the study. All people, investors, bankers, researcher and other who are related to investment on common stock may gain advantage from the findings of this study. From the analysis of this study, the major findings on risk and return analysis of common stock investment in Nepalese Commercial Banks are given below:

1. Expected return on the common stock of BOKL is the highest (i.e 41.00%) among five sample Banks.

2. Expected return on the common stock of HBL is the lowest (i.e 25.29%) among five sample banks.

3. On the basis of S.D, Common Stock of SBI is most risky since it has highest S.D (i.e. 0.7668) and common stock of HBL   least risky because it has lowest S.D (i.e 0.4471).

4. Coefficient of variation (C.V) is more rational basis of investment decision, which measures the risk per unit of return. On the basis of C.V. common stock of BOKL has lowest C.V among five sample bank. BOKL has 1.7407 unit of risk per one unit of return. And common stock of NIBL can be considered as more risk because it has the highest C.V. (i.e 2.2438) among the selected sample banks.

5. Beta coefficient measures the systematic risk and explains the sensitivity or volatility of stock with market. In this context, common stock of SCBNL is the most volatile (i.e   =1.7376) and common stock of HBL is least volatile (i.e 1.1510).

6. All the common stocks of sample commercial banks are aggressive because they have more than beta coefficient of market (>1).

7. Alpha is the Intercept; where the characteristic line intercepts the vertical arise. Alpha is an estimate of the asset's rate of return when market return is zero. Bank of Kathmandu has 19.6 percent alpha which is the highest alpha among sample banks. Similarly another sample banks have also positive alpha value. On the basis of alpha analysis common stock of BOK is the best and common stock of NBBL has lowest (i.e 8.76%) alpha value among the sample banks.

8. The correlation coefficient is lies between +1 and -1. All the sample banks have positive correlation with market. The positive correlation indicates that with market return goes up; return on common stock of sample banks also goes up or vice versa. Correlation coefficient of HBL is the highest (i.e 1) while correlation coefficient of NIB is lowest among the sample banks (i.e 0.8150).

9. Correlation between stock of SCBNL and SBI is the highest positive (i.e 0.9193) nearly +1 and stock of NIBL and Nepal SBI have lowest correlation(i.e 0.3327). Other banks are also highly positive correlated.

10. Common stock of HBL has highest coefficient of determination or proportion of systematic (i.e 100.56%) risk, which can not be minimized through diversification. Whereas common stock of NIB has the lowest proportion of systematic risk (i.e 66.42%).

11. Lower the coefficient of determination means higher the proportion of unsystematic risk. That means common stock of NIB has highly diversifiable risk (i.e 33.58%) while common stock of HBL has no diversifiable risk (i.e -00.58%). Unsystematic risk can be avoided through diversification. From above analysis investors are recommended to purchase that stock, which was high expected

return with low proportion of un-diversifiable risk to make portfolio investment.

12. SCBNL is in the highest position (i.e Rs. 28,948,609,800) and BOKL is in the lowest position (i.e 7,749,039,990) capitalization comparison. The inter-industry comparison has placed the banking industry in the top position and the others industry in the bottom position.

13. Unsystematic risk can be reduced by making a portfolio of individual security significantly. If investor select the securities for investment, which have highly negative correlation returns, the risk can be reduced totally. If the correlation between the return of two stocks is highly positive, risk reduced is not so significant. In this research no banks have negative correlation between their returns, which is favorable with the view point of the diversification. All banks have positive correlation among their returns.

14. Calculation for the trend value least square method is used and draw the trend line, all of the common stock of the sample bank's trend line, when graphically presented shown the downward movement.

15. Capital Assets Pricing Model describes that the relationship between risk and return. We can identify the stock is over priced or under priced by comparison between expected rate of return and required rate of return. If required rate of return is lower than expected rate of return stock is known as under priced and if the required rate of texture is greater than the expected rate of return, the stock is overpriced. This study shows that all the stock of commercial bank are under priced.

16. Regression results suggest that beta coefficient trend to have negative effect upon expected return. It means when the beta

increases, the risk ness of the firm will decrees and vice versa. So, additional increase in beta will not be rewarded by extra return.

17. F-Statistics in multiple regression analysis shows the insignificant result at 5% level of significance. So, the model cannot best explain the variation. This implies to the investors that the independent variables unable to best explain the dependent variable and there should be increases the independent variables so as to better explanation of dependent variable. The simple regression analysis shows also the insignificant result at 5% level of significance. So it can't explain the variations.

Chapter V
SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

Generally, investors invest their current cash only to those areas where these are high return and low risk. And investor looking for the common stock investment usually pays the price for stock based on this estimation about future dividends and grown in stock price. Besides commercial bank, development banks are investing their performance in Nepalese banking sector.

Lack of information and lean knowledge is chief problem faced by individual investor who are manipulated and exploited by the financial institution and their market intermediaries. The attitude and perception of investors play chief role in investment decision which is influenced by the information and access to the data required for analysis. Investor invests their wealth on the basis of guess and hunches because they do not have any information about the financial assets and they also lack the idea to reach to ideal investment decision. Investor purchase stocks merely looking past trend of stock prices and sometimes they have to bear heavy loss due to inadequate knowledge and information related to the stock investment. One expects favorable returns by holding stock. How can be made higher return assuming lower risk?

The main objective of the study is to analyze the risk and return of common stocks in Nepalese context. The study is focused on the common stock of listed commercial banks. Thus, listed seven commercial banks are taken as sample to analyze the risk and return on common stock

investment. While analyzing the risk and return, brief review of related studies has been performed. This analysis of risk and return is a significant in investment decision as well as managerial decision. It influences risk and return of the shareholders. Consequently, the risk and return analysis influences the market price of stock. So, before making and investment decision, a person must analyze the risk and return from particular stock as well be as they can make a good risk minimizing portfolio between their investments in the stock.

However, different scholars have various statistical as well as financial tools like required rate of return, expected rate of return, standard deviation, variance, coefficient of variation, beta coefficient, correlation coefficient, coefficient of determination, portfolio risk and portfolio return, least square regression equation and so on. Different diagrams, tables, graphs are used to present the result. All the data are collected from the secondary sources. Secondary sources of data are NEPSE, AGM report of various banks, trading report of SEBON, web site of NRB etc.

5.2   Conclusions

The shares of commercial banks in Nepal are heavily traded in the stock market. These shares play a key role in the determination of stock exchange indicators. The average mean return on market portfolio, as measured by percent changes in the NEPSE index, was 14.17 % over the sample period. All the shares produced higher rates of return than the return on market portfolio. However, the risk return characteristics do not seem to be the same for all the shares reviewed. The shares with highest standard deviation seem to be able to produce higher rate of return except BOK. The trends of returns on commercial banks in Nepal is declining till Fy2067/68 .The risk per unit of return, as measured by coefficient of variation, is less than that of market as a whole for all the individual

shares. The portion of unsystematic risk is higher as the value of beta coefficient is lesser except HBL. The portion of unsystematic risk of HBL is zero which indicates that it has hundred percent systematic risk that cannot be diversified. Almost all the shares fall under the category of aggressive stocks having beta coefficient greater than 1. All the stocks are moderately positive correlated with the market so that they have more beta coefficient than market. All common stocks are more volatile than the market. From the analysis, it appears that all of the common stocks are underpriced. Their market value will increase in the future. Since all the stocks are positively correlated with each other, they can be invested by making portfolio to reduce risk to some extent as risk cannot be diversified wholly.

5.3 Recommendations

Common stock is most risk security among all the marketable securities. Therefore, the investor must have proper knowledge and information to make the investment decision. Before making an investment decision in stock market, the investors should analyze the market situation carefully by analyzing his/he own risk return attitude, needs and requirements. One should make several discussions with stockbroker and make one's decision on the basis of reliable information rather than rumor and imagination. Investor can join to investors groups and share experience, ideas and expertise to each other.

Proper analysis of individual stock industry and overall market is always demanded to make possible to beat the stock market. General knowledge is about economic, political technological trend is advantageous. This is proved by the present political situation of Nepal, which caused a great deterioration in the share price.

This study is focused on individual investors and other related components of stock market are also taken into account to sources extent. On the basis of data analysis and major findings of this study following recommendation can be outlined.

1. Since the return of BOKL for given sample period is the highest, investors could be more benefited if they invest in the common stock of BOKL. By the same time, the risk is also not more than comparatively other sample banks.

2. From the correlation matrix (table no 4.29), the correlation coefficient of shares of all bank is positive, portfolio formation helps to reduce risk only to some extent not totally.

3. All common stock's beta is greater than one (>1), so they are more volatile than the market and these stocks are called aggressive stock. The risk seeker investors can use these stocks to have high return on high risk except BOKL.

4. The proportion of unsystematic or diversifiable risk on common stock of the NIB is 0.3358. Investors are suggesting investing into stock of NIB to minimize the risk of portfolio and maintain optimal portfolio. Since, the correlation coefficient both market and stock of NIB is least, it could help to construct the optimal portfolio.

5. Under CAPM approach, stocks are underpriced by which investors can grab the opportunity. New investors are suggested to purchase and who are holding the stock of five sample commercial banks are advised not to sell the stocks.

6. If investor is risk avertor, then s/he cannot choose any stock being all aggressive and if the investor is risk seeker, s/he can choose stock of SBI.

7. Risk and return analysis is completely untouched area in Nepalese context. It is strongly suggested that further study should be

conducted on this topic and research should include maximum number of sample and long period data will be use for research.

8. It is recommended to use latest risk and return analysis tools and techniques.

9. The investors are made aware about the stock market by various programs, trainings, seminars etc.

10. The share market must be developed by modern technology and be made easily accessible by investors.

11. Government needs to amend the rules and regulation regarding stock market in time to time and to make the policy that protects the individual investor's right. And also need to follow up the implementation of rules and regulation and to make sure the objectives are achieved. On the regard, Nepal Government needs to monitor and to make active all the components of stock market properly. The government has to implement the rules and regulation strictly other wise it will be meaning less. The political problem of the country is another burning issue, which affects the economy of the nation adversely. So political leaders should think seriously on economic motive of country rather than their self motive.

12. The corporate firm should disclose their actual financial condition so that insisted investors may analysis their performance and they only make a decision whether to invest on their stock or not. Value of assets and liabilities should not be manipulated to report the under or over profitability. Every decision of the corporation should be made to maximize the value of the firm and value per share.

REFERENCES

Books

Bhalla, V. K. (2000). *Investment management*. NewDelhi: S. Chand & Company.

Bradly, R., and Myers, S. (2002). *Principles of Corporate Finance.* New Delhi: Tata McGraw Hill.

Brigham, E. F., and Louis C. G. (1999). *Financial Management theory and Practice.* New Delhi: Hascourt Asia Pvt. Ltd.

Chandra, P. (1995). *The Investment Game.* New Delhi: Tata McGraw Hill.

Cheney, J. M., & Eduard, A. M. (1997). *Fundamentals of Investment.* New Yok: West Publishing Company.

Cheney, J.M. (1996). *Fundamental of Investment.* New York: West Publishing Company.

Fisher, D.E., and Jordan, R.J. (2000). *Security Analysis and Portfolio Management.* New Delhi: Prentic Hall Pvt.

Francis, J.C. (2000). *Investment Analysis and Management.* New York: McGraw Hall.

Francis, J.C. and Taylor, R.W. (1992). *Investment.* Singapore: McGraw Hill.

Gupta, S.C. (1990). *Fundamental of statistics.* Bombay: Himalayan Publishing house.

Gitman, L.J. (2001). *Principles of management finances.* New Delhi: Harper Collins Publishers.

Hamption, J. (2008). *Financial Decision Making.* New Delhi: Printed Hall of India Pvt. Ltd.

Pandey, I.M. (1999). *Financial Management Theory and Practice.* New Delhi: Vikash Publishing House.

Pradhan, R. S. (2008). *Capital Structure Management.* Kathmandu: Benchmark Education Support Pvt.Ltd.

Sharan, V. (2009). *Financial Management.* New Delhi: Dorling Kinderesley(India) Pvt. Ltd.

Sharpe, W. F., Alexender G. J. and Jeffery V. B. (2003). *Investment Analysis.* USA: Prentic Hall Inc.

Shrestha, M. K. (2037 B.S), *Financial Management.* Kathmandu: Curriculum Development Center, T.U.

Shrestha, M. K. (1992). *Shareholders Democracy and Annual General Meeting Feedback.* Kathmandu: portfolio Analysis Nepal Publication.

Thapa, K. (2006), *Investment.* Kathmandu: Asmita Books Publishers.

Van Horne, J.C. and Wachowicz, J. M. (1995). *Fundamentals of Financial Management.*USA: Prentic Hall Inc.

Van Horn, J.C. (2000). *Financial Management and Policy.* New Delhi: Prentice Hall of India.

Weston, J.F. and Copland T.F. (1992). *Management Finance.* New York: The Dryden Press.

Weston, J.F. and Brigham, E.F. (1991). *Management Finance. Chicago USA:* The Dryden Press.

Weston, J.F. (1996), *Essential of Management Finance.* New York: The Dryden Press.

Wolff, K. H. and Pant, P. R. (2002). *Social Science Research and Thesis Writing*. Kathmandu: Buddha Academic Enterprises Pvt. Ltd.

Articles

Bodurtha, J. N. and Mark, N. C. (1991). Testing the CAPM With Time Varying Risk and Return. *The Journal of Finance*, Vol. 46, No. 4, PP. 1485-1505.

Carl Ackerman, R. M. David (1999). The Performance of Hedge Funds: Risk Return and Incentive. *The Journal of Finance*, Vol. 54, No. 3, PP. 833-873.

Chaudary, B.R.(2009). Market Analysis. *The Journal of Business Age*, Vol. 9, No.3, P.61.

Ojha, Khagendra Prasad(2000). Financial performance and common stock pricing,---------------------.

Pokhrel, M. B. and Bhurtel P.(2009). Market Outlook. *The Journal of Business Age*, Vol. 8, No.7, P. 61.

Pradhan, R.S and Balampaki, S.B.(2003). Fundamental of Return*, SEBO Journal*, Vol. I., P. 8-22.

Thesis

Maharjan, U. (2005). *Risk and Return Analysis of Commercial Bank In Nepal.* An Unpublished MBS Thesis. Kathmandu: Central Department of Management, T.U.

Pandey, LilaNath. (2000). *Risk and Return Analysis in Common Stock Investment.* An Unpublished MBS Thesis. Kathmandu: Central Department of Management, T.U.

Rajbhandari, Merina (2005). *Risk and Return Analysis in Common Stock Investment of Nepalese Commercial Banks.* An Unpublished MBS Thesis. Kathmandu: Central Department of Management, T.U.

Sharma, Usha. (2009). *Risk and Return in common stock investment of commercial banks in Nepal.* An unpublished MBS Thesis. Kathmandu: Shankar Dev Campus.

Tamang, Buddhi Raj(2003). *Risk and Return Analysis in Common Stock Investment.* An Unpublished MBS thesis. Kathmandu: Nepal Commerce Campus, T.U.

Wagle, Laxmi Prasad. (2010). *Analysis of Risk and Return on common stock investment of commercial banks in Nepal*.An unpublished MBS Thesis. Makwanpur: Makwanpur Multiple Campus.

AGM Report

Standard Chartered Bank Nepal Ltd. (2067/068). *Annual Report.* Kathmandu, SCBNL.

Nepal Investment Bank Ltd. (2067/068).*Annual Report.* Kathmandu, NIBL.

Bank of Kathmandu Ltd. (2067/068). *Annual Report.* Kathmandu, BOK.

Himalayan Bank Ltd. (2067/068). *Annual Report.* Kathmandu, HBL.

Kumari Bank Ltd (2067/068). *Annual Report.* Kathmandu, KBL.

Nepal SBI Bank Ltd. (2067/068). *Annual Report.* Kathmandu, SBI.

Nepal Stock Exchange Index (2061/062 to 2067/068). *Trading Report.* Kathmandu, NEPSE Index.

Appendices

Appendix – I

Calculation of beta (β) coefficient and other variables of SCBNL

Fy	[R – E(R)]	[Rm – E(Rm)]	[R – E(R)] [Rm – E(Rm)]
2061/62	0.0492	0.1494	0.0074
2062/63	0.5534	0.2077	0.1150
2063/64	1.1253	0.6264	0.7049
2064/65	0.3171	0.2668	-0.0846
2065/66	0.3016	-0.3641	-0.1098
2066/67	-0.9264	-0.504	0.4670
2067/68	-0.8173	-0.3822	0.3124
			1.5815

Data Source; Table No. 4.3 and 4.25

Cov(R,Rm) = $\sum$ [R – E(R)] [Rm – E(Rm)] / n – 1 = 1.5815 /7 – 1 = 0.2636

Beta Coefficient of SCBNL (β) = Cov(R,Rm) / σ_m^2 = 0.2636/0.1517 = 1.7376

Calculation of alpha (α) intercept

WE have,

Expected return of SCBNL (R) = 0.3634

Expected Return of Market E(Rm) = 0.1417

Now,

α = E(R) – β E(Rm)

α = 0.3634 – 1.7376 x 0.1417 = 0.1172

Calculation of systematic risk and unsystematic risk

We have,

Variance or Total risk of SCBNL (σ^2) = 0.5488

Variance of market (σ_m^2) = 0.1517

112

Total risk = Systematic risk + Unsystematic risk

$$\sigma^2 = \beta^2 \, \sigma m^2 + \sigma e^2$$

Systematic risk $(\beta^2 \, \sigma m^2) = (1.7376)^2 \times 0.1517 = 0.4580$

Unsystematic risk (σe^2) = Total risk – Systematic risk

= 0.5488 – 0.4580 = 0.0908

Coefficient of determination or proportion of systematic risk (ρ^2) and proportion of unsystematic risk $(1 - \rho^2)$.

We have,

Proportion of systematic risk (ρ^2) = systematic risk / Total risk

$$= 0.4580 / 0.5488 = 0.8345$$

Correlation with market (ρ) = $\sqrt{0.8345}$ = 0.9135

Proportion of unsystematic risk $(1 - \rho^2)$ = 1 – 0.8345 = 0.1655

Appendix – II

Calculation of beta ( ) coefficient and other variables of NIBL

Fy	[R – E(R)]	[Rm – E(Rm)]	[R – E(R)] [Rm – E(Rm)]
2061/62	0.7522	0.1494	0.1124
2062/63	0.4575	0.2077	0.0950
2063/64	0.0954	0.6264	0.0598
2064/65	0.246	0.2668	0.1133
2065/66	-0.687	-0.3641	0.2501
2066/67	-0.7323	-0.504	0.3691
2067/68	-0.3103	-0.3822	0.1186
			1.1183

Data Source; Table No. 4.5 and 4.25

$Cov(R,Rm) = \sum [R – E(R)] [Rm – E(Rm)] / n – 1 = 1.1183/7 – 1 = 0.1860$

Beta Coefficient of NIBL ( ) $= Cov(R,Rm) / \sigma m^2 = 0.1860/0.1517 = 1.2287$

Calculation of alpha ( ) intercept

WE have,

Expected return of NIBLE(R) = 0.2617

Expected Return of Market E(Rm) = 0.1417

Now,

$\alpha = E(R) – \beta E(Rm)$

$= 0.2617 – 1.2287 \times 0.1417 = 0.0876$

Calculation of systematic risk and unsystematic risk

We have,

Variance or Total risk of NIBL (σ^2) = 0.3448

Variance of market (σm^2) = 0.1517

Total risk = Systematic risk + Unsystematic risk

$\sigma^2 = \beta^2 \sigma m^2 + e^2$

Systematic risk ($\beta^2 \sigma m^2$) = $(1.2287)^2$ x 0.1517 = 0.2290

Unsystematic risk (e^2) = Total risk – Systematic risk

= 0.3448 – 0.2290 = 0.1158

Coefficient of determination or proportion of systematic risk (ρ^2) and proportion of unsystematic risk (1 - ρ^2).

We have,

Proportion of systematic risk (ρ^2) = systematic risk / Total risk

= 0.2290 / 0.3440 = 0.6642

Correlation with market (ρ) = $\sqrt{0.6642}$ = 0.8150

Proportion of unsystematic risk (1 - ρ^2) = 1 – 0.6642 = 0.3358

Appendix – III

Calculation of beta (β) coefficient and other variables of BOK

Fy	[R – E(R)]	[Rm – E(Rm)]	[R – E(R)] [Rm – E(Rm)]
2061/62	-0.0696	0.1494	-0.0104
2062/63	0.9923	0.2077	0.2061
2063/64	0.2312	0.6264	0.1448
2064/65	0.8315	0.2668	0.2218
2065/66	-0.4177	-0.3641	0.1521
2066/67	-0.8947	-0.504	0.4509
2067/68	-0.5889	-0.3822	0.2251
			1.3904

Data Source; Table No. 4.12 and 4.25

$Cov(R,Rm) = \sum [R – E(R)] [Rm – E(Rm)] / n – 1 = 1.3904 / 7 – 1 = 0.2317$

Beta Coefficient of BOK (β) $= Cov(R,Rm) / \sigma m^2 = 0.1195/0.1261 = 1.5274$

Calculation of alpha (α) intercept

WE have,

Expected return of BOK E(R) = 0.41

Expected Return of Market E(Rm) = 0.1417

Now,

$\alpha = E(R) – \beta E(Rm)$

$= 0.7082 – 0.9473 \text{ x } 0.3189 = 0.1936$

Calculation of systematic risk and unsystematic risk

We have,

Variance or Total risk of BOK (σ^2) = 0.5094

Variance of market (σm^2) = 0.1517

Total risk = Systematic risk + Unsystematic risk

$$\sigma^2 = \beta^2 \, \sigma_m^2 + \sigma_e^2$$

Systematic risk ($\beta^2 \, \sigma_m^2$) = $(1.5274)^2$ x $0.1517 = 0.3540$

Unsystematic risk (σ_e^2) = Total risk – Systematic risk

= 0.5094 – 0.3540 = 0.1554

Coefficient of determination or proportion of systematic risk (ρ^2) and proportion of unsystematic risk ($1 - \rho^2$).

We have,

Proportion of systematic risk (ρ^2) = systematic risk / Total risk

$$= 0.3540 \, / \, 0.5094 = 0.6950$$

Correlation with market (ρ) = $\sqrt{0.6950}$ = 0.8337

Proportion of unsystematic risk ($1 - \rho^2$) = 1 – 0.6950 = 0.305

Appendix – IV

Calculation of beta ( ) coefficient and other variables of HBL

Fy	[R – E(R)]	[Rm – E(Rm)]	[R – E(R)] [Rm – E(Rm)]
2061/62	0.118	0.1494	0.0176
2062/63	0.0699	0.2077	0.0145
2063/64	0.7926	0.6264	0.4965
2064/65	0.1017	0.2668	0.0271
2065/66	-0.2279	-0.3641	0.0830
2066/67	-0.6773	-0.504	0.3414
2067/68	-0.1771	-0.3822	0.0677
			1.0478

Data Source; Table No. 4.15 and 4.25

Cov(R,Rm) = [R – E(R)] [Rm – E(Rm)] / n – 1 = 1.0478 /7 – 1 = 0.1746

Beta Coefficient of HBL ( ) = Cov(R,Rm) / σ_m^2 = 0.1746/0.1517 = 1.1510

Calculation of alpha ( ) intercept

WE have,

Expected return of HBL E(R) = 0.2529

Expected Return of Market E(Rm) = 0.1417

Now,

= E(R) – E(Rm)

= 0.2529 – 0.1510 x 0.1417 = 0.1631

Calculation of systematic risk and unsystematic risk

We have,

Variance or Total risk of HBL (^{2}) = 0.1999

Variance of market (σ_m^2)   = 0.1517

Total risk = Systematic risk + Unsystematic risk

^{2} = ^{2} σ_m^2 + e^2

118

Systematic risk ($\beta^2 \sigma m^2$) = $(1.1510)^2$ x 0.1517 = 0.1999

Unsystematic risk (e^2) = Total risk – Systematic risk

= 0.1999 – 0.1999 = 0

Coefficient of determination or proportion of systematic risk (ρ^2) and proportion of unsystematic risk (1 - ρ^2).

We have,

Proportion of systematic risk (ρ^2) = systematic risk / Total risk

$$= 0.1999 / 0.1999 = 1$$

Correlation with market (ρ) = $\sqrt{1}$ = 1

Proportion of unsystematic risk (1 - ρ^2) = 1 – 1 = 0

Appendix – V

Calculation of beta (β) coefficient and other variables of SBI

Fy	[R – E(R)]	[Rm – E(Rm)]	[R – E(R)] [Rm – E(Rm)]
2061/62	-0.3018	0.1494	-0.0451
2062/63	0.4339	0.2077	0.0901
2063/64	1.4133	0.6264	0.8853
2064/65	-0.1081	0.2668	-0.0288
2065/66	0.062	-0.3641	-0.0226
2066/67	-0.9855	-0.504	0.4967
2067/68	-0.5141	-0.3822	0.1965
			1.5721

Data Source; Table No. 4.21 and 4.25

Cov(R,Rm) = $\sum$ [R – E(R)] [Rm – E(Rm)] / n – 1 = 1.5721 /7 – 1 = 0.2620

Beta Coefficient of SBI (β) = Cov(R,Rm) / σm^2 = 0.2620/0.1517 = 1.7271

Calculation of alpha (α) intercept

WE have,

Expected return of SBI E(R) = 0.3930

Expected Return of Market E(Rm) = 0.1417

Now,

α = E(R) – β E(Rm)

= 0.3930 – 1.7271 x 0.1417 = 0.1483

Calculation of systematic risk and unsystematic risk

We have,

Variance or Total risk of SBI (σ^2) = 0.5880

Variance of market (σm^2)   = 0.1517

Total risk = Systematic risk + Unsystematic risk

$$\sigma^2 = \beta^2 \sigma_m^2 + \sigma_e^2$$

Systematic risk ($\beta^2 \sigma_m^2$) = $(1.7271)^2$ x $0.1517 = 0.1905$

Unsystematic risk (σ_e^2) = Total risk – Systematic risk

$= 0.5880 - 0.4525 = 0.1355$

Coefficient of determination or proportion of systematic risk (ρ^2) and proportion of unsystematic risk ($1 - \rho^2$).

We have,

Proportion of systematic risk (ρ^2) = systematic risk / Total risk

$$= 0.4525 / 0.5880 = 0.7696$$

Correlation with market (ρ) = $\sqrt{0.7696}$ = 0.8773

Proportion of unsystematic risk ($1 - \rho^2$) = $1 - 0.7696 = 0.2304$

Appendix – VI

Calculation of correlation between SCBNL and other sample Banks

We Know that

ρ_{AB} = Cov (R$_A$,R$_B$) / σ_A σ_B Cov (R$_A$,R$_B$) = [R$_A$ – E(R$_A$)] R$_B$ – E(R$_B$)] / n – 1

SCBNL & NIBL	SCBNL & BOK	SCBNL & HBL	SCBNL & SBI
0.037	-0.0034	0.0058	-0.0148
0.2532	0.5491	0.0387	0.2401
0.1074	0.2602	0.8920	1.5904
0.1346	0.2637	0.0322	-0.0343
-0.2072	-0.1260	-0.0687	0.0187
0.6784	0.8289	0.6275	0.9130
0.2536	0.4813	0.1447	0.4202
1.257	2.2538	1.6722	3.1333

Cov (R$_A$,R$_B$) = [R$_A$ – E(R$_A$)] R$_B$ – E(R$_B$)] / n – 1

Cov(SCBNL & NIBL) = 1.257 / 7 – 1 = 0.2095

P$_{AB}$ = 0.2095 / 0.7408 x 0.5872 = 0.4816

Cov(SCBNL & BOK) = 2.2538/ 7 – 1 = 0.3756

P$_{AB}$ = 0.3756 / 0.7408 x 0.7137 = 0.7104

Cov(SCBNL & HBL) = 1.6722 / 7 – 1 = 0.2787

P$_{AB}$ = 0.2787 / 0.7408 x 0.4471 = 0.8415

Cov(SCBNL & SBI) = 3.1333 / 7 – 1 = 0.5222

P$_{AB}$ = 0.5222/ 0.7408 x 0.7668 = 0.9193

Appendix – VII

Calculation of correlation between NIB and other sample Banks

We Know that

ρ_{AB} = Cov (R_A, R_B) / $\sigma_A \sigma_B$ Cov (R_A, R_B) = $[R_A - E(R_A)] R_B - E(R_B)]$ / n – 1

NIBL & BOK	NIBL & HBL	NIBL & SBI
-0.0524	0.0888	-0.2270
0.4540	0.0320	0.1985
0.0221	0.0756	0.1348
0.3531	0.0432	-0.0459
0.2870	0.1566	-0.0426
0.6552	0.4960	0.7217
0.1827	0.0550	0.1595
1.9017	0.9472	0.899

Cov (R_A, R_B) = $[R_A - E(R_A)] R_B - E(R_B)]$ / n – 1

Cov(NIBL & BOK) = 1.9017 / 7 – 1 = 0.3170

P_{AB} = 0.3170 / 0.5872 x 0.7137 = 0.7564

Cov(NIBL & HBL) = 0.9472 / 7 – 1 = 0.1579

P_{AB} = 0.1579 / 0.5872 x 0.4471 = 0.6014

Cov(NIBL & SBI) = 0.899 / 7 – 1 = 0.1498

P_{AB} = 0.1498/ 0.5872 x 0.7668 = 0.3327

Appendix – VIII

Calculation of correlation between BOK and other sample Banks

We Know that

P_{AB} = Cov (R_A, R_B) / $\sigma_A \sigma_B$ Cov (R_A, R_B) = $\sum [R_A – E(R_A)] R_B – E(R_B)]$ / n – 1

BOK & HBL	BOK & SBI
-0.0082	0.0210
0.0694	0.4306
0.1832	0.3268
0.0846	-0.0899
0.0952	-0.026
0.6060	0.8817
0.1043	0.3028
1.1345	1.847

Cov (R_A, R_B) = $\sum [R_A – E(R_A)] R_B – E(R_B)]$ / n – 1

Cov(BOK & HBL) = 1.1345 / 7 – 1 = 0.1891

P_{AB} = 0.1891 / 0.7137 x 0.4471 = 0.5926

Cov(BOK & SBI) = 1.847 / 7 – 1 = 0.3078

P_{AB} = 0.3078/ 0.7137 x 0.7668 = 0.5624

Appendix – IX

Calculation of correlation between HBL and other sample Banks

We Know that

$$P_{AB} = Cov\ (R_A, R_B)\ /\ \sigma_A\ \sigma_B \qquad Cov\ (R_A, R_B) = \sum [R_A - E(R_A)]\ R_B - E(R_B)] / n - 1$$

HBL & SBI
-0.0356
0.0303
1.1202
-0.0110
-0.0141
0.6675
0.0910
1.8483

$$Cov\ (R_A, R_B) = \sum [R_A - E(R_A)]\ R_B - E(R_B)] / n - 1$$

$$Cov(HBL\ \&\ SBI) = 1.8483 / 7 - 1 = 0.3081$$

$$P_{AB} = 0.3081 / 0.4471\ x\ 0.7668 = 0.8987$$

Appendix – X

Regression as Expected return E(R), depends on beta ( ).

S.N.	Sample Banks	Dependent Y	Independent X	XY	X^2
1	SCBNL	0.3634	1.7376	0.6314	3.0193
2	NIBL	0.2617	1.2287	0.3216	1.5097
3	BOK	0.41	1.5274	0.6262	2.3330
4	HBL	0.2529	1.1510	0.2911	1.3248
5	SBI	0.3930	1.7271	0.6788	2.9829
		1.681	7.3718	2.5491	11.1697

Data Sources: Table no. 4.26

The regression equation Y on X is

Y = a + bx

Where, Y = Expected return, E(R)

      X = Beta coefficient ( )

The required normal equation can be written as:

EY = na + bEX

$EXY = aEX + bEX^2$

Substituting the value is normal equation

1.681 = 5a + 7.3718b ……………….. (I)

2.5491 = 7.3718a + 11.1697b ………… (II)

By calculating equations (I) and (II) we can get value of

a =- 0.0101

b = 0.2349

Hence the regression equation Y on X is

Y = -0.0101 + 0.2349X

Now,

Analysis of Variance of Regression Line (ANOVA)

Sample	Y	$(Y-\bar{Y})$	$(Y-\bar{Y})^2$		$(\hat{Y}-\bar{\bar{Y}})$	$(\hat{Y}-\bar{\bar{Y}})^2$
SCBNL	0.3634	0.0272	0.0007	0.3981	0.0619	0.0038
NIBL	0.2617	-0.0745	0.0056	0.2785	-0.0577	0.0033
BOK	0.41	0.0738	0.0054	0.3487	0.0125	0.0002
HBL	0.2529	-0.0833	0.0069	0.2603	-0.0759	0.0058
SBI	0.3930	0.0568	0.0032	0.3956	0.0594	0.0035
Total	1.681		0.0218	1.6812		0.0166

$\bar{Y}$ = EY /n = 1.681/5 = 0.3362

Here,

Total variation = SST = $E(Y-\bar{Y})^2$ = 0.0218

Expected variation = SSR = $E(\hat{Y}-\bar{\bar{Y}})^2$ = 0.0166

Unexpected variation = SSE = SST – SSR = 0.0218 – 0.0166 = 0.0052

Hypothesis Formulation

H0: b = 0, i.e. the regression equation of Y on X is not significant. In other words, there is no relationship between dependent variable Y and independent variable X.

H1: b ≠ 0 i.e the regression equation of Y on X is significant. In other words, there is relationship between dependent variable Y and independent variable X.

Test Statistic:

Under H0, the test statistic is

F = MSR/ MSE

ANOVA Table

Sources of Variance	Sum of Squares	Degree of Freedom (d.f.)	Mean Sum of Square	F. Ratio
Explained Variation	SSR = 0.0166	K – 1 = 2 – 1 = 1	MSR = SSR/K-1 =0.0166/1=0.0166	=MSR/MSR
Unexpected Variation	SSE= 0.0052	N-k =5-2=3	MSR=SSE/N-k =0.0052/3=0.0017	=0.0166/0.0017 = 9.7647
Total Variation	SST = 0.0218	N-1 = 5 – 1 = 4		

The critical value of F at 5% level of significance for degree of freedom (1,3) is 10.1. Since the calculated value of 'F' is less than tabulated value. The regression equation of Y on X is not significant and accepts H0 which means that the regression equation of dependent variable Y and independent variable X is not significant. In other words, there is not linear ship between the dependent variable and independent variable..

Coefficient of Determination (R^2x,y) = SSR/SST = 0.0166/0.0218 = 0.7615

Appendix – XI

Regression as Expected return E(R), depends on beta ( ) and correlation with Market ( )

S.N.	Sample Banks	X_2	YX_1	X_1X_2	X^2_2	YX_2	X_1^2
1	SCBNL	0.9135	0.6314	0.5873	0.8345	0.3320	3.0193
2	NIBL	0.8150	0.3216	1.0014	0.6642	0.2133	1.5097
4	BOK	0.8337	0.6262	1.2734	0.6951	0.3418	2.3330
5	HBL	1	0.2911	1.1510	1	0.2529	1.3248
7	SBI	0.8773	0.6788	1.5152	0.7697	0.3448	2.9829
		4.4395	2.5491	5.5283	3.9635	1.4848	11.1697

Data Sources: Table No. 4.35

The regression equation Y on X_1 and X_2 is

$Y = a + b_1X_1 + b_2X_2$

Where Y = Expected return E(R)

X_1 = Beta Coefficient ( )

X_2 = Correlation coefficient with market ( )

The required normal equation can be written as:

$Y = na + b_1 \ X_1 + b_2 \ X_2$

$YX_1 = aEX_1 + b_1 \ X_1^2 + b_2 \ X_1X_2$

$YX_2 = a \ X_2 + b_1 \ X_1X_2 + b_2 \ X^2_2$

Substituting the values in normal equations:

$1.681 = 5a + 7.3718b_1 + 4.4395b_2$ ……………. (I)

$2.5491 = 7.3718a + 11.1697b_1 + 5.5283b_2$ …….. (II)

$1.4848 = 4.4395a + 5.5283b_1 + 3.9635b_2$ ……. (III)

By calculating equation (I),(II) and (III), we get value of

a = 0.3872

$b_1 = 0.0062$

$b_2 = -0.0677$

Hence the regression equation Y on X_1 and X_2 is

$Y = 0.3872 + 0.0062X_1 - 0.0677X_2$

Analysis of Variance of Regression Line (Test of Regression Coefficient of Regression Line)

Sample	Y	(Y-)	(Y-)^2		(- $\overline{\overline{Y}}$)	(- $\overline{\overline{Y}}$)^2
SCBNL	0.3634	0.0272	0.0007	0.3361	-0.0001	0.0000
NIBL	0.2617	-0.0745	0.0056	0.3396	0.0034	0.00001
BOK	0.41	0.0738	0.0054	0.3402	0.0004	0.0000
HBL	0.2529	-0.0833	0.0069	0.3266	-0.0096	0.00009
SBI	0.3930	0.0568	0.0032	0.3385	0.0083	0.0000
Total	1.681		0.0218			0.0001

$= Y/n = 1.681/5 = 0.3362$

Here,

Total variation $= SST = (Y-)^2 = 0.0218$

Expected variation $= SSR = (- \overline{\overline{Y}})^2 = 0.0001$

Unexpected variation $= SSE = SST - SSR = 0.0218 - 0.0001 = 0.0217$

Y on X_1 and X_2 is

$Y = a + b_1X_1 + b_2X_2$

Where,

Y = Expected return E(R)

X_1 = Coefficient of beta ( )

X_2 = Correlation coefficient with market ( )

Hypothesis Formulation

H0: $b_1 = b_2 = 0$, i.e. the regression equation of Y on X_1 and X_2 is not significant. In other word, there is no relationship between dependent variable Y and two independent variable X_1 and X_2.

H_1: $b_1 \neq b_2 \neq 0$, i.e the regression equation of Y on X_1 and X_2 is significant. In other words, there is relationship between dependent variable Y and two independent variable X_1 and X_2. Test statistic under H0 the test statistic is

F = MSR/ MSE

ANOVA Table

Sources of Variance	Sum of Squares	Degree of Freedom (d.f.)	Mean Sum of Square	F. Ratio
Explained Variation	SSR = 0.0001	K – 1 = 3 – 1 = 2	MSR = SSR/K-1 =0.0.0001/2=0.00005	=MSR/MSE
Unexpected Variation	SSE= 0.0217	N-k =5-3=2	MSE=SSE/N-k =0.0217/2=0.0109	=0.00005/0.0109 = 0.0046
Total Variation	SST = 0.0218	N-1 = 5 – 1 = 4		

The critical value of 'F' at 5% level of significance for degree of freedom (2,2) is 19.0. Since calculated value of 'F' is less than the tabulated value of 'F'. It is not significant and accepts H0, which means that the regression equation of dependent variability on two independent variables X_1 and X_2 is not significant. In other words, there is no linear ship between the dependent variables Y and two independent variables X_1 and X_2.

Coefficient of determination (R^2 y,x) = SSR/SST = 0.0001/0.0218 = 0.0045